

REPORT

OF

THE COMMISSIONERS

APPOINTED TO INQUIRE INTO

THE CONDITION AND MANAGEMENT OF
LIGHTS, BUOYS, AND BEACONS;

WITH

APPENDIX AND INDEX.

VOL. II.

Presented to both Houses of Parliament by Command of Her Majesty.



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FOR HER MAJESTY'S STATIONERY OFFICE.

1861.



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VOL. II

1st.—CIRCULARS ISSUED BY THE COMMISSION, I. to XI.

These contain the questions to which the returns printed in the Appendix of Vol. II., are replies, and are a key to the whole

Opposite to the questions references are given to the pages where the replies may be found. Some abstracts are given, and other information is added.

Each reply is numbered to correspond to the question to which it is an answer.

Example 1.—It is desired to know what is the description of illuminating apparatus at any lighthouse—under any of the General Authorities—

Open out Circular III., and the Question will be found as (No. 21) XXI.

Search in the map for the number of the Lighthouse in question; say No. 1 Fern, in England.

Search for No. 1. under the heading—Circular No. III., England, and the information will be found, Vol. II. p. 65, opposite to the No. XXI., and the same information for every Lighthouse will be found opposite to the same Number,—XXI.

Example 2.—It is desired to know the opinion of John Smith, Mariner, as to the best shapes and colours for buoys.

Open out Circular VIII., Mariners' Questions, and the question which elicited the information will be found opposite to —No. 17.

Search for Smith's number in the alphabetical list of Mariners, page 466, and opposite to his name is the number 292.

Look for 292, under the heading—Question 17, Mariners' Evidence, page 526, and the evidence of John Smith on this point will be found:

“292. The nun buoys, black or red, are best seen at night.”

Example 3.—It is desired to know what is the bearing of the evidence given on the same point by the whole of the witnesses.

Look to the Abstract, page 587, and the result of the evidence of 657 witnesses will be found opposite to Question 17, which elicited the information.

Example 4.—Information is wanted relative to a Local Authority; say Liverpool.

Search for the question in the Circulars, and for the name of the Local Authority under letter L, and under the heading—Local Authorities, England; and the answer to the question will be found under the Marginal Heading, and the number of the Circular, and of the Question, page 326.

Example 5.—The opinion of a Scientific Witness is wanted on any point raised by a question in Circulars IX., and X.

Search for his name, in the list on the Circular, and his evidence will be found under the number of the question.

Example 6.—Information is wanted as to some foreign country.

In Circular XI. search for the name of the country and for the question, and look to the return under the number of the question for the answer.

GENERAL AUTHORITIES.

Trinity House, England.	Commissioners of Northern Light- houses, Scotland.	Ballast Board, Dublin.	Replies to Circular.
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55 — 64	163 — 172	225 — 227	II. General Lighthouse Return.
65 — 106	173 — 188	228 — 262	III. Special Lighthouse Returns.
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279. LOCAL AUTHORITIES.

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 285—424. Replies to Circulars II., III., IV., V., VI., and observations made by the Commissioners relative to Lights, Buoys, and Beacons, &c. under Local Authorities. These are alphabetically arranged in three groups under—England,—Scotland,—Ireland.

425. MERCANTILE MARINE EVIDENCE.—Circular VII.

425. Alphabetical list and index number of each witness.
 426—442. Evidence. All the answers printed under each question.
 443—444. Abstract.

445. MARINERS' EVIDENCE.—Circular VIII.

446. Alphabetical list and index number of each witness.
 449—578. Evidence arranged as above.
 579—585. Appendix.
 586. Abstract.

589. EVIDENCE OF SCIENTIFIC WITNESSES.—Circulars XI. X.

- 589—630. Evidence arranged under the name of each witness in the form in which it was given.

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- 631—637. Correspondence with Board of Trade.
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 638—643. Circular III. Special Lighthouse Returns.
 643—650. Evidence of Alexander Gordon, Esq. C.E.
 650. Circular XII., and replies thereto.

FOREIGN COUNTRIES.

Replies to Circular XI.

651. United States of America.
 655. Turkey.
 656. Norway.
 959. Sweden.
 661. Hanover.
 662. Hamburgh.
 665. Spain.
 669. France.
 676. Denmark.
 682. Russia.
 683. Holland.
 687. Belgium.
 688. Austria.

MISCELLANEOUS.

690. A Local Return.—Northfleet.
 691. A Mariner's reply.—Peter Dodd.
-

QUESTIONS

ISSUED BY

TRINITY HOUSE COMMISSION.

RETURN OF LIGHTHOUSE AUTHORITIES—BUSINESS—STAFF—
EMPLOYED IMPROVEMENTS.

RETURN—LIGHTHOUSES AND FLOATING LIGHTS.

RETURN—LIGHTHOUSES.

RETURN—FLOATING LIGHTS.

AND BEACONS.

AS CIRCULATED THROUGH LLOYD'S AGENTS.

„ AMONGST THE MERCANTILE MARINE.

„ „ MARINERS.

„ „ SCIENTIFIC MEN AND MANUFACTURERS.

SENT TO FOREIGN COUNTRIES.

CIRCULAR No. I.

FROM THE GENERAL LIGHTHOUSE AUTHORITIES
OF THE TRINITY HOUSE COMMISSION.

INSTRUCTIONS, BUSINESS, STAFF, &c.

These questions correspond as far as possible with similar Numbers on the Returns
made by the several Authorities.

Questions are intended to lie open like a Map, and must be bound at the
Trinity House for England.

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No. II.

BY THE LIGHTHOUSE COMMISSION TO THE
HOME AUTHORITIES.

ES AND FLOATING LIGHTS.

GENERAL RETURNS.

correspond to similar Numbers in the Returns made by the several
Authorities.

ich the Replies to this Circular are given.

LIGHTHOUSES.

LOCAL AUTHORITIES.

Places.	England.	Scotland.	Ireland.	Colonial.
Belfast	- - - - -	- - - - -	399	637
Clyde	- - - - -	376	-	-
Cumbrae	- - - - -	377	-	-
Dundee	- - - - -	383	-	-
Hull	312	-	-	-
Isle of Man	341	-	-	-
Liverpool	326	-	-	-
Londonderry	- - - - -	- - - - -	412	-
Maryport	345	-	419	-
Newcastle - upon - Tyne	347	-	-	-
Poole	352	-	-	-

FLOATING LIGHTS.

Liverpool	334	-	-	-
Hull	316	-	-	-

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No. III.

UED BY THE LIGHHOUSE COMMISSION TO THE
HOME AUTHORITIES.

L I G H T H O U S E S .

SPECIAL RETURN.

bers correspond to similar Numbers in the Returns made by the several
Authorities.

* Circular will be found.

	Scotland.	Ireland.	Colonial.
	—	—	638
	73 to 188	—	—
	—	228 to 262	—
	372	399 to 423	—
	—	—	—
	—	—	—
	—	—	—
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	—	—	—
	—	—	—
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[1.]	—	—	—
[2.]	—	—	—
[3.]	374	—	—
[4.]	374	—	—
[5.]	375	—	—
[6.]	375	—	—
[7.]	—	399	—
[8.]	375	—	—
[9.]	—	—	—
[10.]	—	—	—
[11.]	377	—	—
	378	—	—
[12.]	—	404	—
[13.]	—	—	—
[14.]	—	—	—
[15.]	385	—	—
[16.]	—	406	—
[17.]	—	407	—
[18.]	390	—	—
	391	—	—
[19.]	424	—	—
[20.]	—	—	—
[21.]	—	—	—
[22.]	—	—	—
[23.]	—	—	—
	391	—	—
[24.]	391	—	—
[25.]	392	—	—
[26.]	—	—	—
[27.]	?	—	—
[28.]	X	—	—
[29.]	—	—	—
[30.]	—	—	—
[31.]	—	410	—
[32.]	—	413	—
[33.]	X	—	—
	—	—	—
[34.]	X	392	—
	—	392	—
[35.]	?	—	—
[36.]	X	—	—
[37.]	X	—	—
	—	—	—
[38.]	XX	—	—
[39.]	X	—	—
[40.]	—	—	—
[41.]	—	393	—
[42.]	—	394	—
[43.]	—	395	—
[44.]	—	—	—
[45.]	—	—	—
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[46.]	—	—	—
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[48.]	?	—	—
	—	—	—
[49.]	—	—	—
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[50.]	—	—	—
[51.]	—	395	—
[52.]	—	395	—
	—	395	—
[53.]	—	396	—
[54.]	—	—	—
[55.]	—	—	—
	—	396	—
[56.]	—	—	—
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[57.]	—	—	—
[58.]	—	—	—
	—	—	—
	N	—	—
	—	397	—
	—	399	—

No. IV.

BY THE LIGHTHOUSE COMMISSION TO THE
HOME AUTHORITIES.

O A T I N G L I G H T S.

SPECIAL RETURN.

correspond to similar Numbers in the Returns made by the several
Authorities.

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as Circular will be found.

	Scotland.	Ireland.
31		
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42	—	—
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44	—	—
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48	—	—
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51 Circular VI.

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No. V.

ED BY THE LIGHTHOUSE COMMISSION TO THE
HOME AUTHORITIES.

OYS AND BEACONS.

bers correspond to similar Numbers in the Returns made by the several
Authorities.

which the Replies to this Circular will be found.

England.	Ireland.	Local Authorities—cont.	England.	Scotland.	Ireland.
—	—	Lancaster - - -	324	—	—
—	—	Littlehampton - - -	325	—	—
9 to 201	—	Liverpool - - -	338	—	—
—	—	Lowestoft - - -	340	—	—
—	267 to 274	Lyme Regis - - -	340	—	—
—	—	Limerick - - -	—	—	411
372	399 to 423	Londonderry - - -	—	—	415
—	—	Maldon - - -	341	—	—
V —	—	Montrose - - -	—	393	—
—	—	Musselburgh - - -	—	393	—
VI 372	—	Newport - - -	349	—	—
I 373	—	Neath - - -	346	—	—
—	—	Newcastle-upon-Tyne - - -	348	—	—
—	—	Newhaven - - -	349	—	—
—	—	Pembroke - - -	287	—	—
—	—	Plymouth - - -	287	—	—
—	—	Portsmouth - - -	290	—	—
—	—	Port Patrick - - -	289	—	—
—	—	Padstow - - -	349	—	—
—	—	Penzance - - -	350	—	—
374	—	Poole - - -	351	—	—
374	—	Porthcawl - - -	353	—	—
374	—	Porthreath - - -	354	—	—
375	—	Pwllheli - - -	354	—	—
375	—	Perth - - -	—	393	—
X —	401	Ramsgate - - -	354	—	—
XI —	—	Ribble - - -	355	—	—
—	—	Rye - - -	356	—	—
XII 375	—	Sheerness - - -	290	—	—
XI —	—	Southampton - - -	359	—	—
X —	—	Southwold - - -	360	—	—
XV 377	—	Spalding - - -	360	—	—
379	—	Sunderland - - -	364	—	—
XVI —	402	St. David's - - -	—	395	—
—	404	St. Margaret's - - -	—	395	—
—	—	Stonehaven - - -	—	396	—
389	—	Stornoway - - -	—	396	—
XVII —	406	Sligo - - -	—	—	416
390	—	Strangford - - -	—	—	417
—	—	Talbot Port - - -	365	—	—
XI —	—	Teignmouth - - -	366	—	—
X 391	—	Troon - - -	—	397	—
XX 391	—	Ulverstone - - -	367	—	—
—	—	Woolwich - - -	391	—	—
XX —	408	Weymouth - - -	367	—	—
XXI —	—	Wing (Ilfracombe) - - -	369	—	—
—	—	Wisbech - - -	369	—	—
XXI —	—	Workington - - -	371	—	—
—	—	Wick - - -	—	398	—
—	—	Witham - - -	—	398	—
391	—	Waterford - - -	—	—	418
391	—	Westport - - -	—	—	420
—	—	Wexford - - -	—	—	420
392	—	Youghal - - -	—	—	421
—	—				

No. VI.

ED BY THE LIGHTHOUSE COMMISSIONERS TO
LLOYD'S AGENTS, &c.

ced after the several Returns made by the General and Local Authorities
er the Lights, Buoys, and Beacons to which the Evidence relates.

together with other evidence, the HOUSE AUTHORITY having to, or under the name of the ce applies to a place under local

Pages at which the Replies to this Circular will be found.

III

e Return ;
Northern Lights ;

Authorities to which they apply,

OF THE ANSWERS.

I persons known to them.

II named, once or more.

III Authorities named (see Map).
to districts under the General
authorities.

IV variable.
variable.

V
ments in { Lights 23
Buoy 29
Beacons 18

VI { Lights 51
Buoy 33
Beacons 22

VII
combustibles—Gas - 115
" Tallow - 45

VII " Electric light 1

ents (to lights).
ents (to ships).

ents (to buoys).
ents (to ships).

ent of { Lights 39
Buoy 31
Beacons 22

als.

X wanted.

als.

XI wanted.

-colour { Black and red 47
Black - 42
Red - 22
White - 9
Cone - 21
Can - 12
form { Nun - 7
Square - 3
Barrel - 2

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	England.	Scotland.	Ireland.
GENERAL AUTHORITIES:—			
Trinity House - - - -	146 to 152	—	—
Commissioners of North- ern Lighthouses.	- - -	201 to 208	—
Ballast Board - - - -	- - -	- - -	275 to 276
LOCAL AUTHORITIES:—			
Admiralty - - - -	285	372	399 to 423
Aberdovey - - - -	286	—	—
Albro' - - - -	285	—	—
Alderney - - - -	291	—	—
Amble - - - -	292	—	—
Ayr - - - -	292	—	—
Barmouth - - - -	—	274	—
Barrow - - - -	292	—	—
Beaumaris - - - -	293	—	—
Berehaven - - - -	293	—	—
Blyth - - - -	286	—	—
Boston - - - -	296	—	—
Bridport - - - -	297	—	—
Bridgewater - - - -	298	—	—
Belfast - - - -	297	—	—
Carnarthen - - - -	—	—	402
Cardiff - - - -	298	—	—
Carlisle - - - -	300	—	—
Caledonian Railway Com- pany. - - - -	301	—	—
Clyde - - - -	—	376	—
Carlingford - - - -	—	377	—
Cork - - - -	—	—	403
Hartmouth - - - -	—	—	405
Dover - - - -	302	—	—
Dumfries - - - -	305	—	—
Dundee - - - -	—	383	—
Donegal - - - -	—	390	—
Drogheda - - - -	—	—	406
Dundalk - - - -	—	—	406
Elgin - - - -	—	390	408
Fowey - - - -	306	—	—
Goole - - - -	307	—	—
Guernsey - - - -	309	—	—
Hartlepool - - - -	312	—	—
Hull - - - -	316—320	—	—
Jersey - - - -	322	—	—
Isle of Man - - - -	345	—	—
Kirkwall - - - -	—	392	—
Kenmare - - - -	—	—	410
Llandwyn - - - -	299	—	—
Llanely - - - -	325	—	—
Limerick - - - -	—	—	411
Littlehampton - - - -	325	—	—
Londonderry - - - -	—	—	416
Neath - - - -	246	—	—
Newbiggin - - - -	346	—	—
Newcastle-upon-Tyne - - - -	348	—	—
Padstow - - - -	350	—	—
Penzance - - - -	351	—	—
Poole - - - -	353	—	—
Porthawl - - - -	353	—	—
Peterhead - - - -	—	394	—
Ribble - - - -	355	—	—
Rye - - - -	356	—	—
Sheerness - - - -	291	—	—
Saltash - - - -	357	—	—
Saundersfoot - - - -	357	—	—
Scarborough - - - -	358	—	—
Southampton - - - -	359	—	—
St. Ives - - - -	361	—	—
Sunderland - - - -	365	—	—
Talbot Port - - - -	365	—	—
Teignmouth - - - -	366	—	—
Troon - - - -	—	397	—
Wells - - - -	367	—	—
Weymouth - - - -	367	—	—
Whitby - - - -	368	—	—
Whitstable - - - -	368	—	—
Wing (Ilfracombe) - - - -	369	—	—
Waterford - - - -	—	—	419
Wexford - - - -	—	—	421
Youghal - - - -	—	—	422

No. VII.

MISSION ON LIGHTHOUSES, &c.

RELATED AMONGST THE MERCANTILE
MARINE.

Pages where
the questions
and answers
will be found
together.

I		ABSTRACT.	
			1 426
separate localities, namely, Aberdeen, 3; Ardrrossan, 1; Belfast, 1; Bristol, 1; Bridgewater, 1; Boston, 1; Clyde, 10; Cork, 2; Dundee, 4; Dublin, 2; East Coast and English Channel, 1; Falmouth, 2; Frith of Forth, 2; Greenock, 1; Glasgow, 1; Hull, 5; Harwich, 2; Hartlepool, 1; Jersey, 2; Liverpool, 3; London, 3; Leith, 2; Milford Haven, 1; Newport, 1; Newcastle-upon-Tyne, 2; Orkney, 1; Plymouth, 6; Padstow, 1; Sunderland, 5; St. Helier and Bay of St. Aubyn, 1; Shields, 3; Swansea, 2; Sligo, 1; Solway Frith, 1; Tyne, 1; Tenby, 1; Whitby, 1; localities.		2 426	
Authorities General Authorities.			3 429
			4 430
			5 430
localities in which local dues are levied, namely:--- Dundee, Milford Haven, Shields, South. Falmouth, Newcastle-on-Tyne, Sunderland. Ilfracombe, Plymouth, Stockton. Liverpool, Shields, North.			6 432
of which no abstract can be made.			7 433
			8 434
objections and mention cases			9 435
uses of improper application of funds			10 436
			11 437
uses			12 439
visions			13 440

No. VIII.

COMMISSION ON LIGHTHOUSES, &c.

COPYES CIRCULATED AMONGST MARINERS.

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34. If you c
35. Be so g
36. Date at

Nos. IX. and X.

MISSION ON LIGHTHOUSES, &c.

ED TO SCIENTIFIC MEN, MANUFACTURERS, &c.

now used or proposed for buoys do you think best for riding in all weathers tides and heavy seas, with the least possible strain on the moorings, and do you suggest any improvement in the form of buoys, or the method of

you recommend for sheltered situations?

the method of rendering buoys luminous at night?

Is any system generally applicable for buoying coasts, harbours, rocks, shoals, in the absence of pilots, and without the aid of a chart, vessels might be safely steered to describe it, and to state whether it is applicable to buoys now in use.

ACOUSTICS.

THE

most capable of penetrating a fog? What method do you consider best for

you recommend as the most serviceable?

(If guns are used, as also reflectors and other contrivances for directing and concentrating sound, or for throwing it in particular directions? Do you

enable mariners to distinguish with sufficient certainty the direction from which a

signal is placed, so as to be heard at the greatest possible distance?

METEOROLOGY.

Would it be desirable that lights should generally be placed on the coasts of the country, viz., the higher the light the greater the distance to which the light is visible above the horizon? The lower the light the less likely it is to be obscured

by certain lighthouses and light-vessels at salient points of the coast, what would be the most desirable to transmit to passing ships, and how and in what manner received and communicated by light-keepers?

Do you recommend for general adoption in connexion with lighthouses at the mouth of a river, the state of the tide by day and by night, to persons in the offing?

(Including balls, flags, coloured lights, illuminated figures moved by the tide, &c.,

and any good system for identifying lighthouses and floating lights by day? and what is the system now used for identifying them by night?

CIRCULAR No. X.

TO LIGHTHOUSE ENGINEERS, MANUFACTURERS, &c.—No. II.

Commissioners would be greatly obliged to you for any replies that you may be

Y

1 am, &c.

(Signed) J. F. CAMPBELL, *Secretary.*

the mode of constructing dioptric and catadioptric illuminating apparatus for use in all cases informed on receiving an order:

1. The position of the apparatus at the sea at which it is intended to place the light? and—

2. The height to be illuminated?

3. The efficiency of the apparatus that this information should be furnished to the makers of prisms, &c., are made and ground, and before they are finally adjusted in their ultimate position with reference to the lamp is decided on?

4. From which angles required for constructing an apparatus to illuminate a light, placed at a given elevation, could be readily calculated by the manufacturer the order?

5. Are the tables now furnished by lighthouse authorities to the makers of illuminated apparatus

A list of the following Witnesses will be found:—

X	Page	Page	Page
Gladstone, G.	- 613	9. Potter, R.	- 597
Henwood, W.	- 600	14. Rankine, W. J. M.	- 599
XI Herschel, Sir J. F. W.	- 593	42. Renton, A. H.	- 618
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Maury, M. F.	- 624	4. Smyth, C. P.	- 591
Miller, G. A.	- 598	23. Stevenson, A.	- 606
Miller, W. H.	- 609	24. Stevenson, T.	- 607
Milne, J.	- 591	76. Vannet, M. F. C.	- 615
Moigno, Lt. Abb.	- 603	21. Ville, De, and Co.	- 606
Napier, J. R.	- 608	20. Wilkins, W.	- 605
Parks, M. T.	- 616		

REPLIES TO CIRCULARS ISSUED BY THE LIGHTHOUSE COMMISSION.

CIRCULAR No. 1.

ENGLAND.

The numbers in the margin correspond with the numbers of the Questions in Circular I.

CONSTITUTION OF GENERAL LIGHTHOUSE AUTHORITY.

I.

RETURN TO REQUISITION, dated 27th May 1859.

QUESTION 1. "RULES AND REGULATIONS now in force for the admission of Younger Brethren, and the Election of Elder Brethren."

RULES AND REGULATIONS in relation to the admission of Younger Brethren and the Election of Elder Brethren of the Corporation of Trinity House of Deptford Strond.

At a Court held on Thursday, 12th February 1835,—

It was Resolved, That all Regulations which have been at any time established respecting the qualifications and admission of Younger Brethren and Candidates, and the qualification and election of Elder Brethren, be rescinded, and that the following Regulations be established in lieu thereof; viz.—

That any person desirous of becoming a Younger Brother shall be admissible at the pleasure of the Court, upon the proposition of any one Elder Brother, and without ballot, as heretofore.

That the Thirty-one Elder Brethren shall consist of not less than Twenty Persons, bred in the maritime service of the United Kingdom, who shall be deemed the acting Elder Brethren; and the remainder of either Ministers of State, Naval Officers of high rank, or other distinguished characters, who shall be considered Honorary Brethren, and not required to take active part in the discharge of the duties of the Corporation, although not restricted from so doing, should it be their pleasure to attend the Courts or Boards.

That any Younger Brother desirous of being admitted a candidate for the situation of a Maritime Elder Brother, shall, on notifying the same to the Deputy Master or other Member of the Court, be questioned as to his eligibility, by maritime service, to be elected an Elder Brother; which having been ascertained, the proposition for his admission to the List of Candidates may be made to the next Monthly Court, when the proposer and seconder shall declare that, to the best of their knowledge and belief, the person proposed is strictly eligible according to the regulations hereafter stated, so far as they relate to maritime service; and at the ensuing Monthly Court a ballot shall be taken upon that proposition.

That no Younger Brother shall be eligible to be placed upon the List of Candidates to fill the office of an Elder Brother in room of any of the Maritime Members, who shall not have attained the rank of Commander in His Majesty's Navy for at least four years previously, and have served as such afloat during part of that time, or shall not have served as Master in the Merchant service on foreign voyages for at least four years.

That no candidate shall be eligible to be elected an Elder Brother, on a vacancy occasioned by the death, resignation, removal, or otherwise, of either of the Maritime Members, who shall at the time be in the command of a vessel in His Majesty's Navy, or who, having been admitted a candidate from the Merchant service, shall be in the command of a merchant vessel, or shall at the time hold any commission or warrant in His Majesty's Navy, or shall be in the employ of any public body, corporation, department, or individual

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whatsoever (except as director or member), or in any way under the control of the same, nor if he be at the time a broker, wharfinger, or shopkeeper.

That if any of the Maritime Members shall accept either of a command in His Majesty's Navy, or shall take the command of or any situation in a merchant vessel, or shall accept of any appointment under any public body, corporation, department or individual whatsoever, so as to be under the control of the same (except as a director or member), or shall become a broker, wharfinger, or shopkeeper, he shall be considered to have fallen within the terms of the charter, which provide for the displacing of Elder Brethren, and shall be displaced accordingly; and the Elder Brethren shall thereupon proceed to a new election in the manner herein-after provided, and shall elect either the person so displaced or any other who shall be eligible, according to the foregoing regulations.

That on the death, resignation, or removal of any Elder Brother, the vacancy thereby occasioned shall be notified at the next Monthly or Special Court, when it shall be determined whether the vacancy shall be filled by an Honorary or by an Acting Member, and a time appointed for a Special Court to be convened for the election of a successor, at such interval as shall allow of ten days' notice thereof being given.

That at the Court convened for the election of an Elder Brother, if it shall have been resolved to fill the vacancy by an Honorary Brother, the election shall be made by the majority of voices of the Elder Brethren present; but if it shall have been resolved that the successor shall be chosen from the maritime service, to take active part in the discharge of the duties of the Corporation, then the book containing the List of Candidates shall be handed by the Secretary to each Member present, beginning with the junior, who shall make one scratch against the name of each of three eligible candidates; and the names of the three candidates which shall have the greatest number of scratches, shall be placed on the balloting box and be balloted for, and whoever has the greatest number of balls, provided such number be that of the majority of the Brethren present, shall be by the Master or his Deputy declared duly elected; but if the balls are so divided that such majority is not given to either of the three, then the names of those two who shall have the greatest number shall be again placed on the box and balloted for, and whoever has the greatest number of balls shall be in like manner declared by the Master or his Deputy duly elected; whereupon the Court shall be adjourned to a subsequent day, upon which the Elder Brother so elected shall attend to be sworn, and to take his seat at the Board. But if in this proceeding it be found that the balls are divided in equal numbers, either upon the first, as regards three, or upon the second ballot as regards two, the Master or his Deputy shall adjourn the Court to a future day, when the ballot shall be renewed, and the election made in the manner herein-before directed.

J. HERBERT, Secretary.

P. H. BERTHON,
Secretary.

Trinity House, London,
16th December, 1859.

ENGLAND
Circular I
Question 1.

APPENDIX—LIGHTS, BUOYS, AND BEACONS :

CONSTITUTION OF GENERAL AUTHORITY, &c.

RETURN to REQUISITION, dated 27th May 1859.

ENGLAND.
Circular I.
Question II.

II. & III.

II. & III.

(Question II.)—NAMES, RANK, and PROFESSION of the present Members of the TRINITY HOUSE BOARD OF DEPTFORD STROND, distinguishing the Honorary from the Acting Members, and proximate Age of each at Time of Election, with the Dates of their Admission to the List of Younger Brethren, and Length of Time on that List before being elected an Elder Brother.

Names.		Rank and Profession when elected.	Date of Election.	Proximate Age of each at Time of Election.	Date of Admission to List of Younger Brethren.	Length of Time on List of Younger Brethren before being elected an Elder Brother.
Honorary.	Acting.					
Sir J. R. G. Graham, Bart.	Charles Weller	A retired Commander in the Merchant Sea Service.	12 April 1834	52	3 June 1824	10 years.
	Frederick Madan	A Privy Councillor	6 Nov. 1834	—	6 Nov. 1834	—
His Royal Highness the Prince Consort.	Frederick Madan	A retired Commander in the Merchant Sea Service.	19 Dec. 1837	40	4 Feb. 1830	8 "
	William Pixley	His Royal Highness the Prince Albert, R.G.	27 Feb. 1841	—	27 Feb. 1841	—
Marquis of Dalhousie	William Pixley	A retired Commander in the Merchant Sea Service.	10 Mar. 1841	53	2 April 1829	12 "
	Charles Farquharson, Lieut. R.N.	Iditto	19 Sept. 1843	49	3 Sept. 1839	4 "
	Robert Gordon	A Captain in the Royal Navy	19 Sept. 1843	47	3 Sept. 1835	8 "
	William Elisha Farrer	A retired Commander in the Merchant Sea Service.	19 Dec. 1843	48	3 Dec. 1835	8 "
Lord John Russell	Henry Bonham Bax	Iditto	16 Jan. 1844	47	1 Dec. 1831	12 "
	Gabriel Jemmett Redman	Earl of Dalhousie, President of the Board of Trade.	8 June 1846	—	8 June 1846	—
Lord Taunton	John Fulford Owen	A retired Commander in the Merchant Sea Service.	25 May 1847	47	12 Nov. 1822	24 "
	William Pigott	First Lord of the Treasury	7 Feb. 1849	—	7 Feb. 1849	—
Sir Francis T. Baring, Bart.	John Fulford Owen	A retired Commander in the Merchant Sea Service.	5 Feb. 1850	46	7 Nov. 1843	6 "
	Henry Shuttlesworth James Drew	The Rt. Hon. Henry Labouchere, President of the Board of Trade.	20 Aug. 1850	—	20 Aug. 1850	—
The Earl of Derby	Henry Shuttlesworth James Drew	A retired Commander in the Merchant Sea Service.	29 Aug. 1850	49	6 July 1847	3 "
	Thos. Narramore Werc	Iditto	28 Jan. 1851	47	4 Oct. 1842	8 "
The Earl of Aberdeen	Thos. Narramore Werc	Iditto	3 June 1851	36	2 July 1844	7 "
	Richd. Wilson Pelly	First Lord of the Admiralty.	23 Dec. 1851	—	23 Dec. 1851	—
The Earl of Dundonald	Richd. Wilson Pelly	A retired Commander in the Merchant Sea Service.	23 Dec. 1851	45	6 Feb. 1844	8 "
	Mark Currie Close	First Lord of the Admiralty.	2 Nov. 1852	—	2 Nov. 1852	—
Sir John Somerset Pakington, Bart.	John Fenwick	A Commander in the Royal Navy	2 Nov. 1852	38	1 Dec. 1846	6 "
	George Bayly	First Lord of the Treasury	16 Nov. 1853	—	16 Nov. 1853	—
	John Sydney Webb	An Admiral in the Royal Navy	12 Dec. 1854	—	12 Dec. 1854	—
	Edwd. Barry Nisbet	A retired Commander in the Merchant Sea Service.	1 Jan. 1856	50	6 July 1852	3 "
	Frederick Arrow	Iditto	21 April 1857	45	6 Feb. 1849	8 "
	Frederick Arrow	Iditto	2 July 1857	50	2 Nov. 1841	15 "
Viscount Palmerston	John Sydney Webb	Iditto	7 July 1857	43	1 Aug. 1848	9 "
	Edwd. Barry Nisbet	Iditto	11 Aug. 1857	47	4 Aug. 1849	17 "
	Frederick Arrow	First Lord of the Admiralty	15 Feb. 1859	—	15 Feb. 1859	—
	Frederick Arrow	A retired Commander in the Merchant Sea Service.	15 Feb. 1859	40	6 Feb. 1853	4 "
	Frederick Arrow	First Lord of the Treasury	20 Dec. 1859	—	20 Dec. 1859	—

1859.—Master, His Royal Highness the Prince Consort, K.G.

Deputy Master, Rear-Admiral Robert Gordon.

(E. E.)

P. H. BERTON, Secretary.

Trinity House, London,
24th December 1859.

RETURN to REQUISITION, dated 27th MAY 1859.

III. QUESTION III.—“Names, Profession, Dates of Admission of the Younger Brethren of the Trinity House, and their Age at the Time of Admission, if the same is recorded at the Trinity House.”

Name.	Profession.	Date.	Age.	Name.	Profession.	Date.	Age.
Crabtree, John	A Commander in the Merchant Sea Service.	5 July 1810.		Purrier, John	A Commander in the Merchant Sea Service.	7 May 1818	
Pocock, W. Innes	Do.	2 Aug. "	No Records	Jackson, James	Do.		
Sowden, Joseph	Do.	4 Sept. "		Wager, William	Do.	3 Sept. "	
Taylor, Thomas	Do.	2 May 1811		Short, John	Do.	2 Sept. 1819	
Durrell, Robert Tite	Do.	2 Jan. 1812		Whytock, George	Do.	" "	
Hunt, Ashfield	Do.	6 Feb. "		Taylor, James	Do.	4 Nov. "	
Desson, Samuel Foss	Do.	2 April "		Mitchell, William	Do.	3 Aug. 1820	
Foubister, Peter	Do.	1 Oct. "		Roxby, R. Benton	Do.	5 April 1821	
Bell, Glaister	Do.	3 Nov. 1814		Tarbutt, C. Bryan	Do.	" "	
Phillips, Levi	Do.	5 Jan. 1815		Tennant, Christopher	Do.	1 Nov. "	
Miller, George	Do.	5 Oct. "		Nicoll, Philip	Do.	" "	
Clegram, William	Do.	3 April 1816		Lech, John	Do.	7 Feb. 1822	
Lewington, Edward	Do.	2 May "		Robertson, James	Do.	" "	
Bayly, John	Do.	3 Oct. "		McKeller, William	Do.	4 April "	
Llewellyn, William	Do.	6 Feb. 1817	Chapman, Alfred	Do.	1 Aug. "		
Walker, David	Do.	5 March 1818	Williamsons, James	Do.	6 March 1823		
Francklin, J. Robinson	Do.	2 April "	Daniels, E. Maxwell	Do.	3 July "		
Honywill, Richard	Do.	7 May "	Hurry, Charles	Do.	1 Jan. 1824		

III. CONSTITUTION OF GENERAL AUTHORITY, &c.				III.			
Name.	Profession.	Date.	Age.	Name.	Profession.	Date.	Age.
Hasllope, Lancelot	A Commander in the Merchant Sea Service.	8 Jan. 1824		Dickenson, Thomas	A Captain, R.N.	5 May 1840	
Havaside, William	Do.	1 April "		Douglas, Sir J. Abraham	A Commander in the Merchant Sea Service.	"	
Amey, William	Do.	3 June "		Ritson, James	Do.	6 Oct. "	
Stephenson, George	Do.	14 Feb. 1825		Warren, Daniel	Do.	2 March 1841	
Majoribanks, William	Do.	2 June "		Bishop, Joseph	Do.	"	
Faith, William	Do.	4 Aug. "		Denham, H. Mangles	A Captain, R.N.	6 April "	
Dall, Patrick	Do.	6 Oct. "		Thompson, Henry	A Commander in the Merchant Sea Service.	4 May "	
Shepherd, James	Do.	1 Dec. "		Young, W. Ogston	Do.	1 June "	
Gordon, Alexander	Do.	2 Feb. 1826		Hall, John	Do.	3 Aug. "	
Middleton, Nathaniel	Do.	3 Aug. "		Gilmore, John	Do.	5 Oct. "	
Nicholls, George	Do.	7 Sept. "		Ingram, Charles	Do.	7 Dec. "	
Arnold, J. Hayman	Do.	7 Dec. "		Murray, W. Scott	Do.	4 Jan. 1842	
Shea, Charles	Do.	4 Jan. 1827		Lane, John William	Do.	7 June "	
Stewart, John	Do.	1 Feb. "		Drummond, H. Andrew	Do.	5 July "	
Barclay, Robert	Do.	5 July "		Weller, Charles G.	Do.	4 April 1843	
Driver, Thomas	Do.	4 Oct. "		Evans, George	A Captain, R.N.	5 Sept. "	
Mangles, C. Edward	Do.	1 Nov. "		Henderson, Andrew	A Commander in the Merchant Sea Service.	3 Oct. "	42
Henderson, James	Do.	7 Feb. 1828		Moore, H. Talbot	Do.	"	26
Hunt, Francis	Do.	7 Feb. 1828		Bowen, John	Do.	"	38
Dalrymple, W. H. Clarence	Do.	7 Aug. "		Lay, M. Jocelyn	Do.	7 Nov. "	30
Harris, Alexander	Do.	2 Oct. "		Walker, W. Harrison	Do.	5 Dec. "	43
Wilson, J. Peter	Do.	6 Nov. "		Freeman, Thomas	Do.	5 Nov. 1844	40
Kelso, Stephen	Do.	7 May 1829		Hight, Edward	Do.	4 Feb. 1845	35
Rennoldson, David	Do.	6 Aug. "		Pare, William Henry	Do.	1 July "	—
Turner, Henry	Do.	1 Oct. "		Hale, Henry	Do.	5 Aug. "	35
Roxburgh, David	Do.	"		Rickett, James	Do.	2 Dec. "	41
Ford, Robert	Do.	4 Nov. 1830		Jones, Lewis T.	A Captain, R.N.	2 June 1846	48
Brass, William	Do.	3 March 1831		Sullivan, Bart., James, C.B.	Do.	6 Oct. "	35
Irring, John	Do.	7 April "		Trivett, John, F.	A Commander in the Merchant Sea Service.	1 Dec. "	35
Boyes, Thomas	Do.	4 Aug. "		Jackson, Thomas T.	Do.	5 Jan. 1847	36
Tomlin, James	Do.	"		Wales, Douglas	Do.	2 Nov. "	39
Lamborn, William	Do.	"		George W. King	Do.	7 Dec. "	36
Miller, Thomas	Do.	6 Oct. "		Strickland, Thomas	Do.	6 March 1849	41
Story, Robert	Do.	2 Feb. 1832		Treadwell, Isaac	Do.	4 Dec. "	46
Young, Adam	Do.	"		Gilmore, R. Graham	Do.	1 Jan. 1850	27
Brown, J. Temple	Do.	1 March "		Cow, John	Do.	2 April "	43
Isacke, Robert Matthew	Do.	"		Weller, John	Do.	5 Nov. "	26
Grote, Joseph	Do.	2 Aug. "		Pixley, Thomas William	Do.	4 Feb. 1851	31
Ruffell, James	Do.	6 Sept. "		Thornton, Henry	Do.	4 March "	43
Richardson, George	Do.	4 Oct. "		Scott, Robert	Do.	"	48
Burton, junr, James	Do.	"		Hunter, Robert Laclian	Do.	3 June "	45
Thompson, Thomas	Do.	"		Neatby, Henry	Do.	5 Aug. "	47
Baker, Thomas	Do.	1 Nov. "		Omanney, Erasmus	A Captain, R.N.	3 Feb. 1852	35
Popplewell, Matthew	Do.	6 Dec. "		Falmer, N. Hitchin	A Commander in the Merchant Sea Service.	3 Aug. "	31
Sampson, Thomas	Do.	7 March 1833		Gibson, Joseph	Do.	5 Oct. "	40
Drew, Edward	Do.	4 April "		McLeod, Donald	Do.	3 May 1853	37
Chapman, Ingram	Do.	6 June "		Ellerby, John	Do.	7 June "	30
Sini, Alexander	Do.	5 Sept. "		Curling, William	Do.	2 Aug. "	36
Rutherford, John	Do.	7 Nov. "		Stephens, Daniel W.	Do.	27 Sept. "	36
Stonehouse, Christopher H.	Do.	"		Herd, David James	Do.	1 Nov. "	38
Stonhstone, Charles K.	Do.	5 June 1834		Carter, James George	Do.	6 Feb. 1855	—
Drew, William	Do.	3 July "		Young, Allen William	Do.	3 July "	29
Reid, Curtis	Do.	2 Oct. "		Pope, William H.	Do.	7 Aug. "	38
Martin, R. Francis	Do.	4 Jan. 1835		Brown, George John	Do.	4 Dec. "	45
De Roos, Hon. J. F. F.	A Captain, R.N.	3 Sept. "		Hibbert, James	Do.	1 Jan. 1856	40
Macnochie, Alexander	A Commander, R.N.	"		Godfrey, John B.	Do.	3 June "	38
Heathorn, J. Lidwell	A Commander in the Merchant Sea Service.	5 Nov. "		Toynbee, Henry	Do.	5 Aug. "	37
Embleton, Robert	Do.	7 Jan. 1836		Thorne, Joseph N.	Do.	14 July 1857	42
Arman, Thomas	Do.	1 Nov. "		Baker, R. Benjamin	Do.	4 Aug. "	43
Wheatley, Henry	Do.	6 Dec. "		Sturdee, Edward Thomas	Do.	1 Sept. "	41
Carr, William	Do.	7 Feb. 1837		Lambert, G. Patk.	Do.	3 Nov. "	42
Barton, James C.	Do.	"		Vaile, Lawrence W.	Do.	6 April 1858	34
Ridley, Anthony	Do.	1 Aug. "		Coleman, George	Do.	4 May "	38
Bell, Boulter J.	Do.	3 Oct. "		Collinson, Richard, C.B.	A Captain, R.N.	5 Oct. "	46
FitzRoy, Robert	Rear Admiral, R.N.	5 Dec. "		Tickell, George	A Commander in the Merchant Sea Service.	1 Feb. 1859	35
Glendinning, Fryer	A Commander in the Merchant Sea Service.	2 Jan. 1838		Cresswell, Samuel G.	A Captain, R.N.	7 June "	31
Jordesen, J. Pouditch	Do.	"					
Thacker, John	Do.	6 Feb. "					
Eden, J. Nixon	Do.	6 March "					
Sandys, Thomas	Do.	3 July "					
Ford, Gabriel	Do.	2 Oct. "					
Griffith, J. Pugh	Do.	6 Nov. "					
Gunton, Thomas	Do.	"					
Toller, William	Do.	7 May 1839					
Worsall, Thomas	Do.	6 Aug. "					

No Record.

ENGLAND.
Circular I.
Question III.

Trinity House, London, 24th December 1859.

(E. E.) P. H. BERTON, Secretary.

ENGLAND.
Circular L.
Question IV.

IV.

CONSTITUTION OF GENERAL AUTHORITY, &c.

IV.

RETURN TO REQUISITION, dated 27th May 1859.

SECTION IV.—CHANGES that have taken place in the List of ELDER BRETHREN (exclusive of the Honorary Members) since 1st January 1845, with the Dates of Vacancies, specifying the Cause of Vacancy, and the Name of the Person succeeding to the Vacancy.

List of the Acting Elder Brethren on the 1st of January, 1845, in the Order of Seniority.	Date of Vacancy (the Cause in each Case being Death).	Name of Person succeeding.	Date of Vacancy (the Cause in each Case being Death).	Name of Person succeeding.	Date of Vacancy (the Cause being Death).	Name of Person succeeding.	List of the Acting Elder Brethren on the 16th December 1859 in the Order of Seniority.
Captain Abel Chapman	31st Dec. 1849	Captain John Fulford Owen.					Captain Charles Weller.
" Aaron Chapman, M.P.	28th Dec. 1850	" Henry Shuttleworth.	17th Aug. 1852				" Frederick Madan.
" Andrew Timbrell	19th May 1850	" David James Ward	7th Nov. 1851				" William Pexley.
" Daniel Stephenson	26th Dec. 1846	" Edward Enford					" Charles Farquharson, a Lieut. R.N.
" Sir Jno. Henry Pelly, Bart., Deputy Master	13th Aug. 1852	" Richard W. Pelly, R.N.					Rear Admiral Robert Gordon (elected Deputy Master 1858.)
" Robert Wellbank	28th May 1857	" J. Sydney Webb.					Captain William E. Farrer.
" John Hayman	21st April 1851	" James Drew					" Henry Bonham Bax.
" John Rees	9th July 1850	" William Pigott.					" Gabriel J. Redman.
" Henry Nelson	29th March 1857	" John Fenwick.					" John Fulford Owen.
" John Locke	10th Dec. 1846	" John Shephard (elected Deputy Master 1852.)	12th Jan. 1859				" William Pigott.
" Alexander Weynton	2nd May 1847	" Gabriel J. Redman.					" Henry Shuttleworth.
" Charles Weller.							" James Drew.
" Frederick Madan.							" T. Narramore Were.
" Stephenson Ellerby	10th July 1857	" Edward Parry Nisbet.					" Richard W. Pelly, R.N.
" George Probyn	25th Nov. 1855	" Mark Currie Close.					" Mark Currie Close.
" William Pexley.							" John Fenwick.
" Charles Farquharson.							" George Bayly.
" Robert Gordon, R.N.							" J. Sydney Webb.
" William E. Farrer.							" Edward Parry Nisbet
" Henry Bonham Bax.							" Frederick Arrow.

* Captains Farquharson and Gordon were elected in the room of Captains Richard Drew and Jenkin Jones, who were drowned off Trevoze Head while on duty.

P. H. BERTHOE,
Secretary.

Trinity House, London.
16th December 1859.

V.

CONSTITUTION OF GENERAL AUTHORITY, &c.

V

RETURN TO REQUISITION, dated 27th May 1859.

ENGLAND.

Circular I.
Question V.

QUESTION V. "Division of Duties of the Elder Brethren, with names of individuals filling each office or composing each Committee, with mode of appointment, describing the functions of the General Board, and the amount of executive or administrative powers vested in each Committee."

For the efficient performance of the various duties of the Board the Elder Brethren are divided into committees, as follows, each committee taking its separate department:—

1st. *The Wardens*, of which the Deputy Master habitually acts as chairman. For all duties connected with treasury and finance, including questions of light dues collection, and repayment, the supervision of the accounts of every branch of the service, the examination of claims on the consolidated duties of customs, the examination or preparation of all forms of contract, and the acceptance or rejection of tenders thereon, the immediate supervision of the general working of the establishment and service, and all subjects connected with other departments involving special attention and consideration, referred to joint committees by the Board.

2d. *The Supervisors of the Ballast Department*.—For the general supervision of all matters connected with the ballast-getting service in the River Thames below London Bridge, the regulation of a proper and prompt supply of ballast to the trade, the superintendence of the building and repair of all dredgers, lighters, and barges, and of the management and efficiency of their crews, the investigation of all cases of collision with ballast craft, and the adjudication thereon, the examination of the accounts of receipt and expenditure, and attention to all the various matters of detail connected with the service.

The supervisors are also charged with the regulation of the ballast-heaving service of the river, so far as the heavers have voluntarily placed themselves under the protection of the Corporation.

No. of dredging vessels	3	Men employed therein	24
„ lighters	52	„ „ „	240
„ barges	16	„ „ „	145
„ ballast heavers	-	-	-

3d. *The Examining Committee*.—To examine into the qualifications as pilots of masters in the navy, and other persons referred to the corporation by the Lords Commissioners of the Admiralty, and to certify the result for transmission to their Lordships. To examine into the competency and qualification of persons applying to be licensed as pilots under the authority of the Corporation, and into the capacity of masters and mates in the merchant service, to pilot vessels of which they have charge, or others belonging to the same owners, for the rivers Thames and Medway, or the channels leading thereto; also to the westward as far as the Isle of Wight, and to the northward to the Baltic, and as far as Yarmouth Sands and Smith's Knowle, including Harwich, the Blackwater and Chelmer to Maldon, the Coln and Burnham, and vice versa; or for any intermediate distances. Also of persons desirous of obtaining an extension of the limits granted under the authority of previous licences; but the Committee cannot in either of the cases mentioned proceed to the examination of any person who has not been previously approved by the Committee for Pilotage, nor unless a warrant for his examination has been issued under the signature of the Deputy Master. The Committee also make an annual examination of the sands between Yarmouth and the South Foreland, and other localities where changes are likely to have taken place, and all notices to mariners are referred to them previous to issue, as well as all subjects which may have for object the practical improvement of navigation or the advancement of nautical science.

4th. *The Committee for Pilotage*.—To consider all subjects which are brought under the notice of the corporation with reference to pilotage in the home district and at the outports, and either to give immediate directions thereon or recommend a course of proceeding for adoption by the Board, as requisite. To supervise the proceedings of the superintendents or rulers of pilots at the Cinque Ports and Gravesend, and of the sub-commissions at the out-ports, more particularly with regard to the maintenance of a prompt and efficient supply of able and qualified men, with suitable vessels for the pilotage service. Personally to superintend and regulate the pilotage business at the port of London, including the character and conduct of all pilots, and the investigation of any complaints which may be made against them. To visit the outports to inquire into important questions that may arise connected with the

service. To examine or prepare all pilotage accounts and generally to carry out the provisions of the fifth part of the Merchant Shipping Act, 1854.

5th. *The Committee for Lighthouses, &c.*—To visit, at least once in each year, every station and store, including rock stations when possible to land, thoroughly inspect their efficiency, suggest needful alterations and repairs, and procure estimates for the same. To visit and inspect every light ship in like manner, to muster the crews, inspect their logs and expenditure books, and inquire into all complaints, accidents, &c. To take all light vessels to and from their stations; to superintend the construction and repair of all light vessels, buoys, and beacons. To regulate the employment of the steam and sailing vessels of the Corporation. To examine into the fitness of persons applying to be appointed lightkeepers or seamen. To take the general management of all such servants, and prepare recommendations to the Board in regard to removals, promotions, suspensions, grants of pensions, &c., and on all points connected with the due organization of a large body of men. To take preliminary steps in regard to contracts, and to arrange the tests for oil, stores, &c. To attend at the testing of mooring chains. To suggest, arrange, and superintend all experiments connected with the improvement of lighting apparatus, systems of lighting, buoying, &c. To examine into the expenditure of oil and other stores, to regulate the same, and order supplies to the stations. To see that the light-keepers are supplied with the portable libraries provided for their use, that divine service is performed on board the light vessels or stations remote from churches, and that every station on shore or afloat is maintained under the most favourable conditions as regards sanitary arrangements. To prepare the annual estimates connected with the department. To examine the accounts of disbursements by the agents and all other accounts relating to the business of the Committee, to ascertain that due economy is exercised in providing the supplies of necessary articles, and in conducting each establishment, and that the accounts of the tradesmen, when not at contract prices, are charged at fair and reasonable rates, and on approval to certify the same for payment by the Committee of Wardens. To give daily attendance at the house by one or other of their members in case of any exigency arising, and in the event of accident or collision to proceed at once to the station, and make the best arrangement practicable, both as to temporary measures and the settlement of salvage claims and awards for services rendered. To take measures for procuring lighting apparatus, stores, &c. for lighthouses abroad, when requested to do so by the home government. To furnish foreign governments, on application, with such particulars as may be required relative to the Trinity House system of lighting and buoying. To consider all letters and reports from the agents and others relative to the establishment or condition of the several lighthouses and floating lights, steam vessels and tenders, storehouses, buoys, and beacons, and to give such directions as are requisite, or make report thereon in their minutes to the Board or Court.

The members of the Light Committee are also chargeable with the personal superintendence of all the duties afloat in the home district, the monthly relief of light vessels, half-yearly buoy-shiftings, &c., &c., and, as a general rule, every committee afloat is made to include one or more members of the Light Committee.

6th. *The Committee for Pensioners*.—The duties of the Pension Committee formerly comprehended the grant and payment of all charitable pensions, but these having ceased, as regards all fresh applicants, in 1853, the functions of the Committee on that head have nearly terminated. Their remaining duties are to investigate the qualifications of applicants for occasional relief, and of the candidates for the Corporation's almshouses.

7th. *The Committee for House Affairs*.—To take charge of the maintenance and repair of the house on Tower Hill, to regulate the official and domestic accommodation therein, and to superintend the disbursement of all expenses connected therewith.

Under the charter of incorporation the Elder Brethren are also required to assist the Judge of the High Court of Admiralty on the hearing of cases in which questions of nautical experience are involved. Two attend at each case, on the requisition of the Judge.

All the Elder Brethren are *ex officio* members of the Ramsgate Harbour Trust, the Deputy Master and three others being at present on the Executive Committee.

Two of the Elder Brethren are also members of the Thames Conservancy Board; one, the Deputy Master, *ex officio*, the other being appointed by the Court of the Corporation.

ENGLAND.
Circular I.
Question V.

V.

CONSTITUTION OF GENERAL AUTHORITY, &c.

The names of the individuals at present filling each office or composing each Committee are as follows:—

Rear Admiral ROBERT GORDON, Deputy Master.

The Wardens,

- (The Deputy Master acting as Chairman.)
- Captain W. E. Farrer, Rental Warden.
- „ Henry B. Bax.
- „ Charles Weller.
- „ William Pixley.

The Supervisors of the Ballast Department.

- Captain Henry Shuttleworth.
- „ Gabriel J. Redman.

Examining Committee.

(For the Examination of Masters, &c. in the Royal Navy, Masters and Mates in the Merchant Service, Pilots, &c.)

- Captain T. Narramore Were.
- „ William Pigott.
- „ John Fenwick.
- „ James Drew.

Committee for Pilotage.

- Captain J. Sydney Webb.
- „ Frederick Madan.
- „ Charles Farquharson (Lieut. R.N.)
- „ John Fulford Owen.

Committee for Lighthouses, &c.

- Captain Mark C. Close.
- „ George Bayly.
- „ Richard W. Pelly, R.N.
- „ Edward Parry Nisbet.
- „ Frederick Arrow.

Committee for Pensioners.

- Captain William Pixley.
- „ Gabriel J. Redman.
- „ John Fulford Owen.
- „ Edward Parry Nisbet.

Committee for House Affairs.

- Captain William E. Farrer.
- „ Henry B. Bax.
- „ Gabriel J. Redman.
- „ John Fulford Owen.

The House and Pension Committees are composed of members of other committees.

The senior member of the Corporation is usually exempt from all committees, but is not so on the present occasion.

The appointment of members to serve on the above committees is made at a General Court of the Corporation, held before Trinity Monday in each year, when new members are selected to take the places of those going out by rotation, or otherwise, on Trinity Monday; and in the case of the Wardens, two are elected annually in the room of the two who have served their time as prescribed by the charter. The Deputy Master is *ex officio* chairman of all committees.

The functions delegated to the various committees are limited to matters of routine only, any question not strictly within that category being considered and discussed by the General Board at its weekly meetings, before being remitted to the committee to whose department the subject may refer. The minutes of the various committees on such special subjects, as well as on all matters in their respective departments, are, together with those of the weekly boards, read at the monthly courts, and confirmed, or otherwise, as may be determined upon. The accounts of the Corporation are audited quarterly by the General Board, in the manner more particularly described elsewhere.

P. H. BERTHON,
Secretary.

Trinity House, London,
24th December 1859.

RETURN TO REQUISITION, dated 27th MAY 1859.
SECTION VI.—“APPOINTED DAYS OF BOARD AND COMMITTEE MEETINGS.”

The General Court	On Trinity Monday for elections of Master and Deputy Master, and for making appointments to Corporate Offices under the Charter, and on the first Tuesday in every month.	For Pilotage For Lighthouses, &c. For Pensioners For House affairs	Every Tuesday. Every Tuesday. Every Tuesday. Every Tuesday.
The Board	Every Tuesday, except when Courts are held.		
The Audit	The fourth Tuesday in the months of January, April, July, and October.		
The Wardens	Every Tuesday.		
Supervisors of the Ballast Department	Every Tuesday.		
For examination of Masters, &c. in R.N., Pilots, &c.	Every Tuesday.		

The foregoing are the appointed days of meetings, but for many years the business has rendered more frequent meetings necessary, the Light and the Examining Committees therefore meet also on Thursdays, and in common with the other committees assemble by adjournment or special summons whenever requisite.

P. H. BERTHON,
Secretary.

Trinity House, London,
16th December 1859.

No. XI.

FOREIGN QUESTIONS

BY THE LIGHTHOUSE COMMISSION.

Numbers correspond with the Answers returned by the Governments
of Foreign Countries.

Roy

Coun

I. Desc

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XII. Fu

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XIII. F³¹.

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XV. Sta³³.

55.

XVI. D⁶⁹.

XVII. S⁵⁵.

XVIII. 1

XIX. St

XX. Des

XXI. Hc

XXII. H

XXIII. XXIV. 1

XXIV. F

VII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

VII.

ENGLAND.

DAILY ATTENDANCES OF THE ELDER BROTHERS IN 1857 and 1858, including those for Courts, Boards, and Committees, and showing those for Purposes of General Supervision of Details of Committees.

Circular I
Question VII.

Date.	Number of Brethren who attended.	Reason for Attendance.	Date.	Number of Brethren who attended.	Reason for Attendance.
1857.			1857.		
1 January -	10	General Purposes.	1 April -	13	General Purposes.
2 " -	8	Ditto.	2 " -	7	Committees and General Purposes.
3 " -	3	Ditto.	3 " -	7	General Purposes.
4 " -	Sunday.	—	4 " -	4	Ditto.
5 " -	10	General Purposes.	5 " -	Sunday.	—
6 " -	18	Committees and Court.	6 " -	13	Committees and General Purposes.
7 " -	7	General Purposes.	7 " -	16	Committees and Court.
8 " -	11	Committees and General Purposes.	8 " -	9	General Purposes.
9 " -	5	General Purposes.	9 " -	12	Committees and General Purposes.
10 " -	5	Ditto.	10 " -	Good Friday.	—
11 " -	Sunday.	—	11 " -	8	General Purposes.
12 " -	10	General Purposes.	12 " -	Sunday.	—
13 " -	18	Committees and Board.	13 " -	8	General Purposes.
14 " -	6	General Purposes.	14 " -	16	Committees and Board.
15 " -	13	Committees and General Purposes.	15 " -	10	Committees and General Purposes.
16 " -	14	General Purposes.	16 " -	11	Ditto.
17 " -	6	Ditto.	17 " -	12	General Purposes.
18 " -	Sunday.	—	18 " -	2	Ditto.
19 " -	11	General Purposes.	19 " -	Sunday.	—
20 " -	16	Committees and Board.	20 " -	10	General Purposes.
21 " -	4	General Purposes.	21 " -	16	Committees, Special Court, and Board.
22 " -	14	Committees and General Purposes.	22 " -	8	General Purposes.
23 " -	7	General Purposes.	23 " -	11	Committees and General Purposes.
24 " -	5	Ditto.	24 " -	5	General Purposes.
25 " -	Sunday.	—	25 " -	4	Ditto.
26 " -	11	General Purposes.	26 " -	Sunday.	—
27 " -	18	Committees and Board.	27 " -	8	General Purposes.
28 " -	6	General Purposes.	28 " -	14	Committees, Audit, and adjourned Court.
29 " -	13	Committees and General Purposes.	29 " -	9	General Purposes.
30 " -	12	Ditto ditto	30 " -	10	Committees and General Purposes.
31 " -	5	General Purposes.	1 May -	4	General Purposes.
1 February.	Sunday.	—	2 " -	8	Ditto.
2 " -	12	General Purposes.	3 " -	Sunday.	—
3 " -	18	Committees and Court.	4 " -	11	General Purposes.
4 " -	5	General Purposes.	5 " -	16	Committees and Court.
5 " -	11	Committees and General Purposes.	6 " -	9	General Purposes.
6 " -	8	General Purposes.	7 " -	8	Committees and General Purposes.
7 " -	3	Ditto.	8 " -	4	General Purposes.
8 " -	Sunday.	—	9 " -	5	Ditto.
9 " -	13	General Purposes.	10 " -	Sunday.	—
10 " -	17	Committees and Board.	11 " -	7	General Purposes.
11 " -	8	General Purposes.	12 " -	11	Committees and Board.
12 " -	12	Committees and General Purposes.	13 " -	6	General Purposes.
13 " -	8	Ditto ditto	14 " -	8	Committees and General Purposes.
14 " -	7	General Purposes.	15 " -	6	General Purposes.
15 " -	Sunday.	—	16 " -	3	Ditto.
16 " -	13	General Purposes.	17 " -	Sunday.	—
17 " -	17	Committees and Board.	18 " -	8	General Purposes.
18 " -	9	General Purposes.	19 " -	11	Committees and Board.
19 " -	14	Committees and General Purposes.	20 " -	4	General Purposes.
20 " -	7	General Purposes.	21 " -	5	Committees and General Purposes.
21 " -	7	Ditto.	22 " -	3	General Purposes.
22 " -	Sunday.	—	23 " -	3	Ditto.
23 " -	9	General Purposes.	24 " -	Sunday.	—
24 " -	16	Committees and Board.	25 " -	6	General Purposes.
25 " -	6	General Purposes.	26 " -	3	Ditto.
26 " -	12	Committees and General Purposes.	1 Her Majesty's birthday	kept.	—
27 " -	9	General Purposes.	27 " -	8	General Purposes.
28 " -	4	Ditto.	28 " -	14	Committees and Board.
1 March -	Sunday.	—	29 " -	8	Committees and General Purposes.
2 " -	13	General Purposes.	30 " -	5	General Purposes.
3 " -	16	Committees and Court.	31 " -	Sunday.	—
4 " -	7	General Purposes.	1 June -	12	Committees and General Purposes.
5 " -	8	Committees and General Purposes.	2 " -	16	Committees, Court, and Special Court.
6 " -	5	General Purposes.	3 " -	8	General Purposes.
7 " -	4	Ditto.	4 " -	14	Committees and General Purposes.
8 " -	Sunday.	—	5 " -	11	General Purposes.
9 " -	10	General Purposes.	6 " -	5	Ditto.
10 " -	13	Committees and Board.	7 " -	Sunday.	—
11 " -	8	General Purposes.	8 Trinity Monday	17	Adjourned Special Court.
12 " -	12	Committees and General Purposes.	9 " -	15	Committees and Board.
13 " -	9	General Purposes.	10 " -	5	General Purposes.
14 " -	5	Ditto.	11 " -	5	Ditto.
15 " -	Sunday.	—	12 " -	2	Ditto.
16 " -	12	General Purposes.	13 " -	10	Ditto.
17 " -	16	Committees and Board.	14 " -	Sunday.	—
18 " -	10	General Purposes.	15 " -	10	General Purposes.
19 " -	14	Committees and General Purposes.	16 " -	14	Committees and Board.
20 " -	6	General Purposes.	17 " -	12	General Purposes.
21 " -	3	Ditto.	18 " -	9	Committees and General Purposes.
22 " -	Sunday.	—	19 " -	6	General Purposes.
23 " -	14	Committees and General Purposes.	20 " -	3	Ditto.
24 " -	15	Committees and Board.	21 " -	Sunday.	—
25 " -	6	General Purposes.	22 " -	5	General Purposes.
26 " -	10	Committees and General Purposes.	23 " -	11	Committees and Board.
27 " -	11	General Purposes.	24 " -	6	General Purposes.
28 " -	4	Ditto.	25 " -	8	Committees and General Purposes.
29 " -	Sunday.	—	26 " -	6	General Purposes.
30 " -	10	Committees and General Purposes.	27 " -	4	Ditto.
31 " -	16	Committees and Board.	28 " -	Sunday.	—
			29 " -	6	General Purposes.
			30 " -	14	Committees and Board.

Circular I.
Question VII.

Date.	Number of Brethren who attended.	Reason for Attendance.	Date.	Number of Brethren who attended.	Reason for Attendance.
1857.			1857.		
1 July	6	General Purposes.	1 October	12	Committees and General Purposes.
2 "	14	Committees and General Purposes.	2 "	5	General Purposes.
3 "	11	General Purposes.	3 "	6	Ditto.
4 "	3	Ditto.	4 "	Sunday.	—
5 "	Sunday.	—	5 "	11	General Purposes.
6 "	12	General Purposes.	6 "	19	Committees and Court.
7 "	16	Committees, Court, and Special Court.	7 "	General Fast.	—
8 "	9	General Purposes.	8 "	12	Committees and General Purposes.
9 "	13	Committees and General Purposes.	9 "	15	Ditto ditto.
10 "	6	General Purposes.	10 "	4	General Purposes.
11 "	4	Ditto.	11 "	Sunday.	—
12 "	Sunday.	—	12 "	8	General Purposes.
13 "	11	General Purposes.	13 "	18	Committees and Board.
14 "	15	Committees and Adjourned Special Court.	14 "	10	General Purposes.
		Ditto.	15 "	9	Committee and General Purposes.
15 "	16	Committees and General Purposes.	16 "	8	Ditto.
16 "	7	General Purposes.	17 "	5	Ditto.
17 "	9	Ditto.	18 "	Sunday.	—
18 "	4	—	19 "	7	General Purposes.
19 "	Sunday.	—	20 "	12	Committees and Board.
20 "	8	General Purposes.	21 "	8	General Purposes.
21 "	14	Committees and Board.	22 "	6	Committees and General Purposes.
22 "	7	General Purposes.	23 "	11	General Purposes.
23 "	13	Committees and General Purposes.	24 "	7	Ditto.
24 "	6	General Purposes.	25 "	Sunday.	—
25 "	4	Ditto.	26 "	12	General Purposes.
26 "	Sunday.	—	27 "	16	Committees, Board, and Audit.
27 "	10	General Purposes.	28 "	7	General Purposes.
28 "	17	Committees, Board, and Audit.	29 "	17	Committees and General Purposes.
29 "	8	General Purposes.	30 "	5	General Purposes.
30 "	15	Committees and General Purposes.	31 "	7	Ditto.
31 "	8	General Purposes.			
1 August	6	Ditto.	1 November.	Sunday.	—
2 "	Sunday.	—	2 "	11	General Purposes.
3 "	8	General Purposes.	3 "	19	Committee and Court.
4 "	17	Committees and Court.	4 "	9	General Purposes.
5 "	7	General Purposes.	5 "	10	Committees and General Purposes.
6 "	10	Committees and General Purposes.	6 "	6	General Purposes.
7 "	3	General Purposes.	7 "	15	Committees and General Purposes.
8 "	2	Ditto.	8 "	Sunday.	—
9 "	Sunday.	—	9 "	12	General Purposes.
10 "	8	General Purposes.	10 "	19	Committees and Board.
11 "	17	Committees, Board, and Special Court.	11 "	7	General Purposes.
12 "	11	General Purposes.	12 "	10	Committees and General Purposes.
13 "	9	Committees and General Purposes.	13 "	9	General Purposes.
14 "	7	General Purposes.	14 "	7	Ditto.
15 "	5	Ditto.	15 "	Sunday.	—
16 "	Sunday.	—	16 "	13	General Purposes.
17 "	6	General Purposes.	17 "	18	Committees and Boards.
18 "	13	Committees and Adjourned Special Court.	18 "	10	General Purposes.
		Ditto.	19 "	14	Committees and General Purposes.
19 "	6	General Purposes.	20 "	10	General Purposes.
20 "	13	Committees and General Purposes.	21 "	4	Ditto.
21 "	4	General Purposes.	22 "	Sunday.	—
22 "	4	Ditto.	23 "	12	General Purposes.
23 "	Sunday.	—	24 "	19	Committees and Board.
24 "	5	General Purposes.	25 "	8	General Purposes.
25 "	15	Committees and Board.	26 "	10	Committees and General Purposes.
26 "	8	General Purposes.	27 "	15	Ditto ditto
27 "	14	Committees and General Purposes.	28 "	6	General Purposes.
28 "	6	General Purposes.	29 "	Sunday.	—
29 "	3	Ditto.	30 "	15	General Purposes.
30 "	Sunday.	—			
31 "	12	General Purposes.	1 December	19	Committees and Court.
1 September	19	Committees and Court.	2 "	8	General Purposes.
2 "	9	General Purposes.	3 "	14	Committees and General Purposes.
3 "	9	Committees and General Purposes.	4 "	7	General Purposes.
4 "	7	General Purposes.	5 "	6	Ditto.
5 "	1	Ditto.	6 "	Sunday.	—
6 "	Sunday.	—	7 "	13	General Purposes.
7 "	17	Committees and General Purposes.	8 "	17	Committees and Board.
8 "	18	Committees and Board.	9 "	7	General Purposes.
9 "	4	General Purposes.	10 "	15	Committees and General Purposes.
10 "	10	Committees and General Purposes.	11 "	9	General Purposes.
11 "	2	General Purposes.	12 "	5	Ditto.
12 "	6	Ditto.	13 "	Sunday.	—
13 "	Sunday.	—	14 "	14	General Purposes.
14 "	13	Committees and General Purposes.	15 "	19	Committees and Board.
15 "	17	Committees and Board.	16 "	10	General Purposes.
16 "	7	General Purposes.	17 "	16	Committees and General Purposes.
17 "	11	Committees and General Purposes.	18 "	10	General Purposes.
18 "	7	General Purposes.	19 "	7	Ditto.
19 "	5	Ditto.	20 "	Sunday.	—
20 "	Sunday.	—	21 "	14	General Purposes.
21 "	8	General Purposes.	22 "	18	Committees and Board.
22 "	15	Committees and Board.	23 "	5	General Purposes.
23 "	4	General Purposes.	24 "	13	Committees and General Purposes.
24 "	6	Committees and General Purposes.	25 "	Christmas Day.	—
25 "	8	Ditto ditto.	26 "	2	General Purposes.
26 "	6	General Purposes.	27 "	Sunday.	—
27 "	Sunday.	—	28 "	10	General Purposes.
28 "	11	General Purposes.	29 "	19	Committees and Board.
29 "	15	Committees and Board.	30 "	7	General Purposes.
30 "	6	General Purposes.	31 "	16	Committees and General Purposes.

VII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

VII.

ENGLAND.

Circular I.
Question VII.

Date.	Number of Brethren who attended.	Reason for Attendance.	Date.	Number of Brethren who attended.	Reason for Attendance.
1858.			1858.		
1 January -	5	General Purposes.	1 April -	10	General Purposes.
2 " -	8	Ditto.	2 " -	Good Friday.	—
3 " -	Sunday.	—	3 " -	7	General Purposes.
4 " -	13	General Purposes.	4 " -	Sunday.	—
5 " -	19	Committees and Court.	5 " -	12	General Purposes.
6 " -	8	General Purposes.	6 " -	19	Committees and Court.
7 " -	13	Committees and General Purposes.	7 " -	9	General Purposes.
8 " -	8	General Purposes.	8 " -	16	Committees and General Purposes.
9 " -	6	Ditto.	9 " -	6	General Purposes.
10 " -	Sunday.	—	10 " -	5	Ditto.
11 " -	13	General Purposes.	11 " -	Sunday.	—
12 " -	19	Committees and Board.	12 " -	11	General Purposes.
13 " -	10	General Purposes.	13 " -	16	Committees and Board.
14 " -	14	Committees and General Purposes.	14 " -	8	General Purposes.
15 " -	10	General Purposes.	15 " -	14	Committees and General Purposes.
16 " -	2	Ditto.	16 " -	9	General Purposes.
17 " -	Sunday.	—	17 " -	9	Ditto.
18 " -	13	General Purposes.	18 " -	Sunday.	—
19 " -	16	Committees and Board.	19 " -	10	General Purposes.
20 " -	8	General Purposes.	20 " -	15	Committees and Board.
21 " -	14	Committees and General Purposes.	21 " -	10	General Purposes.
22 " -	9	General Purposes.	22 " -	17	Committees and General Purposes.
23 " -	4	Ditto.	23 " -	11	General Purposes.
24 " -	Sunday.	—	24 " -	4	Ditto.
25 " -	8	General Purposes.	25 " -	Sunday.	—
26 " -	18	Committees, Board, and Audit.	26 " -	9	General Purposes.
27 " -	10	General Purposes.	27 " -	16	Committees, Board, and Audit.
28 " -	14	Committees and General Purposes.	28 " -	8	General Purposes.
29 " -	16	General Purposes.	29 " -	12	Committees and General Purposes.
30 " -	5	Ditto.	30 " -	6	Ditto ditto
31 " -	Sunday.	—	1 May -	4	General Purposes.
1 February -	16	General Purposes.	2 " -	Sunday.	—
2 " -	19	Committees and Court.	3 " -	16	General Purposes.
3 " -	9	General Purposes.	4 " -	19	Committees and Court.
4 " -	5	Committees and General Purposes.	5 " -	6	General Purposes.
5 " -	9	General Purposes.	6 " -	14	Committees and General Purposes.
6 " -	8	Ditto.	7 " -	7	General Purposes.
7 " -	Sunday.	—	8 " -	4	Ditto.
8 " -	15	General Purposes.	9 " -	Sunday.	—
9 " -	19	Committees and Adjourned Court.	10 " -	11	General Purposes.
10 " -	8	General Purposes.	11 " -	17	Committees and Board.
11 " -	16	Committees and General Purposes.	12 " -	11	General Purposes.
12 " -	9	General Purposes.	13 " -	11	Committees and General Purposes.
13 " -	6	Ditto.	14 " -	7	General Purposes.
14 " -	Sunday.	—	15 " -	3	Ditto.
15 " -	17	Committees and General Purposes.	16 " -	Sunday.	—
16 " -	19	Committees and Board.	17 " -	11	General Purposes.
17 " -	7	General Purposes.	18 " -	13	Committees and Board.
18 " -	12	Committees and General Purposes.	19 " -	8	General Purposes.
19 " -	9	General Purposes.	20 " -	13	Committees and General Purposes.
20 " -	6	Ditto.	21 " -	6	General Purposes.
21 " -	Sunday.	—	22 " -	6	Ditto.
22 " -	15	General Purposes.	23 " -	Sunday.	—
23 " -	19	Committees and Board.	24 " -	9	General Purposes.
24 " -	10	General Purposes.	25 " -	18	Committees and Board.
25 " -	15	Committees and General Purposes.	26 " -	7	General Purposes.
26 " -	8	General Purposes.	27 " -	10	Committees and General Purposes.
27 " -	6	Ditto.	28 " -	8	General Purposes.
28 " -	Sunday.	—	29 " -	11	Ditto.
1 March -	14	General Purposes.	30 " -	Sunday.	—
2 " -	19	Committees and Court.	31 Trinity Monday 19	Court.	—
3 " -	12	General Purposes.	1 June -	19	Committees and Court.
4 " -	15	Committees and General Purposes.	2 " -	10	General Purposes.
5 " -	5	General Purposes.	3 " -	13	Committees and General Purposes.
6 " -	6	Ditto.	4 " -	7	General Purposes.
7 " -	Sunday.	—	5 " -	11	Ditto.
8 " -	14	General Purposes.	6 " -	Sunday.	—
9 " -	17	Committees and Board.	7 " -	14	General Purposes.
10 " -	9	General Purposes.	8 " -	19	Committees and Board.
11 " -	12	Committees and General Purposes.	9 " -	13	General Purposes.
12 " -	7	General Purposes.	10 " -	10	Committees and General Purposes.
13 " -	6	Ditto.	11 " -	7	General Purposes.
14 " -	Sunday.	—	12 " -	3	Ditto.
15 " -	8	General Purposes.	13 " -	Sunday.	—
16 " -	16	Committees and Board.	14 " -	7	General Purposes.
17 " -	12	General Purposes.	15 " -	11	Committees and Board.
18 " -	11	Committees and General Purposes.	16 " -	6	General Purposes.
19 " -	7	General Purposes.	17 " -	12	Committees and General Purposes.
20 " -	8	Ditto.	18 " -	8	General Purposes.
21 " -	Sunday.	—	19 " -	6	Ditto.
22 " -	9	General Purposes.	20 " -	Sunday.	—
23 " -	14	Committees and Board.	21 " -	10	General Purposes.
24 " -	13	General Purposes.	22 " -	19	Committees and Board.
25 " -	14	Committees and General Purposes.	23 " -	11	General Purposes.
26 " -	14	Ditto ditto	24 " -	16	Committees and General Purposes.
27 " -	3	General Purposes.	25 " -	6	General Purposes.
28 " -	Sunday.	—	26 " -	6	Ditto.
29 " -	15	General Purposes.	27 " -	Sunday.	—
30 " -	17	Committees and Board.	28 " -	14	General Purposes.
31 " -	6	General Purposes.	29 " -	19	Committees and Board.
			30 " -	11	General Purposes.

ENGLAND.

VII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

Circular I.
Question VII.

Date.	Number of Brethren who attended.	Reason for Attendance.	Date.	Number of Brethren who attended.	Reason for Attendance.
1858.			1858.		
1 July	12	Committees and General Purposes.	1 October	10	General Purposes.
2 "	8	General Purposes.	2 "	2	Ditto.
3 "	21	Special Court.	4 "	9	General Purposes.
4 "	Sunday.		5 "	16	Committees and Court.
5 "	19	Committees and General Purposes.	6 "	11	General Purposes.
6 "	20	Committees and Court.	7 "	14	Committees and General Purposes.
7 "	10	General Purposes.	8 "	11	General Purposes.
8 "	15	Committees and General Purposes.	9 "	3	Ditto.
9 "	11	General Purposes.	10 "	Sunday.	
10 "	6	Ditto.	11 "	11	General Purposes.
11 "	Sunday.		12 "	17	Committees and Board.
12 "	16	General Purposes.	13 "	11	General Purposes.
13 "	19	Committees and Board.	14 "	3	Committees and General Purposes.
14 "	12	General Purposes.	15 "	5	General Purposes.
15 "	10	Committees and General Purposes.	16 "	8	Ditto.
16 "	8	General Purposes.	17 "	Sunday.	
17 "	5	Ditto.	18 "	11	General Purposes.
18 "	Sunday.		19 "	14	Committees and Board.
19 "	7	General Purposes.	20 "	9	General Purposes.
20 "	14	Committees and Board.	21 "	6	Committees and General Purposes.
21 "	8	General Purposes.	22 "	8	General Purposes.
22 "	8	Committees and General Purposes.	23 "	4	Ditto.
23 "	8	General Purposes.	24 "	Sunday.	
24 "	5	Ditto.	25 "	13	Committees and General Purposes.
25 "	Sunday.		26 "	17	Committees, Board, and Audit.
26 "	13	General Purposes.	27 "	9	General Purposes.
27 "	20	Committees, Board, and Audit.	28 "	16	Committees and General Purposes.
28 "	10	General Purposes.	29 "	12	General Purposes.
29 "	14	Committees and General Purposes.	30 "	4	Ditto.
30 "	12	General Purposes.	31 "	Sunday.	
31 August	7	Ditto.	1 November	19	Committees and General Purposes.
2 "	Sunday.		2 "	19	Committees and Court.
3 "	14	General Purposes.	3 "	10	General Purposes.
4 "	19	Committees and Court.	4 "	15	Committees and General Purposes.
5 "	4	General Purposes.	5 "	10	General Purposes.
6 "	8	Committees and General Purposes.	6 "	5	Ditto.
7 "	6	General Purposes.	7 "	Sunday.	
8 "	7	Ditto.	8 "	13	General Purposes.
9 "	Sunday.		9 "	19	Committees and Board.
10 "	12	General Purposes.	10 "	7	General Purposes.
11 "	15	Committees and Board.	11 "	11	Committees and General Purposes.
12 "	11	General Purposes.	12 "	8	General Purposes.
13 "	5	Committees and General Purposes.	13 "	2	Ditto.
14 "	11	General Purposes.	14 "	Sunday.	
15 "	5	Ditto.	15 "	16	Committees and General Purposes.
16 "	Sunday.		16 "	19	Committees and Board.
17 "	10	General Purposes.	17 "	11	General Purposes.
18 "	15	Committees and Board.	18 "	16	Committees and General Purposes.
19 "	8	General Purposes.	19 "	12	General Purposes.
20 "	7	Ditto.	20 "	4	Ditto.
21 "	7	Ditto.	21 "	Sunday.	
22 "	6	Ditto.	22 "	12	General Purposes.
23 "	Sunday.		23 "	17	Committees and Board.
24 "	11	General Purposes.	24 "	8	General Purposes.
25 "	18	Committees and Board.	25 "	12	Committees and General Purposes.
26 "	9	General Purposes.	26 "	12	General Purposes.
27 "	9	Committees and General Purposes.	27 "	3	Ditto.
28 "	10	General Purposes.	28 "	Sunday.	
29 "	4	Ditto.	29 "	12	General Purposes.
30 "	Sunday.		30 "	11	Committees and Board.
31 "	8	General Purposes.	1 December	17	General Purposes.
1 September	14	Committees and Board.	2 "	13	Committees and General Purposes.
2 "	7	General Purposes.	3 "	6	General Purposes.
3 "	9	Committees and General Purposes.	4 "	5	Ditto.
4 "	10	General Purposes.	5 "	Sunday.	
5 "	5	Ditto.	6 "	15	General Purposes.
6 "	Sunday.		7 "	19	Committees and Court.
7 "	12	General Purposes.	8 "	7	General Purposes.
8 "	19	Committees, Court, and Board.	9 "	7	Committees and General Purposes.
9 "	9	Committees and General Purposes.	10 "	10	General Purposes.
10 "	12	Ditto.	11 "	2	Ditto.
11 "	4	General Purposes.	12 "	Sunday.	
12 "	7	Ditto.	13 "	15	General Purposes.
13 "	Sunday.		14 "	19	Committees and Board.
14 "	7	General Purposes.	15 "	14	Committees and General Purposes.
15 "	12	Committees and Board.	16 "	15	Ditto ditto
16 "	9	General Purposes.	17 "	11	Ditto ditto
17 "	8	Committees and General Purposes.	18 "	5	General Purposes.
18 "	12	General Purposes.	19 "	Sunday.	
19 "	3	Ditto.	20 "	10	General Purposes.
20 "	Sunday.		21 "	19	Committees and Board.
21 "	13	General Purposes.	22 "	6	General Purposes.
22 "	7	Committees and Board.	23 "	15	Committees and General Purposes.
23 "	12	General Purposes.	24 "	10	General Purposes.
24 "	9	Committees and General Purposes.	25 "	Christmas Day.	
25 "	12	General Purposes.	26 "	Sunday.	
26 "	3	Ditto.	27 "	9	General Purposes.
27 "	Sunday.		28 "	19	Committees and Board.
28 "	13	General Purposes.	29 "	10	General Purposes.
29 "	18	Committees and Board.	30 "	13	Committees and General Purposes.
30 "	9	General Purposes.	31 "	5	General Purposes.
31 "	6	Committees and General Purposes.			

Trinity House, London,
16th December 1859.

Note.—This portion of the return furnished by the Trinity House was accompanied by voluminous lists giving all the information required; but it was not thought necessary to print them.

P. H. BERTHOX,
Secretary.

VIII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

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ENGLAND.

RETURN to REQUISITION dated 27th May 1859.

QUESTION VIII.—NAMES of ELDER BRETHREN who had been employed on SPECIAL SERVICES or INSPECTIONS in 1857 and 1858, describing Services on which they were employed, and time occupied in such Services.

The duties aforesaid belong more especially to the Light Committee, but other Elder Brethren are frequently associated with them, or are appointed by the Board to a particular duty.

Captain WERE.—1857, Jan. 7 to 9.

Relieving crews of light-vessels, &c., London district.

Captains SHUTTLEWORTH and CLOSE.—January 19 to 21.

Attending at Plymouth to inquire into the charges made against the Corporation's superintendent there, by a discharged seaman.

Captain REDMAN (with Messrs. Walker and Burgess, Engineers).—January 26 and 27.

Inspection of the Maplin Lighthouse, which had been struck by a vessel.

Captain WERE.—February 4 to 6.

Relief duty, London district.

Captains OWEN and DREW.—February 12 to 16.

Committee to Padstow, to investigate into the charges of neglect on the part of the pilots of that port, preferred by the Receiver of Droits thereat, in the matter of the loss of the smack "Ann" of Jersey, and the grounding of the steam ship "Royal Adelaide."

Captain SHUTTLEWORTH and four other Brethren.—February 23.

Trial trip of the new steam vessel "Argus."

Captains BAX, DREW, and WERE.—March 4 to 6.

Relief duty, London district.

Captains SHUTTLEWORTH, REDMAN, and CLOSE.—March 4 to 11.

Committee to Bristol and St. George's Channels.—4th, visited Milford and works at Solva; 5th, inspected lantern and apparatus at Solva; 6th, inspected St. Ann's and timber for Smalls lighters; examined Caldly Sound; visited Caldly establishment. 7th, placed a buoy in the fairway from Caldly Roads. 9th, placed a wreck buoy; inspected Tuskar Beacon; inspected Nash. 10th, inspected Usk and Flat-holm, and placed the Cockburn Spit buoy; visited the Avon Light; proceeded to Bristol, and returned to London.

Captain WERE.—March 24 to 27.

Buoy shifting duty, and verifying correctness of position of each buoy, &c.

Captains SHUTTLEWORTH, FARQUHARSON, BAX, and REDMAN.—April 1 to 4.

Committee to the Varne Shoal.—Left London with buoy in tow. 2d, parted hawser off Dover with heavy sea; bore up for Ramsgate. 3d, left Ramsgate without buoy; examined shoal; laid several watch buoys; laid a wreck buoy; weather being hazy, proceeded for Dover Roads. 4th, weather continuing thick, proceeded for Prince's Channel, and substituted a smaller buoy for that at the North Tongue; sounded along the edge of the Girdler Spit; visited Nore Light vessel, and returned to London.

Captains WERE and PIGOTT.—April 1 to 6.

Buoy-shifting duty, &c.

Captain SHUTTLEWORTH (with Mr. Burgess, C.E.)—April 9 to 11.

To Point of Air Light.—A chasm having opened in the sand near the foundations.

Captains BAX and WERE.—April 22 to 28.

Committee to the Varne Shoal, Needles, &c. Anchored at Nore. 23d, laid a wreck buoy at the Mouse; landed oil and stores at Ramsgate; examined the Bunt Head and South Brake; sounded the Varne, and returned to Ramsgate. 24th, left Ramsgate with the Varne buoy, and laid it; put a new globe on the Royal Sovereign

buoy; 25th, at Cowes; visited the Needles Rock and Totland Bay Station; visited the Hurst Lighthouses; coaled at Southampton; returned to Cowes. 27th, proceeded to Ramsgate; took in empty tins, buoys, &c. 28th, at Blackwall.

Captains REDMAN and FARRER.—April 22 to May 2.

Committee to St. George's Channel.—23d, off the Eddystone, unable to land; proceeded for the Catwater. 24th, off Longships, unable to land; proceeded for Lundy Island, unable to land; steered for Milford. 25th, visited buoy stores and inspected lighters. 27th, landed on Smalls, inspected lantern, supports, &c.; visited works at Solva; landed, and inspected South Bishop and Bardsey. 28th, visited South Stack, and inspected plans of new dwellings, &c.; visited Skerries. 29th, landed stores; and inspected Menai and Point of Air, and house and buoy store at Hilbre Island. 30th, visited buoy store at Ramsay; delivered stores, and inspected Bahama Bank light vessel; visited St. Bees, and returned to London.

Captain SHEPHERD, Deputy Master; Rear-Admiral GORDON, Captains BAX, REDMAN, DREW, and WERE (Captain Sullivan, of the Board of Trade, with the Committee).—May 6 to 26.

Committee to West of Ireland and round Scotland.—7th, inspected Longships; met the "Vestal" with committee of Port of Dublin corporation off Queenstown. 9th, unable to land at Fastnet Rock; landed on and attempted ascent of Bull Rock; visited Skelligs; steered round the Foze Rock; examined the Blaskets; anchored in Valentia Harbour. 11th, examined Achill Head, Black Rock, &c.; anchored in Broadhaven Bay. 12th, anchored in Ballycastle Bay. 13th, brought up off Crinan; proceeded to Oban for coals. 14th, inspected locality of Corran Point; returned to Oban. 15th (with Mr. Stevenson, C.E., and Mr. Anderson, master of the "Pharos"); landed on the island of Pladda or Bladda; proceeded through sound of Jura; examined Ruadh Rock or Grunc; landed on the Skuervoile or Iron Rock; proceeded towards the Sound of Islay; landed at McArthur's Head; landed and examined the Black Rocks; landed at Rhu Vaal; proceeded to Loch Leagh, and anchored. 16th, through Iona and Kerrera sounds to Oban for coals. 18th, passed Lismore, Ardnamurchan, Isle Oronsay, and Guilan Island lighthouses; took refuge in Portree. 19th, passed through Rona Sound, to inspect lighthouse; passed Rhu Rea, Priest Island, and Morehead; landed at Stourhead, and examined surrounding coast; proceeded round Cape Wrath, and anchored in Serabster Roads. 20th, proceeded through the Pentland and round the east coast; landed, and inspected Buchanness; arrived at Aberdeen. 21st, Captain Sullivan and Mr. Stevenson left; proceeded from Aberdeen; visited Bell Rock Lighthouse; moored alongside Granton Pier. 22d, coaled. 23d, visited outer Fern; landed on Coquet Island. 24th, visited Seaton and Tees buoy store. 25th, examined Tees Navigation with Mr. Lister, the agent; stopped in Ilwak Roads; visited Spurn lighthouses; proceeded for London.

Captains PIGOTT and FENWICK.—May 7 to 9.

Relief duty, and changing position of the Bunt Head buoy.

Captains SHUTTLEWORTH, BAX, CLOSE, FENWICK, and BATLY.—June 9 to 13.

Committee to Portland and the Isle of Wight.—Anchored in Margate Roads on account of weather. 10th, in Totland Bay; visited Needles, and landed oil and stores; visited Hurst Lighthouses, and landed oil and stores. 11th, at Portland; landed stores, and visited lighthouses, &c.; proceeded for St. Catherine's, but found too much sea on to land; proceeded for

VIII.

Cowes, landed oil and stores, and anchored in St. Helen's Roads. Inspected and landed stores at Beachy Head, Dungeness, and South Foreland; returned to Blackwall on 13th.

Captains BAX, WERE, and FENWICK.—June 18 to 22.

Committee to Yarmouth.—19th, inspected stores and wharf and St. Nicholas Light Vessel; sounded along the west side of the Scroby and the Cockle and Barber Sands; boarded the Stanford Light, and returned to Lowestoft Harbour. 20th, examined Stanford Channel and Pakefield Gat; sounded about the Newcombe Sand; laid a wreck buoy in position, to which the Stanford Light Vessel was subsequently moved; sounded about the Kettlebottom, South Scroby, and back of Cross Sands; relaid the South Barber buoy, and returned to Yarmouth.

Captains PIXLEY, FARRER, and SHUTTLEWORTH.—June 18 to 26.

Committee of Inspection and Supply to the westward.—The Tortoise lighter taken in tow off Southend, but cast off at the Nore on account of weather; master instructed to proceed to Totland Bay when practicable. 19th, off the Start, unable to land; moored in Mill Bay, and coaled. 20th, landed oil and stores at Lizard; inspected station, and received empty tins; landed at Sennen Cove; visited Longships dwellings; visited Longships Light; anchored at Penzance. Monday 22d, in St. Mary's Roads; inspected work on shore for the "Bishop;" steamed round the "Bishop;" unable to land; examined premises at St. Agnes. 23d, returned to Sennen, and re-inspected dwellings with surveyor, &c.; touched at Falmouth; coaled at Plymouth; proceeded for Eddystone: unable to land; visited Start; took in empty tins at Portland; landed at Dungeness; laid a wreck buoy between Folkestone and Dover; anchored in the Downs: arrived at Blackwall.

Captains CLOSE and BAYLY.—June 19.

Committee to shift Seven Stones Light Vessel, and for Lundy Island.—When off Broadstairs, discovered new cylinder cover of the engine to be defective and dangerous; returned to Blackwall.

June 24 to July 2.—The above service resumed. 25th, coaled at Plymouth. 26th, anchored off Lundy; commenced landing cases of lighting apparatus and stores; inspected establishment; proceeded to Milford, and coaled. 27th, inspected ground proposed for new buoy store at Wear Point; inspected coal hulk and spare light vessel for Seven Stones; took the latter in tow, and anchored at Scilly. 29th, took the spare light vessel in tow, and moored her; proceeded for St. Mary's with old vessel in tow; bore up, and anchored at East Grimsby in consequence of heavy sea. 30th, proceeded for Plymouth; saw that the Seven Stones was all right; sighted the Wolf; coaled at Millbay; inspected the Breakwater Light; anchored at Portland for empty tins. 1st July, in Totland Bay; inspected Hurst Lighthouses; visited buoy store at Cowes; inspected Beachy Head; sighted Royal Sovereign and Varne buoys.

Rear-Admiral GORDON and Captain REDMAN.—June 23.

To North Foreland Lighthouse and Reading Street Beacon.

Captains BAX and DREW.—June 26 to 29.

Committee to the Tees.—Arrived at Stockton; called on secretary to Tees Conservancy Board; proceeded to Middlesbrough; had interview with dockmaster: weather too thick to see beacons; had interview with a commissioner and the engineer; returned to Stockton, after ascertaining that the only safe channel was buoyed off.

CONSTITUTION OF GENERAL AUTHORITY, &c.

Captain FENWICK.—July 8 and 9.

Relief duty.

Captains CLOSE and BAYLY.—July 9 to 22.

Committee to the westward.—10th, anchored and coaled at Plymouth. 11th, inspected Breakwater Light; stood out to the Eddystone, but found too much sea on to land; landed and visited Lizard; attempted to land at Bishop, but too much sea on; landed stores at St. Mary's, and inspected Seven Stones Light Vessel there. 13th, attempted to land at Longships, but too much sea on; landed stores, and inspected establishments at Trevoise and Lundy; anchored at Milford. 14th, received stores for Helwicks; laid two buoys in Caldy Sound; landed stores, and visited lighthouse. 15th, relieved and inspected Helwicks Light Vessel; visited Bideford, and landed stores; inspected Nash and Flatholm, and landed stores; supplied stores to and inspected English and Welsh Grounds Light Vessel; inspected Avon; unable to land at Burnham. 17th, landed stores and inspected Burnham; coaled at Cardiff. 18th, inspected Usk and buoy store at Cardiff. 20th, landed and inspected Smalls; unable to land at South Bishop; inspected the Bardsey and South Stack. 21st, inspected Menai and Black Rock Beacon; visited Skerries, and proceeded to Milford. 22d, inspected establishment at St. Ann's, and returned to London by rail.

Captain DREW.—August 5 and 6.

Relief duty.

Captains REDMAN, BAX, FENWICK, and BAYLY.—August 5 to 11.

Committee to the Owers, Caskets, &c.—6th, surveyed the Owers Sand, and changed the moorings and position of the light vessel; anchored off St. Catherine's, and visited the establishment. 7th, made fast at Alderney, blowing too hard to proceed to the Caskets. 8th, still blowing hard with a heavy sea. Monday, 10th, proceeded for the Caskets; landed stores, and inspected the establishment; returned to Alderney; landed the agent and labourers; proceeded for London, and arrived there on the 11th.

Captains SHUTTLEWORTH, PIXLEY, PELLY, CLOSE, and WEBB.—August 12 to 25.

Committee to East Coast and Heligoland.—13th, visited and supplied the Winterton, Haisbro', and Cromer establishments; visited the Dudgeon Light Vessel, and anchored in Hawke Roads. 14th, visited the Spurn Point establishment; anchored in Bridlington Bay; landed, and visited Flamborough Head establishment; examined cliff and headlands, for the purpose of ascertaining the best site for a fog signal station; anchored off Hartlepool. 15th, landed stores at Seaton; proceeded to North Shields for coals; unable to land at the Coquet, there being too much sea on; anchored under the Inner Fern Island in a thick fog. 16th, visited and supplied the Ferns; returned to the Coquet, where the carpenter broke his leg in assisting landing chains, sinks, &c.; proceeded to Bridlington for a surgeon, and landed the man. 18th, proceeded for Heligoland. 19th, surveyed the cottage, &c., in company with surveyor and agent; proceeded to Gluckstadt for coal. 21st, called at Heligoland for empty tins and cases. 22d, inspected the Leman and Ower, Haisbro' and Lynn Well Light Vessels; anchored off Hunstanton. Monday, 24th, too much sea on to board any of the light vessels off Yarmouth; proceeded for Lowestoft; visited the establishment, as also that at Pakefield; anchored at Harwich. 25th, visited the establishments and the Sunk Light Vessel, and returned to Blackwall.

Captains CLOSE, BAX, and BAYLY.—September 2 to 5.

To place the Bembridge Light Vessel.

VIII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

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ENGLAND.
Circular I.
Circular VIII.

Captain BAYLY.—September 8 to 13.
To South Sand Head, Goodwin and Aldbro' Knaps.

Captain REDMAN (with Mr. WILKINS).—September 15 to 18.
To Lundy, to inspect the apparatus of that light, it being out of order.

Captain SHUTTLEWORTH and one other Elder Brother.—September 23 to 25.
To Yarmouth, Lowestoft, and Pakefield.

Captains BAYLY, WEBB, and FENWICK.—September 22 to 26.
Buoy shifting, &c.

Captains BAYLY, WEBB, and FENWICK.—September 29 to October 2.
Buoy shifting, &c.

Captain SHEPHERD, Deputy Master, and other Brethren, with Mr. FARADAY.—October 13.
Committee to Brentwood.—To observe experiments made at Blackwall for testing the relative power and efficiency of different systems of illumination.

Ditto - ditto.—October 20.
Committee to Hornchurch.—The same.

Ditto - ditto.—November 10.
Committee to Hornchurch.—The same.

Captains SHUTTLEWORTH, CLOSE, and NISBET.—October 14 to 28.
Committee to the Westward.—16th, coaled at Plymouth, and anchored at Scilly. 17th, took the Seven Stones Light Vessel in tow; when clear of the islands found too much swell, and wind freshening; bore up, and anchored in St. Mary's Sound. 18th and 19th, a fresh gale. 20th, left with the light vessel, and moored her at her station; weighed moorings of the Spare Light, and took her in tow, and arrived at Milford on the 21st. Examined the plot of land for Corporation's store pointed out by the Admiralty. 22d, proceeded to the northward; when off St. David's Head encountered a heavy gale at north-east, with a high sea running; deemed it prudent to bear up; returned to Milford. 23d and 24th, gale still continuing. Monday, 26th, left Milford; landed, and examined Lundy Island; anchored in Falmouth Harbour. 27th, received empty tins at Plymouth, and arrived at Blackwall on 28th.

Captains BAX, FARQUHARSON, FENWICK, and BAYLY.—October 29 to 31.
Committee to Sea Reach and the Medway.—Landed a temporary beacon on Canvey Island; proceeded up the Medway; the weather coming on thick, anchored at Sheerness; proceeded to Canvey Island; fixed beacon; sounded at low water over the Yantlett Middle; placed temporary buoys; took angles, &c.; anchored in Leigh Roads. 31st, sounded round the Yantlett Middle; proceeded up the Medway, examining marks up Chatham Reach; landed near the Scar Houses, and determined the position for a beacon on Canvey Island, to lead open south of the Chapman Light House into the best water between the Yantlett and river Middle; returned to Blackwall.

Captains BAYLY and FENWICK.—November 4 to 6.
Relief duty.

Captains SHEPHERD (Deputy Master) and BAYLY and two other Elder Brethren.—November 7.
To Woolwich, to inquire into the fitness of maroons for fog signals.

Captains BAX and WERE.—November 5 to 9.
Committee to the Tees.—To mark the alterations in the entrance of the Tees, and to shift lights and buoys accordingly; and to Redcar, to enable the Board to report upon letter from Earl of Zealand to the Board of Trade relative to lights to guide fishing vessels into the anchorage in the "Lead."

Captains BAYLY, FENWICK, WEBB, and NISBET.—November 10 to 13.
Buoy shifting.

Captains BAYLY and FENWICK.—December 1 to 4.
Relief duty.

Captains REDMAN, CLOSE, and NISBET.—1858, January 14 to 23.
Committee to Holyhead &c.—By railway to Milford; went on board the "Vestal," off the Point. 15th, steamed to Milford, and inspected the "Solva" tug; proceeded to Nayland, to select a site for proposed store; anchored in Dale Roads. 16th, inspected Bardsey establishment; anchored at Holyhead. Monday, 18th, proceeded to the telegraph station, accompanied by Mr. Righy, to make arrangements for experiments with gun and maroons; inspected the South Stack establishment. 19th and 20th, blowing very hard. 21st, left Holyhead Harbour for South Stack; witnessed experiments with fog-bell, gun, and maroons. Inspected Skerries; returned to Holyhead Harbour. 23d, returned to London.

Captains SHUTTLEWORTH, WERE, FENWICK, BAYLY, WEBB, and NISBET.—February 2 to 6.
Committee to Antwerp.—Accompanying the Royal Yacht conveying their Royal Highnesses the Prince and Princess Frederic William of Prussia; proceeded down the river from Gravesend, about two cables' length in the wake of the Royal Yacht, and anchored at the Nore. 3d, proceeded ahead of the yacht, sounding at times; received a despatch from the yacht for Her Majesty; handed same to the master of a Belgian steamer bound to London; arrived at Antwerp. 5th, proceeded for London; anchored on the edge of the Cant. 6th, arrived at Blackwall.

Captains BAYLY, BAX, and NISBET.—March 3.
Relief duty.

Captains BAX and FENWICK.—March 10 to 16.
Committee to the Tees.—Arrived at Stockton, and had a conference with the secretary to the Conservators as to putting out the Bran Sand Lights. 11th, a further conference on same subject with secretary and engineer. 12th, proceeded to Scaton, a strong gale blowing; inspected the buoy store, &c. 15th, examined the Channels; took bearings, &c.; arrived at Middlesbro', and proceeded on to Stockton; met three of the commissioners and the engineer, and conferred respecting the placing of temporary lights.

Captains BAYLY and WEBB.—March 18 and 19.
To shift the Swin Middle Light Vessel.

Captains PIXLEY, SHUTTLEWORTH, CLOSE, and NISBET.—March 17 to 24.
Committee to the Westward.—Left Blackwall with the Godrevy Light Vessel in tow, and anchored for the night on the Cant. 18th, proceeded, and coaled at Plymouth. 20th, arrived in St. Ives Bay; engaged a crew, and proceeded (accompanied by the harbour-master, Lloyd's agent, and two of the most experienced pilots and others), to select a spot for the light vessel; took marks and angles, and placed two temporary buoys; towed out the light vessel, and moored her; on sounding round the Stones, discovered the mast of a sunken vessel, of the loss of which the authorities at St. Ives were unaware; placed a 6 ft. buoy outside the Stones, to test the quality of the holding ground; too much swell to land on Godrevy; anchored in St. Ives Bay; light exhibited the same evening. Monday, 22d, landed, and inspected Longships; anchored at Sennen Cove, and inspected oil store and Dwellings; proceeded, and moored in Plymouth Sound; coaled. 23d, stood out for the Eddystone, but unable to land; proceeded, landed, and inspected the new lighthouse at the Needles;

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inspected the Calshot Light Vessel, and arrived on the 24th at Blackwall.

Captains BAYLY, NISBET, WEBB, and FENWICK.—March 30 to April 1.

Buoy shifting.

Captains FARRER, WEBB, and OWEN.—April 6 to 15.

Committee to Falmouth.—To inquire into the loss of the ship "Northern Empire," in so far as the question of pilotage and proper anchorage is concerned, and also into the practice of pilots anchoring vessels so as to impede the Channel and its entrances.

From thence to Bristol and Newport.—To inquire into a complaint made by the Bristol Channel pilots that the Newport pilots continued in charge of vessels out of their district.

Captains BAYLY, BAX, and NISBET.—April 19 to 21.

Buoy shifting.

Captains SHUTTLEWORTH and CLOSE.—April 23 and 24.

Committee to Harwich and Orford.—Left Blackwall with oil and stores for Harwich; inspected light establishments and buoy store; visited light at Langard Fort; landed oil and stores. 24th, proceeded to Orfordness, and inspected establishments; inspected Gunfleet, and returned to Blackwall.

Captains REDMAN, FENWICK, and NISBET.—April 23 to 27.

Committee to the Ramsgate District.—Inspected the Nore Light Vessel; moored in Ramsgate Harbour. 24th, visited the North Sand Head Light Vessel; passed close to and examined the monster buoys outside the Goodwin. Monday, 26th, left Ramsgate for Gull Light Vessel, to assist in clearing her moorings; landed, and visited the North Foreland Lighthouse, the Reading Street and Monekton Beacons, and North Down Tower. 27th, proceeded to the Gull Light, and laid out mooring chain; returned to Ramsgate; took in empty tins; shifted East Tongue Buoy, which was waterlogged, and returned to Blackwall.

Captains WELLER, SHUTTLEWORTH, DREW, and CLOSE (with Captain SULIVAN, of the Board of Trade, and Mr. WALKER, the Corporation's engineer).—April 27 to May 1.

Committee to the Channel Islands, &c.—28th, inspected St. Catherine's Lighthouse, visited the Needles Lighthouse, building, and inspected the Hurst establishments; moored off Cowes, and discharged oil and stores for the district; coaled (here Captain Sullivan and Mr. Walker joined). 29th, proceeded to Alderney; landed, and examined the outer and inner Hanois; proceeded to Guernsey; anchored, landed, and made inquiries respecting the tides, &c. 30th, proceeded to Jersey, but in consequence of bad weather bore up for Alderney, and there landed stores for the Casquets; proceeded to Cowes, received the empty tins, and on 1st May returned to Blackwall.

Rear-Admiral GORDON and Captain REDMAN.—April to North Foreland and Reading Street Beacon.

Captains BAYLY and FENWICK.—May 4 and 5.

Relief duty.

Captains BAYLY and WERE.—May 6 to 10.

Shifting the Swin Middle Light Vessel.

Rear-Admiral GORDON, Captains BAX, REDMAN, CLOSE, and NISBET (Captain SULIVAN, of the Board of Trade, with the Committee).—May 12 to 20.

Committee to St. Abb's Head.—13th, in Whitby Harbour. 14th, landed the lantern work for the new lighthouses, and inspected the buildings. 15th, proceeded to the northward, and made fast to a buoy near to Berwick Harbour. Monday, 17th, stood out and joined the Northern Lights vessel "Pharos," off St. Abb's Head; landed on the north side, and walked to the head, accompanied by three of the Commissioners and Mr. Stevenson, and selected a site

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for a lighthouse on a projecting head; returned on board, and proceeded southward; visited and delivered oil and stores at the Ferns and Coquet. 18th, coaled at Hartlepool. 19th, to the southward, blowing hard; anchored off the Haisbro' Lighthouses. 20th, at Blackwall.

Captains SHUTTLEWORTH, PINLEY, WERE, FENWICK, and BAYLY.—May 20 and 21.

To remove the Girdler Light Vessel, examine Receiver, and report on new buoy.

Captains FARRER and WEBB.—May 20 to 22.

Committee to Rye, Dover, Deal, and Ramsgate.—Inspected the pilot cutter building at Rye; proceeded for Dover. 21st, inspected the new boats building, the store, "look out" tower, and the pilots on shore; proceeded to the office, and inspected the books, &c.; left for Deal, and inspected the pilots on shore, the "look out" house, &c.; attended at the office, and inspected the books; examined the sails, &c., for the cutter; proceeded for Ramsgate. 22d, inspected pilots, &c., and returned to London.

Captains SHUTTLEWORTH, FENWICK, BAYLY, and NISBET.—May 25 to 29.

Committee to the Westward.—Replaced the West Girdler Buoy, and put a new cage on the "Royal Sovereign" Buoy; landed oil and stores at Beachy Head, Portland, Casquets, and at Ramsgate, and brought away the empty tins, &c.; visited and inspected Dungeness and South Foreland, and returned to Blackwall on the 29th.

Captains WERE and WELLER.—June 2 to 5.

Relief duty.

Captains REDMAN and PINLEY, Rear-Admiral GORDON and Captain FENWICK.—June 9 to 16.

Committee to the Westward.—When off South Foreland a thick fog came on; returned, and anchored in the Downs. 10th, proceeded to Cowes; anchored, and landed stores; visited Needles new lighthouse, and anchored in Totland Bay. 11th, anchored off the Start; landed stores, and inspected the establishment. 12th, anchored off St. Agnes; landed stores, and inspected establishment; landed at the Bishop, and inspected the lighthouse. Monday, 14th, left St. Mary's Sound; visited the Seven Stones; unable to land at Sennen Cove and Godrevy; Longships telegraphed "all well;" landed Longships' stores at Penzance; left there, and anchored in the cove of Landerwednock; landed stores with much difficulty; inspected the Lizard establishment. 15th, coaled at Plymouth; put stores on board the tender; stopped off the Eddystone; took in the empty tins at the Start; arrived at Blackwall on the 16th.

Captains BAYLY, BAX, and PELLY.—June 17 and 18.

Committee to Harwich and Beach End.—Anchored abreast of Langard Fort. 18th, landed at Beach End; took angles, &c. at high and low water; sounded about Beach End buoy, and removed same into proper position; landed at Harwich; inspected tender; had an interview with Colonel Wulff, relative to erection of buildings at Beach End; proceeded; removed Girdler buoy into proper position, and arrived at Blackwall.

Captains CLOSE, WEBB, and NISBET.—June 9 to 23.

Committee to the Bristol Channel.—Weather thick and foggy; anchored for the night under Dungeness. 10th, proceeded, and anchored at Plymouth. 11th, coaled, and proceeded; stopped at the Longships; inspected lighthouse; made several experiments with lamp and reflectors, with a view to mark the Rundestone; bore up for Godrevy; inspected light vessel; landed on the island, and inspected building; anchored in St. Ives Bay; landed keepers' furniture, &c. 12th, proceeded to Trevoze; landed stores, and inspected establishment; proceeded to Landy; landed stores, and inspected establishment; pro-

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ceeded to Caldy; landed stores, and inspected the establishment; anchored off Tenby. Monday, 14th, sea too high to land at South Bishop; bore up for Dale Roads; landed stores at St. Ann's; visited establishment; proceeded to Nayland; selected a position for the moorings of coal hulk, &c.; landed, and selected place for store; anchored at Milford. 15th, weighed for Bristol Channel; weather becoming thick, with a fresh gale, anchored at Dale; took on board empty tins, and returned to Milford to coal; had an interview with solicitor to Colonel Greville, respecting the sale of the land at Milford. 16th, proceeded to Caldy; took in empty tins; supplied and inspected Helwicks Light Vessel; too much sea on to land at the Nash; proceeded to Flatholm; landed stores, and inspected establishment. 18th, proceeded to the Avon; examined Monkstone Rock; inspected the road at the Avon. 19th, visited Burnham and Usk; anchored, and coaled in Penarth Roads. 20th, inspected the "Satellite" tender, and proceeded; landed stores, received empty tins, and inspected the Nash establishment; proceeded to Bidford, inspected the establishment, and landed stores; proceeded to Lundy for empty tins; visited the north end of the island, to consider site for Fog signal; steamed close past the Longships, and examined effect of experimental lamp, &c. 21st, Sunday, anchored off Ryde. 22nd, proceeded, and anchored below Gravesend. 23d, at Blackwall.

Captains BAYLY, WERE, and DREW.—June 24 to 26.

Committee to Sea Reach and Canvey Island.—Anchored, and landed spars for the purpose of enlarging the beacon on Canvey Island. 25th, landed carpenters and seamen on the island; proceeded to Southend, and landed the second officer to attend the tide gauge; sounded in the channel, and took angles where necessary; proceeded for the Reculvers; landed stores, and returned to Sheerness; landed, and inspected the beacon. 26th, landed mechanics to finish the beacon; snaked the channel between the River Middle and Yantlett Shoal; proceeded to River Middle buoy to test appearance of beacon, and returned to Blackwall.

Captains REDMAN and CLOSE (with Professor FAIRBAY).—July 7.

Committee to Birmingham, to inspect apparatus for Whitty Lights at Messrs. Chance's works.

Captain BAYLY.—July 7 to 9.

Relief duty.

Captain BAYLY.—July 14.

Replacing the Nore Light Vessel.

Captains BAX, REDMAN, SHUTTLEWORTH, CLOSE, and NISBET.—July 14 to 24.

Committee of Inspection to Scilly and St. George's Channel.—Stopped at the Nore, and again abreast of the South Foreland, and observed relative power of dioptric and catoptric lights. 15th, called at Cowes; proceeded for Totland Bay; delivered lantern for Needles into "Tortoise" lighter; inspected Needles workshops; proceeded; thick fog off the Start. 16th, anchored in 13 fathoms; weather cleared, and proceeded; coaled at Mill Bay; proceeded for St. Mary's, Scilly, and landed apparatus for the "Bishop." 17th, delivered stores; weighed, and steamed round the "Bishop," but unable to land; proceeded for Milford; arrived there at 9:10 P.M. 19th, landed stores, and took in apparatus for improvement of South Bishop; landed at the Snalls; inspected the Pile Lighthouse and the Stone Tower building; steered for the dépôt at Solva, to land a heavy iron door for the tower; visited South Bishop, but were unable to land the apparatus; anchored in Figsward Bay. 20th, steered for Aberdovey; were unable to land; recommended alteration in beacon; inspected Bardsey; an-

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chored in Holyhead Harbour. 21st, visited buoy store; arranged with Captain Priest to take charge of signal gun; visited South Stack; inspected new dwellings; visited Rhoscollyn Beacon and Skerries Lighthouse; landed stores, anchored in Menai Straits. 22d, Menai Lighthouse inspected; stores landed; anchored in Bangor Roads; proceeded for Point of Air; Pile Lighthouse visited, and supplied with oil and stores; attention called to insufficiency of fog bell; dwellings visited; anchored in Hoyle Roads. 23d, landed at Millree Island; inspected buoy store and dwelling; anchored in Douglass Roads; buoy store visited; Bahama Bank Light Vessel visited; anchored in Whitehaven Roads; St. Bees Lighthouse and dwellings inspected. 24th, disembarked, and ordered steam vessel to return to Milford.

Captains BAYLY and DREW.—July 22 to 24.

Shifting the St. Nicholas Light Vessel.

Captains BAYLY, WEBB, WERE, and FENWICK.—August 3 to 5.

On relief duty.

Rear-Admiral GORDON, Captains BAX, REDMAN, OWEN, PIGOTT, and DREW.—August 3 to 13.

Committee to Cherbourg and Antwerp.—In attendance on Her Majesty, in conformity with ancient custom, and in accordance with the wish of H.R.H. the Master. 3d, left for Southampton; anchored off Osborne. 4th, Captain Pigott returned to town, being unwell. The "Irene" was directed to follow Her Majesty, the other vessels being ordered in advance; proceeded for Cherbourg. 6th, returned to Osborne Roads; Captain Denman communicated Her Majesty's pleasure that the "Irene" should accompany the "Victoria and Albert" on the 10th; proceeded to the eastward, and anchored in the Park. 7th, arrived at Blackwall. Monday, 9th, the Committee met on board at Blackwall (except Captain Redman, unwell). 10th, proceeded to Gravesend; joined the squadron, and left for the Scheldt; anchored off Flushing. 11th, proceeded up the Scheldt, and anchored off Antwerp; Her Majesty's pleasure was intimated that the "Irene" should be in readiness to accompany the "Victoria and Albert" on the return voyage on the 30th. 12th, anchored off Flushing. 13th, proceeded; replaced the cage of the East Blyth buoy, which had been fouled, and arrived at Blackwall.

Captain CLOSE, with Mr. BURGESS, C.E.—August 5 to 7.

To Lundy Island, to inspect the damage done to the lighthouse by lightning.

Captain BAYLY.—August 6.

To the West Blyth.

Captains CLOSE, PINXLEY, BAYLY, and NISBET.—August 11 to 21.

Committee to the East Coast.—When off Orfordness, commenced a comparison of the two lights; anchored in Yarmouth Roads. 12th, inspected the St. Nicholas Light Vessel, and put stores on board; proceeded to the Protector Shoal to place a buoy, but found the weather too hazy; anchored off Bridlington, and landed stores; inspected lighthouse at Flambrø Head; proceeded, and, being foggy, anchored off Kettleness. 13th, landed stores, &c., and inspected Tinnmouth Lighthouse and dwellings; coaled at Shields. 14th, landed chains and a buoy, and inspected the store at Seaton; visited the beacon on the Bran Sand, and the buoys; landed, and inspected the lighthouses building at Whitty, and anchored off Scarborough. Monday, 16th, discovered the buoy off Filey Brig to be out of place; took bearings, &c.; landed at Flambrø Head, to inspect the gate and road; took on board empty tins at Bridlington; laid the buoy on the Protector Shoal, and anchored in Hawk Roads. 17th, landed stores, and inspected the

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Spurn lighthouses and groynes : took on board empty tins, and inspected the Spurn Light Vessel ; steered for the Protector Shoal, to verify the angles : found it to be too lazy ; inspected the Lynn Well Light Vessel ; anchored off Hunstanton ; landed, and inspected the establishment. 18th, anchored alongside the Protector buoy ; verified the marks, &c. ; inspected the Dudgeon Light Vessel ; anchored off Cromer ; visited the lighthouse ; inspected the Haibro' establishment. 19th, visited the Haibro', Leman and Ower, and Newarp light vessels ; examined into the circumstances of the loss of the carpenter of the latter vessel, and into the subject of the Leman parting from her moorings ; anchored at Winterton, and inspected the establishment ; landed at Yarmouth ; visited the store, &c. 20th, visited the St. Nicholas and Stanford light vessels ; landed at Lowestoft, and inspected establishments ; landed at Pakefield, to investigate obstruction to the light ; anchored at Harwich, and visited the lighthouses. 21st, strong breeze ; unable to visit the Gunfleet ; arrived at Blackwall.

Captains WERE and FENWICK.—August 17 to 24.

Committee to "Pakefield Gat."—Anchored near the Cork Light. 18th, proceeded to the North Barnard buoy ; sounded through the Gatway to the southward ; snaked across the channel ; moved the South Newcome buoy ; placed a new buoy, to be called the S.W. Newcome ; landed at Pakefield, to adjust the light for the Gatway ; returned, and anchored in the Gatway, to try the light ; landed to effect a little alteration, and again returned to the Gatway. 19th, landed again, to inspect the light ; proceeded for Orfordness ; sounded at the Sizewell Bank and at Aldbro' Ridge ; moved the buoy ; sounded about the Napes, and snaked across it ; found the N.E. Whiting buoy out of position ; gave instructions for its alteration ; sounded about the heads of the Sand, and on the S.W. Bawdsey, over the Kettlebottom, and on to the S.W. Shipwash ; repainted the latter buoy, and entered Harwich Harbour. 20th, visited the Shipwash Light Vessel ; too much sea to get correct soundings ; sounded inside the Shipwash to the middle buoy, and bore up for the Wallet ; anchored at the entrance of the Colne : weather clearing, proceeded for the Blackwater, and anchored near Osy Isle. 21st, proceeded down the river ; passed between the Eagle and Knowle, and through the Swin Spitway ; sounded about and over the middle on the Heaps ; a heavy sea getting up, anchored in the Whitaker Channel ; proceeded for Harwich Harbour. Monday, 23d, proceeded, and examined the West Rocks and Gunfleet ; proceeded up the Medway ; turned in Limehouse Reach, observing marks, and passed Garrison Point, down over the Flat of the Cant, through the five fathom and about the Ooze and Nob channels : past the East Spaniard, across to the Gillman, Shivering Sand, and through the Nobs ; passed the East Ooze, and anchored to the westward of the River Middle buoy, and arrived at Blackwall on the 24th.

Captains BAX and DREW.—August 25 to 28.

Shifting the St. Nicholas Light Vessel.

Captains BAX, CLOSE, WEBB, and NISBET.—August 27 to 31.

Committee to and from Antwerp.—In attendance on Her Majesty. Left Blackwall, and anchored at Antwerp the same day ; reported arrival on board Royal yacht. On the 30th Her Majesty the Queen embarked on board the Royal yacht, the "Irene," proceeded down the Scheldt, and brought up about six miles above Flushing. Proceeded to Flushing, to land a Queen's messenger, and returned with him to the Royal yacht. 31st, sent "Irene's" pilot on

board Royal yacht, and stood down the Scheldt in company ; anchored in Dover Roads ; her Majesty landed at Dover ; Committee parted company with the Royal yacht, and proceeded for Blackwall.

Captains WELLER, WERE, and BAYLY.—August 31 to September 3.

Committee to the South Channels.—Left Blackwall ; shifted the East Blyth buoy. 1st September, sounded through the Prince's Channel ; shifted the South Girdler buoy ; sounded over the Girdler Spit, and moved the buoy ; sounded in the Queen's and Horse channels. 2nd, sounded through the Gulls and over the South Brake and Bunt Head, and shifted the South Brake buoy. 3d, the weather too unsettled to get soundings outside the Goodwin Sands ; proceeded for Blackwall.

Captains WELLER, REDMAN, OWEN (up to the 15th), SHUTTLEWORTH, DREW, and BAYLY.—September 9 to 17.

Committee to the Westward, and to observe and report upon the comparative practical advantages which the dioptric and catoptric systems of illuminations present in those stations where they are placed in immediate juxtaposition.—Left Blackwall ; proceeded to the South Foreland, and commenced observations on the lights ; took angles, &c. ; endeavoured to compare Beachy Head and Grinsez, but the state of the atmosphere prevented seeing clearly. 10th, made fast to the buoy in Cowes Roads ; delivered stores for the new Needles light ; coaled in Mill Bay. 11th, visited St. Anthony's Lighthouse ; tested the position of the beacons off the Rundlestone ; unable to land at the Longships or Sennen Cove ; anchored at St. Ives ; inspected Mr. Herbert's monster beacon. 13th, landed, and inspected the tower, &c., on Godrevy Island ; inspected the Godrevy Light Vessel ; unable to land at the Longships ; visited the storehouse, &c. at Sennen Cove ; proceeded for Scilly ; inspected the Bishop Lighthouse ; visited the dwellings at St. Mary's. 14th, inspected St. Agnes Lighthouse ; visited Mr. Augustus Smith, for the purpose of arranging the terms, &c. for the occupation of his premises at St. Mary's ; landed a supply of oil and water at the "Bishop." 15th, moored in Mill Bay, and coaled ; visited the Breakwater Lighthouse, and proceeded ; again tried to see Beachy Head and Grinsez lights at the same time, but failed to do so. 16th, anchored in Ramsgate Roads ; steered for Orfordness, and proceeded to make observations on those lights ; proceeded through Holesley Bay, and anchored off the Cork Light Vessel. 17th, weighed, and proceeded southward and arrived at Blackwall.

Captains WERE and NISBET.—September 16 to 18.

Committee to Harwich.—Stopped off the Beach End ; sounded over it, and placed a boat with a light on the Spit, to cut the Landguard Fort and Harwich Lights. 17th, moved the Beach End buoy ; proceeded to Woodbridge Haven, and approved of the new beacons for the new swatchway opening to the northward ; laid a bell buoy near the Maplin Spit ; anchored in the Gore Channel. 18th, proceeded outside the Goodwin Sands, and took soundings ; anchored in St. Margaret's Bay ; visited the South Foreland lighthouses, and proceeded for Blackwall.

Captains WERE, FENWICK, and NISBET.—September 21 to 25.

Committee to Yarmouth.—22d, joined the "Beacon" in the harbour ; too much wind to proceed to sea ; visited the store, &c., and the Newarp Light Vessel under repair. 23d, proceeded out of harbour ; sounded through the Cockle Gatt, round the Scroby, and out Hewitt's Channel, outside the Cross Sand, over the flat of the Newarp, across the Kettlebottom, through the

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east side of the Stanford Channel and Pakefield Gat, and anchored in Lovestoft Roads. 24th, weighed, and sounded over the Inner Shoal, through the west side of the Stanford Channel, and to the southward; anchored at Pakefield near the lighthouse, and visited the light; passed out through the inner channel between the Inner Barnard and Covehithness buoys; at the Sizewell Bank buoy compared Orford low and high lights; stood to the east-north-east about four miles, just dipping the low light, then to the south-west, west and north-west; anchored in Hoseley Bay. 25th, proceeded for Harwich, and returned to London.

Captains REDMAN, BAYLY, and NISBET.—Sept. 28 to October 6.

Committee to Whitby, &c.—Examined Orford lights, with reference to relative value of catoptric and dioptric systems. 29th, laid a wreck buoy near the Dudgeon; anchored in Whitby roads; landed, and visited the new light-houses. 30th, the stores and light-keepers' luggage were landed, and despatched to the light-houses, which were again visited, and instructions given for lighting up on the evening of the following day. 1st October, proceeded for Coquet Island and the Fern Islands; unable to land; blowing very hard; anchored in Skate Roads. October 2d, landed, and inspected the inner and outer Fern Light-houses; inspected the lighthouse and buoy store at Coquet; proceeded, and anchored in Whitby Roads; weighed, and commenced observations on the lights. Monday 4th, landed, and had an interview with the owner respecting the use of a spring of water for the lighthouse establishment; visited the light-houses when lighted; weighed, and stood towards the Whitby Rock buoy, on which a lantern had been placed; took bearings, &c.; made further observations on the lights. 5th, anchored off Haisbro'; inspected the light-houses, &c.; inspected the Winterton; proceeded for Yarmouth; inspected the Newarp Light Vessel, and arrived at Blackwall on the 6th.

Rear-Admiral GORDON, Deputy Master, Captains WELLES, BAX, PIGOTT, and DREW.—From October 13 to 16.

Committee to Harwich.—The weather being thick, anchored off the Gunfleet. 14th, anchored off Orfordness; landed, and examined the lantern of the high light; inspected both establishments; proceeded for Harwich; visited the Cork Light Vessel; sounded round the Beach End; placed two boats to mark the channel; landed, and selected sites for the proposed Dovercourt Lights; proceeded out of harbour to examine position, &c.; anchored inside the Beach End; landed, and fixed upon a spot on the beach for exhibiting a light instead of the one in Langard Fort; brought up off the town. 15th, anchored near the Beach End buoy; boats sounded round the Beach End; stood out past the Andrews, sounding the channel; returned, and again examined the site near Dovercourt; weighed, and proceeded up Swin; observed that the experimental bell buoy near the Maplin had received a blow, and did not work; unshackled it, and moored it astern of the Mouse Light Vessel for the night; anchored off the pier at Margate, and visited the lighthouse. 16th, weighed, and proceeded to the Mouse; took the Bell buoy in tow for Blackwall.

Captains CLOSE, BAYLY, FENWICK, and NISBET.—October 13 to 22.

Committee to the Needles, &c.—Left Blackwall with the lighting apparatus for the Needles Lighthouse and the lantern and apparatus for Godrevy. 14th, anchored in Totland Bay; discharged the lighting apparatus, and proceeded. 15th, anchored in St. Ives Bay; landed the buoys for the Bristol Channel and cases for Godrevy.

16th, too much sea on to land at the Longships; landed and inspected the store and dwellings at Sennen Cove; proceeded to Scilly; anchored in St. Mary's Pool, and commenced landing the plank for the dwellings; inspected the dwellings in process of erection. Monday 18th, and 19th, taking on board the chains, stores, &c. at St. Mary's. 20th, weighed and proceeded; passed inside the Rundlestone; passed the Lizard, and steered for and examined the Manacles; arrived at Millbay, and coaled. 21st, too much sea on to land at the Start; passed Portland; consider it necessary to have a light ship placed on the eastern end of the Shambles; landed at the Needles Lighthouse; arrived at Blackwall on 22d.

Captains WERE and WEBB, October 21 to 23.

Committee to the Horse Channel.—Anchored off the "Girdler." 22d, proceeded down the Prince's Channel for the Horse Channel; dropped a temporary buoy off the South Spit, Margate Sand; placed a tide gauge at the Hook Beacon; sounded, and laid a temporary buoy for the South Margate, which buoy was found out of position; moved it; placed a black buoy close to the Spit of Margate Sand; took angles and bearings; placed a red buoy for the Reculvers buoy; removed the Gore Patch buoy; moored the East Last buoy; replaced the Middle Last buoy; sounded between Margate Hook Beacon and the Reculvers buoy; took angles, &c. 23d, proceeded in the cutter; sounded and took angles, &c. between Margate Hook Beacon and the Reculvers Buoy; after sounding through the Horse Channel, and laying the Middle Last buoy, proceeded up the river to Blackwall.

Captains REDMAN and DREW.—October 21 to 26.

Committee to the Whitby Light-houses.—At Whitby on 22d, and having verified the bearings, and the red shades being completed, made arrangements for their exhibition; proceeded out of harbour in a tug, northward, and examined the appearance of the lights. 23d, visited the light-houses, and the red shades were fitted in the Northern Light-house; in the evening again proceeded in the tug northward to observe the lights. Monday 25th, again visited the light-houses; had an interview with the Harbour Commissioners respecting the pier lights; left Whitby, and arrived in London on the 26th.

Captains DREW and WEBB.—November 3 to 5.

Committee to Deal, &c.—In the evening visited the South Foreland Lighthouse. 4th, attended at Deal, to hear the objections of the pilots to certain proposed regulations. 5th, again visited the South Foreland establishment, to examine progress made for the exhibition of the magneto-electric light.

Captains WERE, FENWICK, and NISBET.—Nov. 9 to 11.

Committee to Stanford Channel.—Proceeded to Lowestoft. 10th, embarked there, and proceeded for the Stanford Channel; sounded through the channel and about the South Holm buoy; moved the East Newcome buoy; sounded in the Pakefield Gat, at the South Newcome and North Barnard buoys; proceeded to Yarmouth. 11th, proceeded through the Cockle Gatway; sounded round the head of the Scroby; sounded over the north end of the Cross Sand and along the eastern edge; proceeded for Yarmouth, and returned to London.

Captain BAYLY.—Nov. 10 to 13.

Shifting the Royal Sovereign buoy.

Captains CLOSE and BAYLY.—Dec 1 to 4.

To the Prince's Channel and Sheerness Middle buoy.

Rear-Admiral GORDON, D.M., Captains WELLES, FARRER, and WERE (with Mr. FARADAY).—Dec. 8 and 9.

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VIII.

VIII, IX.

CONSTITUTION OF GENERAL AUTHORITY, &c.

X, XI.

Committee to the South Foreland to observe the magneto-electro light.

Captains OWEN, FENWICK, BAYLY, and WEBB.—
Dec 9 and 10.

Committee to the South Foreland to observe the magneto-electric light.

Captains PIGOTT, SHUTTLEWORTH, DREW, and PELLY.
Dec. 10 and 11.

Committee to the South Foreland to observe the magneto-electric light.

P. H. BERTHON,
Secretary.

Trinity House, London,
7th January 1860.

days and at the hour appointed for the meeting of each respective Committee, shall forfeit the sum of ten shillings.

At a General Court held by adjournment on the 23d October 1823 it was resolved—

That an Elder Brother not present at an adjourned Court at the hour of meeting shall forfeit the sum of forty shillings.

Trinity House,
18 .

Secretary.

TRINITY HOUSE, LONDON.
LIGHTHOUSES, &c.

X. Gross Income for the Years 1857, 1858.

In the Year ending 31st December.	Gross Amount of Light Duties collected.	Repayment of Light Duties.	Net Amount of Light Duties collected.	Miscellaneous Receipts, Proceeds of Sale of Old Stores, &c.	Gross Income.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1857	268,540 5 4	724 15 4	267,624 10 0	1,021 8 7	268,645 18 7
1858	256,016 10 11	893 27 8	255,122 13 3	2,691 5 0	257,213 18 3

Gross Expenditure for the Years 1857, 1858.

In the year ending 31st December 1857	£ s. d.
Do. Do. Do. 1858	204,013 8 2
	172,285 0 6

Trinity House, London,
7th January 1860.

P. H. BERTHON,
Secretary.

IX.

RETURN TO REQUISITION, dated 27th May 1859.
QUESTION IX. "Standing Orders for the guidance of Board and Committees."

There are no other standing orders for the guidance of Board and Committees than the regulations described under section 5, as the division of the duties of the Elder Brethren, but the annexed resolutions in regard to fines for non-attendance are submitted for the information of the Commissioners.

P. H. BERTHON,
Secretary.

Trinity House, London,
24th December 1859.

At a General Court held on 7th November 1822 it was on the recommendation of the Special Committee Resolved,—

That each merchant Elder Brother who may be absent at the hour appointed for the meeting of the Courts of the Corporation shall forfeit the sum of forty shillings.

That such Brethren as may be absent on the days and at the hour appointed for the Audit or Accounts shall forfeit the sum of forty shillings.

That such Brethren as may be Members of Committees or Supervisors of the Ballast Office, and are absent on the

RETURN TO REQUISITION dated 27th May 1859 (2). Detailed account of Expenditure 1857, 1858.

XI.

DETAILED ACCOUNT OF EXPENDITURE in respect of LIGHTHOUSES, &c. by the Corporation of Trinity House, London, in the Year ending 31st December 1857.

	£	s.	d.
Lighthouses; cost of maintenance and repair, as per Statement A.	-	-	34,148 9 3
Floating lights; do. do. as per Statement B.	-	-	40,491 0 3
Buoys and beacons; do. do. as per Statement C.	-	-	5,682 10 5
Steam and sailing vessels, district superintendents, storehouses, &c., as per Statement D.	-	-	42,633 5 11
Office and house expenses; repairs, &c. to the house and offices on Tower Hill, wages to gatekeeper, watchman, and domestic servants, stationery, advertisements, postage, &c.	-	-	4,150 10 4
Salaries of establishment; to the Elder Brethren, and to the secretary and clerks in the establishment on Tower Hill, to the civil engineer, clerk of works, surveyor of shipping, &c.	-	-	13,135 10 8
Miscellaneous expenses; law charges, sundry annuities on private lights, &c., expenses of committees of inspection, and travelling charges generally	-	-	4,018 12 4
Expenses of collection; commission to those collectors at ports in England, whose appointments were made previously to April 1854, and to those at Cowes, Deal, and Falmouth, and incidental expenses at Runcorn and Gibraltar (those at other ports being paid through the Board of Trade)	-	-	2,817 3 8
Superannuation allowances to retired officers of the official establishment and lighthouse, &c. service generally	-	-	7,534 15 4
Charities and pensions; allowances to pensioners on the Corporation's Charitable Funds granted previously to 1st October 1853	-	-	14,755 12 10
New works; advances and payments on account of works in progress at the Bishop, Needles, Smalls, and Crow Rocks, and at High Whitby	-	-	34,645 12 7
(E. E.)			<u>£204,013 8 2</u>

Trinity House, London, 4th February 1860.

P. H. BERTHON, Secretary.

DETAILED ACCOUNT OF EXPENDITURE ON LIGHTHOUSES, in the Year ending 31st December 1857.

Statement A.

LIGHTS.	Wages and Allowances.	Rents.	Coals and Fuel.	Carriage of Oil and Stores.	Boat Hire and Assistance.	Repairs.		Incidentals.	TOTAL.
						Ordinary.	Special.		
<i>a</i> Fern	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Coquet	257 5 0	-	42 16 10	6 3 4	32 17 0	61 5 4	139 5 8	14 17 3	594 10 6
Tinmouth	110 0 0	23 16 0	-	1 9 2	-	8 0 0	87 16 4	2 10 7	250 0 1
Flamboro'	125 0 0	-	14 4 0	4 17 8	-	13 17 6	67 3 4	0 15 5	223 17 0
<i>b</i> Spurn	94 5 0	-	34 0 0	7 5 9	5 11 5	15 10 0	78 17 2	0 17 3	219 16 5
Hunstanton	155 0 0	102 0 10	32 12 0	3 5 5	-	41 15 2	1,502 1 11	6 16 2	1,842 18 2
Cromer	110 0 0	-	18 15 0	1 16 4	-	16 10 0	-	4 4 0	150 16 2
<i>c</i> Haisbro'	140 0 0	-	17 10 4	5 19 6	-	10 0 9	-	0 15 9	174 6 4
Winterton	275 0 0	0 14 8	29 13 4	-	-	27 11 6	451 9 3	1 3 1	777 11 10
<i>d</i> Lowestoft	140 0 0	-	23 8 0	5 3 2	1 1 0	3 0 5	72 13 2	0 17 7	284 3 4
<i>e</i> Pakefield	175 0 0	0 12 0	28 14 6	1 19 9	-	56 19 0	86 10 6	1 1 3	350 17 0
<i>f</i> Orford	110 0 0	0 16 4	26 7 0	0 8 0	-	37 2 6	-	4 1 4	178 15 2
<i>g</i> Harwich	221 10 0	-	40 5 0	1 1 0	7 6 4	76 7 10	63 2 9	2 1 3	443 11 2
<i>h</i> Landguard Fort	155 0 0	1 0 0	14 7 6	-	-	37 8 3	233 12 6	1 17 8	443 5 11
<i>i</i> Mucking	83 10 0	-	3 6 0	-	-	1 10 3	-	91 5 10	225 14 0
<i>k</i> North Foreland	-	1 1 6	19 7 0	2 1 0	-	10 13 7	596 18 4	0 4 6	740 6 11
<i>l</i> South Foreland	200 0 0	9 7 1	33 0 0	5 9 0	-	48 14 0	40 0 0	1 0 0	337 10 1
Dungeness	110 0 0	-	43 3 0	1 7 4	-	14 5 4	89 12 5	0 6 9	238 14 10
Beauch Head	150 0 0	0 5 0	32 18 0	7 6 10	-	106 15 3	2 4 11	13 14 1	312 2 3
<i>mst.</i> Catherine's	110 0 0	0 9 6	25 9 0	0 7 9	-	28 2 0	-	0 14 0	165 2 3
Needles	110 0 0	-	34 14 6	7 13 10	-	28 11 3	-	1 8 11	182 8 6
<i>n</i> Hurst	155 0 0	-	32 4 0	0 1 10	-	17 15 9	-	0 5 1	203 6 8
<i>o</i> Portland	220 0 0	2 10 0	77 13 3	12 2 7	-	13 12 10	924 15 5	0 8 6	1,251 2 7
Falmouth Harbour	110 0 0	-	21 15 0	2 17 10	-	26 19 5	91 5 10	0 18 9	253 17 2
<i>p</i> Lizard	185 0 0	0 10 2	24 13 0	9 13 9	-	30 11 4	-	0 5 1	250 13 4
<i>q</i> Scilly	110 0 0	19 10 0	18 2 0	8 11 5	-	3 10 10	-	0 18 0	157 4 9
<i>r</i> Tresco Head	110 0 0	-	43 3 0	1 7 4	-	92 11 6	-	0 4 9	229 5 0
<i>s</i> Lundy	111 10 0	-	19 2 6	-	25 0 0	69 14 10	1,414 10 8	0 19 3	1,692 19 0
<i>t</i> Burnham	110 0 0	18 0 0	15 18 8	2 19 4	0 6 6	58 7 5	66 19 4	7 5 2	279 16 6
<i>u</i> Avon	110 0 0	2 4 10	15 3 0	0 1 6	-	5 8 6	-	0 10 1	200 0 0
Usk	100 12 4	0 6 8	24 15 0	5 2 7	-	38 12 7	78 14 1	1 9 6	249 12 7
<i>v</i> Flat Holm	110 0 0	0 2 8	15 7 6	2 12 0	2 13 10	43 5 4	104 2 6	1 2 9	278 12 7
<i>w</i> Nash	153 12 0	0 4 0	32 18 0	7 5 0	-	30 3 4	-	1 9 6	227 3 7
<i>x</i> Cally	150 0 0	-	19 16 0	0 10 5	20 0 0	18 12 8	-	1 4 8	210 3 9
<i>y</i> Milford	155 0 0	-	49 9 0	2 7 9	-	47 16 6	-	0 15 8	265 8 11
<i>z</i> Bardsley	114 0 0	-	39 16 3	3 5 1	7 8 0	38 12 3	1,702 14 3	1 4 8	1,966 4 9
<i>aa</i> South Stack	110 0 0	91 3 6	4 6 0	0 18 0	6 7 0	65 1 11	1,001 9 8	0 11 9	1,316 17 7
<i>bb</i> Skerries	127 10 0	0 2 6	44 0 0	0 12 0	55 2 6	82 5 6	-	40 14 0	350 6 6
<i>cc</i> Gullnet	110 0 0	-	46 3 0	0 17 0	-	87 0 0	-	1 12 1	225 14 1
<i>dd</i> Air	117 15 0	5 3 0	26 2 1	6 5 1	-	24 8 2	20 17 6	2 13 6	203 4 5
<i>ee</i> St. Bees	110 0 0	0 1 5	21 1 4	3 3 2	-	39 10 3	70 19 3	0 8 7	245 4 0
<i>ff</i> Guisard	238 2 6	-	5 15 0	-	-	29 12 8	-	1 1 8	266 8 8
<i>gg</i> Maplin	238 2 6	-	-	-	-	35 0 0	10 19 6	13 4 5	238 2 6
<i>hh</i> Chapman	238 2 6	-	-	-	-	9 0 0	10 19 6	-	238 2 6
<i>ii</i> Caskets	344 0 0	5 0 0	14 0 2	1 10 8	33 14 0	65 6 3	1,740 9 11	6 11 4	2,260 12 0
<i>jj</i> Plymouth Breakwater	190 0 0	-	4 19 6	0 1 0	-	12 8 0	-	0 13 7	208 2 1
<i>kk</i> Edystone	316 10 0	-	7 9 6	0 1 1	-	6 11 0	-	2 2 5	332 16 9
<i>ll</i> Longships	336 10 0	5 0 0	22 11 0	-	44 2 0	23 1 11	640 0 0	2 3 2	1,103 9 1
<i>mm</i> Smalls	315 0 0	5 3 10	7 8 0	1 14 6	10 0 0	29 11 1	-	0 13 7	358 8 3
<i>nn</i> South Bishop	238 2 6	-	12 17 9	0 5 7	22 10 0	18 8 4	-	0 2 10	292 7 0
<i>oo</i> Heligoland	153 5 1	0 12 0	33 16 4	8 2 2	-	37 2 8	-	3 9 1	276 5 1
<i>pp</i> Gilbert	186 13 0	-	-	6 19 1	-	91 16 8	-	10 16 8	226 11 4
<i>qq</i> Superannuated Lightkeepers	275 15 10	-	-	-	-	-	-	-	275 15 10
Total	£9,037 19 4	299 1 0	1,241 9 9	178 18 6	323 19 7	1,937 0 7	11,566 11 6	159 3 3	24,744 3 6
Proportion of general stores, oil, wicks, &c. supplied to the Buoy Wharf at Blackwall for use of this branch of the service									
									9,176 17 4
Paid expenses connected with establishment and maintenance of a fog-signal battery and gun at South Stack									33,921 0 10
									227 8 5
Total									£34,148 9 3

REMARKS.

a Fern.—Three lighthouses.
b Spurn.—Two lighthouses; £1,502. 1s. 11d., expended for repair of sea defences.
c Haisbro'.—Two lighthouses; the sum of 451l. 9s. 3d., is for works in strengthening the towers and improving keepers' dwellings.
d Lowestoft.—Two lighthouses.
e Pakefield.—No revenue; maintenance chargeable on the tolls collected for Lowestoft.
f Orford.—Two lighthouses; 63l. 2s. 9d. for whitewashing, limewashing, &c.; no revenue; maintenance chargeable on the tolls collected for Winterton.
g Harwich.—Two lighthouses. Amount of 233l. 12s. 6d.; 170l. is for building a wall, the remainder for painting the establishment.
h Landguard Point.—Light exhibited from a window in the curtain bastion of the fort; no revenue; maintenance chargeable on the tolls collected for Harwich.
i Mucking.—£94. 5s. 10d., repair of bell and for paint.
k North Foreland.—£56l. 1s. 8d.; part cost of new dwellings for keepers.
l South Foreland.—Two lighthouses; 40l. is for balance of cost for building new dwellings for the keepers.
mst. Catherine's and Hurst Lights.—No revenue; maintenance chargeable on the tolls collected for the Needles.
n Hurst.—Two lighthouses.
o Portland.—Two lighthouses; 924l. 15s. 5d., part cost of new dwellings for keepers.
p Lizard.—Two lighthouses.
q Tresco Lights; 2 light towers.
r Lundy.—£1,414. 10s. 8d., part cost of a new catadioptric apparatus of the 1st order, and charges for works rendered necessary by a land-lip.

s Bideford.—Two lighthouses, one moveable; they are both built of wood and the sum of 15s. entered under the head of "Rents," is for insurance (two years).
t Burnham.—Two lighthouses.
u Avon Light.—No revenue; maintenance chargeable on the tolls collected for the Bristol Channel Floating Light.
v Nash.—Two lighthouses.
w Milford or St. Ann's Point.—Two lighthouses.
x Bardsley.—£1,702. 14s. 3d., a new 1st order catadioptric apparatus, improving keepers' dwellings, and painting establishment.
y South Stack.—£1,001. 9s. 3d., part cost of new dwellings for keepers.
z Caskets.—Three light towers; 1,740l. 9s. 11d., is for part cost of new dwellings for the keepers, and for alterations to the lanterns.
aa Plymouth Breakwater Light.—No revenue; maintenance chargeable on the tolls collected for the Edystone.
bb Longships.—£540. is part cost of new dwellings for the keepers.
cc The amount set down as special repairs to each of the under-mentioned lights is the cost of periodical painting of the establishments:—
 Fern. Dungeness. Flat Holm.
 Coquet. Start. St. Bees.
 Flambroro'. Bideford. Maplin.
 Avon. Winterton. Chapman.
 Usk.
 The under-mentioned stations are outlying or rock stations at which the keepers have an allowance of 1s. 6d. per day per man for victualling in addition to their wages:—
 Maplin. Edystone. South Bishop.
 Chapman. Longships. Gunfleet.
 Caskets. Smalls.

DETAILED ACCOUNT OF EXPENDITURE ON LIGHTVESSELS, in the Year ending 31st December 1857.

Statement B.

LIGHTS.	Wages and Allowances.	Rent.	Coal and Fuel.	Carriage of Oil and Stores.	Repairs.		Incidentals.	TOTAL.
					Ordinary.	Special.		
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Spurn	743 11 0	-	10 12 3	-	33 17 5	-	1 17 0	790 0 8
Dudgum	729 11 6	-	10 8 9	-	27 9 3	-	3 16 6	771 6 0
Lynn Well	743 12 3	-	10 12 3	-	46 0 0	-	4 8 3	804 9 6
Leam and Ower	730 11 6	-	10 12 3	0 2 6	71 11 1	-	4 0 1	816 17 5
Halsbro'	730 11 6	-	10 8 9	-	45 7 7	-	4 17 7	791 7 5
Cockle	729 11 6	-	10 8 9	-	50 17 10	122 10 0	12 8 3	925 12 0
Newarp	729 11 6	-	10 8 9	-	58 10 2	9 17 0	1 8 5	809 15 10
St. Nicholas Gatt	729 11 6	-	10 5 3	-	51 5 11	301 15 3	1 19 4	1,134 17 3
Stanford	729 11 6	-	10 12 3	-	10 12 3	-	-	750 0 0
Shipwash	723 15 4	-	9 4 0	-	101 8 4	454 1 11	1 14 2	1,332 3 9
Cork Ledge	731 6 0	-	9 4 0	-	46 1 10	452 2 11	-	1,273 14 9
Gallopier	741 19 7	-	6 6 0	-	34 18 1	531 1 0	1 18 -	1,316 2 9
Keating Knock	745 4 0	-	6 6 0	-	22 8 11	-	-	752 11 2
Sunk	724 3 3	-	9 15 6	-	103 18 7	301 8 5	1 8 0	1,140 13 9
Princes Channel	744 11 6	-	6 6 0	-	62 10 3	370 2 11	1 6 5	1,184 18 1
Swin Middle	742 5 6	-	6 6 0	-	30 6 5	132 16 0	1 12 1	322 7 10
Mouse	743 11 6	-	6 6 0	-	26 0 5	-	1 9 8	777 7 7
Nore	754 3 6	-	6 6 0	-	50 7 7	-	-	810 17 1
Girdler	747 12 6	-	6 6 0	-	107 8 1	294 11 2	1 6 3	1,157 4 1
Tonmar	743 1 10	-	6 6 0	-	32 9 11	-	1 17 5	783 14 2
G. Godwin	732 16 0	-	11 15 0	-	87 8 1	4,781 6 1	0 17 10	5,614 3 0
J. Gull	739 6 0	-	14 2 0	0 3 4	33 14 6	-	14 1 0	801 5 10
South Sand Head	723 6 4	-	14 2 0	-	23 3 10	-	1 10 0	761 0 2
Owers	725 0 6	-	12 7 6	0 11 1	31 8 5	-	1 10 6	779 8 0
Bembridge	733 3 0	-	13 18 6	-	49 9 5	518 7 5	3 16 4	1,320 15 4
Warner	728 10 6	-	13 0 0	0 10 0	39 12 2	-	3 0 0	784 12 8
Cal-hot	725 18 0	-	12 8 6	0 3 5	12 4 1	-	4 13 3	756 7 3
Seven Stones	1,136 13 0	-	4 13 0	1 5 0	17 12 4	143 10 3	38 7 10	1,372 2 5
English and Welsh Grounds	730 16 7	-	8 6 6	0 3 2	21 6 3	-	1 12 1	759 9 9
Helicks	730 16 7	-	10 11 10	5 10 7	78 17 4	-	3 1 11	828 8 6
Bahama Bank	730 13 6	-	11 5 0	50 0 0	23 9 4	-	7 10 1	824 17 11
Spare or substitute Vessels at—								
Yarmouth	-	-	4 5 6	-	68 16 9	-	0 2 6	73 4 9
London	-	-	6 9 6	0 5 4	67 11 10	707 7 8	0 2 6	775 0 2
Milford	72 6 3	-	6 9 6	0 5 4	16 10 0	-	-	95 11 1
	£ 23,237 10 5	-	312 2 1	84 4 9	1,704 16 0	9,200 19 1	149 1 3	34,662 13 7
Proportion of general stores, oil, wicks, paints, spare globes, and moorings supplied to the Buoy Wharf at Blackwall for the service of this Department								5,823 6 8
								£ 40,491 0 3

REMARKS.

- a Newarp.—No revenue; maintenance chargeable on the tolls collected for Halsbro' lighthouses; special repairs not completed until 1858.
- b Stanford.—No revenue; maintenance chargeable on the tolls collected for Lowestoft lighthouses.
- c Gallopier.—No revenue; maintenance chargeable on the tolls collected for the Sunk Light.
- d Swin Middle.—Special repairs not completed until 1858.
- e G. Godwin.—The special repairs 4,781l. 6s. 1d. include part cost of a new iron vessel for that station.
- f Gull.—No revenue; maintenance chargeable on the tolls collected for Goodwin.
- g Bembridge.—No revenue; formerly maintained by the Admiralty; transferred to the Trinity House under Act 6 & 7 Will. IV. cap. 79.
- h Seven Stones.—Special repairs not completed until 1858.
- i Warner.—No revenue; 370l. per annum paid by the Admiralty for maintenance of the vessel, the wages, &c. of the crew, and maintenance of the light being borne by the Mercantile Marine Fund. Each crew consists of eleven men, except that at the "Seven Stones," which consists of seventeen men.

DETAILED ACCOUNT OF EXPENDITURE ON BUOYS AND BEACONS, in the Year ending 31st December 1857.

Statement C.

STATION OR DISTRICT.	Salary to Buoy Keeper.	Rents, &c.	Boat Hire and Assistance.	Repairs to Buoys and Fittings, New Buoys, &c.	Incidentals.	TOTAL.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
a Buoys off Coquet Island	35 0 0	-	7 17 0	71 13 8	-	114 10 8
" in the River Tees	100 0 0	-	145 16 0	130 13 0	16 14 6	391 3 6
" off Yarmouth	-	-	2 14 0	859 8 10	60 6 6	922 12 4
b " and beacons in Woodbridge Haven	10 0 0	-	6 0 0	14 18 0	5 0 3	35 18 3
" off Harwich	-	6 0 0	-	263 8 3	11 11 7	269 19 0
" and beacons in the Channel leading to the River Thames and the Port of London.	-	-	-	1,319 10 9	3 14 0	1,323 4 9
Reculvers Church Towers	10 0 0	-	-	6 19 7	0 6 8	17 6 3
c Buoys and beacons at Heligoland	-	-	14 6 8	7 14 1	2 0 6	24 3 3
" off Ramsgate	-	-	31 0 0	290 0 0	3 17 0	324 17 0
e " in the Loos Stream	-	-	-	1 19 6	0 6 0	2 5 6
f " off Plymouth	-	-	0 10 0	2 7 6	4 7 0	7 4 6
g " at Exmouth	25 0 0	0 10 0	1 11 6	91 11 4	0 16 0	119 8 10
" at Bidford	10 0 0	14 0 0	14 2 0	31 15 0	1 5 0	71 2 0
A " in the Usk	-	-	-	9 2 1	-	9 2 1
" and beacons in the Bristol Channel	-	77 2 0	6 6 0	328 1 4	6 15 1	417 5 7
" in St. George's Channel	-	-	5 13 0	55 11 1	5 16 6	107 0 7
" in the River Conway	12 0 0	6 0 0	18 7 4	18 1 1	0 11 5	55 8 10
" at Garmarthen	20 0 0	9 5 0	26 1 6	42 0 2	1 5 10	96 6 6
" at Aberdovey	5 0 0	2 0 0	3 6 8	9 10 4	1 3 4	22 0 4
i " in the River Dee	89 7 6	20 0 0	100 0 0	247 9 5	8 11 9	465 8 8
	£ 317 7 6	135 0 0	382 6 8	3,842 15 0	134 11 11	4,812 1 1
Tuskar beacon—Expenses of survey for proposed repair	-	-	-	-	-	7 0 0
Crow Rock—Expenses of survey after damage to the beacon	-	-	-	-	-	5 1 0
Mixon, off Chichester—Balance of contract for building beacon thereon, and sundry expenses for Clerk of the Works	-	-	-	-	-	246 3 4
Mixon, Bristol Channel—Cost of a bell-buoy and fittings	-	-	-	-	-	187 5 0
Tower at Walton-on-the-Naze—Sundry small repairs	-	-	-	-	-	5 0 2
Proportion of general stores, paints, spare fittings, &c., supplied to the Buoy Wharf at Blackwall for the service of this Department						419 16 10
						£ 5,682 10 5

REMARKS.

- a Coquet Buoys.—No revenue; maintenance chargeable on the tolls collected for the Coquet lighthouse.
- b Harwich Buoys.—No revenue; maintenance chargeable on the tolls collected for the Sunk light vessel.
- c Heligoland Buoys.—No revenue; maintenance chargeable on the tolls collected for the Heligoland lighthouse.
- d Ramsgate Buoys.—No revenue; maintenance chargeable on the tolls collected for the Goodwin lighthouse.
- e Loos Stream Buoys.—No revenue; maintenance chargeable on the tolls collected for the Owers lighthouse.
- f Plymouth Buoys.—No revenue; maintenance chargeable on the tolls collected for the Edgstone lighthouse.
- g Bidford Buoys.—No revenue.
- h Usk Buoys.—No revenue.
- i Bristol Channel Buoys.—No revenue; maintenance chargeable on the tolls collected for the Bristol Channel floating light.
- k St. George's Channel Buoys.—No revenue.
- l Dee Buoys.—No revenue; maintenance chargeable on the tolls collected for the Air lighthouse.

DETAILED ACCOUNT OF EXPENDITURE IN STEAM AND SAILING VESSELS and TENDERS, DISTRICT STOREHOUSES, and SUPERINTENDENTS, in the year ending 31st December 1857.

Statement D.

STEAM VESSELS.	Wages.		Victualling.		Coals.		Pilotage and Boat Hire.		Disbursements for the Apprentices.		Repairs and Supplies.		Incidentals.	TOTAL.					
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.							
c "Irene," at London	1,718	5 2	-	-	-	-	14	5 0	61	18 2	966	18 2	4,075	0 11	35	4 2	6,874	17 0	
b "Argus," wood do.	-	-	-	-	-	-	-	-	-	-	437	9 4	1,119	11 7	-	-	1,548	0 11	
"Argus" (new iron vessel) at London	1,427	10 11	-	-	-	-	21	13 0	57	11 4	27	10 6	-	-	30	4 4	1,564	10 1	
Supplies for vessels in London district	3,145	16 1	-	-	-	-	-	35	18 0	119	9 6	1,431	3 5	5,186	12 6	65	8 6	9,984	8 0
c "Beacon," at Yarmouth	1,167	5 8	2,013	10 5	2,646	10 6	-	-	-	-	-	-	-	-	-	-	-	4,660	0 11
d "Vestal," at Milford	1,536	16 10	1,013	4 2	1,073	1 4	74	14 6	19	10 9	220	7 7	1,781	11 3	19	2 8	3,575	19 4	
e "Lyra," tender, at Ramsgate	-	-	-	-	4	8 0	-	-	-	-	-	-	-	-	-	-	-	396	2 9
e "Bishop," works at Scilly	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	16	13 0
SAILING VESSELS AND TENDERS.																			
"Sunk," tender, at Harwich	61	13 6	0	11 6	2	6 0	3	6 0	-	-	78	6 10	-	-	18	6 11	164	10 9	
f "Tortoise," barge, at London	25	13 8	80	16 10	-	-	-	-	-	-	10	15 5	-	-	-	-	230	11 0	
"Lyra," tender, at Ramsgate	92	1 0	-	-	6	9 2	3	10 0	12	19 7	132	11 7	-	-	-	-	3	4 0	
g "Buoy Yacht," tender, at Cowes, and afterwards to New "Smalls" Light-house (building)	28	16 9	-	-	-	-	-	-	8	7 3	88	14 2	-	-	0	2 0	126	0 2	
"Diligent," tender, at Plymouth	420	17 6	-	-	3	14 6	1	10 0	6	9 10	93	11 2	-	-	0	3 8	526	6 8	
"Satellite," tender, at Milford	210	12 6	-	-	5	4 1	15	2 6	-	-	44	0 6	-	-	0	8 0	275	8 1	
h "Billow," tender, at Cowes	69	5 3	-	-	2	9 0	16	10 0	10	12 8	48	7 9	-	-	386	13 8	6	15 4	
Scilly tender, at Scilly	60	7 6	-	-	-	-	-	-	-	-	32	12 1	-	-	-	-	92	19 7	
	£	6,829	9 3	3,128	1 11	4,192	1 0	154	14 6	192	9 9	2,827	6 6	8,250	10 7	151	12 3	26,000	14 10

Proportion of paints, oils, and miscellaneous stores supplied to the Buoy Wharf at Blackwall for the use of this branch of the service - £ 1,145 5 1
 Charges in completion of the first cost, and outfit of the new iron steam vessel "Argus" - " 9,309 13 9
 £ 26,291 13 8

DISTRICT STOREHOUSES AND SUPERINTENDENTS.	Superintendents, Salaries and Expenses.	Wages and Allowances.	Coals.	Rents.	Repairs.	Insurances.	Incidentals.	TOTAL.									
£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.								
f London	543	12 0	500	12 8	22	7 4	125	12 10	120	13 3	32	13 0	52	3 4	2,507	16 5	
Yarmouth	364	14 3	81	17 6	3	8 6	36	11 0	69	11 6	-	-	4	4 1	560	6 10	
Ramsgate	201	9 6	-	-	-	-	104	0 0	1	7 5	-	-	26	8 4	333	5 3	
Isle of Wight	126	12 9	-	-	4	16 0	-	-	36	8 9	-	-	23	3 10	191	1 4	
Plymouth	174	5 9	-	-	-	-	20	0 0	0	2 6	-	-	5	12 2	200	0 5	
Milford	350	12 2	169	4 0	3	14 0	65	6 0	74	4 3	-	-	12	0 2	675	0 7	
Isle of Man	-	-	-	-	-	-	9	0 0	1	9 11	-	-	-	-	19	9 11	
Scilly	88	16 2	-	-	-	-	-	-	-	-	-	-	-	-	88	16 2	
	£	1,850	2 7	1,151	14 2	34	5 10	360	9 10	1,103	17 7	32	13 0	123	13 11	4,686	16 11

Purchase money of ground for extension of premises at Great Yarmouth - £ 503 12 4
 Proportion of paints, oils, oil tins, and miscellaneous stores supplied to the Buoy Wharf at Blackwall for use of this branch of the service - " 216 10 11
 Charges, in relation to the purchase of land for erection of storehouse at Wear Point in the Bristol Channel - " 731 12 1
 Total - £ 42,633 5 11

DETAILED ACCOUNT OF EXPENDITURE in respect of LIGHTHOUSES, &c., by the Corporation of Trinity House, London, in the year ending 31st December 1858.

Lighthouses; cost of maintenance and repairs, as per Statement A.	-	-	-	-	-	-	-	£	s. d.
Floating lights; do.	-	-	-	-	-	-	-	25,115	3 3
Buoys and beacons; do.	-	-	-	-	-	-	-	38,235	16 8
Steam and sailing vessels, district superintendents, storerooms, &c., as per Statement D.	-	-	-	-	-	-	-	7,335	10 4
Office and house expenses; repairs, &c. to the house and offices on Tower Hill, wages to gate-keeper, watchmen, and domestic servants, stationery, advertisements, postages, &c.	-	-	-	-	-	-	-	23,998	4 3
E. Salaries of establishment; to the Elder Brethren, and to the secretary and clerks in the establishment on Tower Hill, to the civil engineer, clerk of works, surveyor of shipping, &c.	-	-	-	-	-	-	-	3,167	17 5
F. Miscellaneous expenses; law charges, sundry annuities on private lights, &c., expenses of committees of inspection, and travelling charges generally	-	-	-	-	-	-	-	14,774	11 4
Expenses of collection; commission to those collectors at ports in England, whose appointments were made previously to April 1854, and to those at Cowes, Deal, and Falmouth, and incidental expenses at Runcorn and Gibraltar (those at other ports being paid through the Board of Trade)	-	-	-	-	-	-	-	6,486	12 9
G. Superannuation allowances to retired officers of the official establishment and lighthouse, &c. service, &c., generally	-	-	-	-	-	-	-	2,171	14 8
Charities and pensions; allowances to pensioners on the corporation's charitable funds, granted previously to 1st October 1853; paid for the first quarter only, the pensions being paid by the War Department from the 1st April 1853	-	-	-	-	-	-	-	7,438	9 6
New Works; advances and payments on account of works in progress at the Bishop, Needles, and Smalls Rocks, at Godrevy Island, and at High Whitty	-	-	-	-	-	-	-	4,627	17 3
								£172,285	0 6

(E. E.)

Trinity House, London, E. C., 4th February, 1860.

P. H. BERTON, Secretary.

Statement A.

LIGHTS.	Wages and Allowances.		Rents.	Coals and Fuel.	Carriage of Oil and Stores.	Boat Hire and Assistance.	Repairs.		Incidentals.	TOTAL.
	£ s. d.	£ s. d.					Ordinary.	Special.		
a Fern	310 16 9	-	39 19 10	1 7 10	32 9 6	75 14 10	-	-	15 18 3	475 11 0
Coquet	110 0 0	24 7 6	30 4 0	0 19 0	-	36 7 5	-	-	2 10 7	213 8 6
Timbra	125 0 0	-	15 16 6	1 19 4	-	25 8 1	-	-	0 19 6	159 6 8
Flambro	59 17 6	-	19 4 0	4 15 11	5 14 8	40 14 0	9 16 0	-	0 17 1	180 19 2
b Spurn	150 15 0	104 19 0	31 4 0	6 17 4	-	197 3 0	341 15 7	-	8 8 8	841 2 7
Hunstanton	110 0 0	-	12 4 0	1 10 0	-	50 11 0	-	-	4 0 8	156 18 5
Cromer	140 0 0	-	15 4 0	1 17 6	3 6 0	8 16 7	-	-	10 13 4	166 17 5
c Haisora	270 0 0	0 15 0	63 8 0	15 3 4	-	183 18 2	52 4 6	-	1 4 11	626 13 5
Winterton	140 0 0	-	22 6 0	1 13 6	2 2 0	32 15 5	-	-	0 16 8	159 13 7
d Lowestoft	175 0 0	-	21 14 0	1 11 0	-	55 7 4	-	-	0 15 8	234 8 0
e Pakefield	110 0 0	0 17 3	16 8 6	1 2 2	-	51 15 2	25 0 10	-	5 6 11	210 10 8
f Orford	221 10 0	-	37 17 0	1 11 0	7 16 6	44 19 3	-	-	0 6 2	313 19 11
g Harwich	137 2 0	-	23 14 0	-	-	34 13 0	-	-	0 4 7	215 19 5
h Langard Fort	52 0 0	2 0 0	3 18 11	-	-	14 5 7	-	-	-	72 4 6
Mucking	52 2 6	3 0 0	-	-	-	33 14 4	-	-	1 0 0	129 16 10
i North Foreland	110 0 0	1 2 11	27 15 0	2 0 0	-	17 17 0	1,074 8 6	-	0 3 0	1,233 8 5
South Foreland	20 0 0	5 4 0	67 10 0	6 15 11	-	240 13 1	-	-	0 16 0	520 19 0
Dungeness	110 0 0	-	25 17 0	0 3 0	-	79 13 3	-	-	0 12 8	205 5 11
Beacon Head	150 0 0	0 5 0	33 12 0	9 8 0	-	59 2 1	-	-	11 18 3	304 5 4
l St. Catherine's	110 0 0	-	18 13 0	3 7 8	-	52 1 8	-	-	0 4 3	186 6 1
Needles	110 0 0	-	29 19 3	2 9 1	-	11 14 4	-	-	1 12 9	155 5 5
m Hurst	155 0 0	-	31 10 0	0 6 6	-	38 13 4	-	-	0 3 11	225 8 4
n Portland	229 0 0	-	27 15 0	15 1 8	-	214 17 10	104 15 11	-	0 10 1	588 0 6
Start	110 0 0	-	20 5 0	1 5 0	-	13 16 11	-	-	0 6 1	145 13 0
o Palmouth Harbour	110 7 6	0 5 0	14 13 4	-	-	11 3 8	-	-	0 3 8	139 13 2
p Lizard	185 0 0	0 10 9	23 4 0	11 7 6	-	35 14 0	-	-	0 4 4	256 1 5
Seilly	111 15 0	19 10 0	12 12 0	5 9 3	-	34 10 0	-	-	1 9 0	185 6 1
q Trevose Head	110 0 0	-	19 17 0	5 9 10	-	173 6 0	-	-	11 1 3	399 4 1
r Lundy	111 10 0	-	18 15 0	9 4 0	23 0 0	23 2 3	257 1 6	-	1 1 8	458 14 5
s Bideford	110 0 0	9 0 0	16 0 7	0 8 6	-	35 3 10	27 6 2	-	0 6 3 10	204 2 11
t Burnham	175 0 0	0 3 2	15 19 0	1 9 6	-	10 16 7	-	-	1 15 1	293 3 4
U Avon	110 0 0	2 2 0	11 18 0	-	-	30 19 5	-	-	0 8 0	155 7 11
v U.K.	110 0 0	0 12 0	2 7 6	1 13 2	-	83 13 0	-	-	0 12 6	208 18 2
w Flatholm	110 0 0	-	13 17 0	2 9 10	2 0 0	17 11 5	-	-	0 9 2	146 8 3
x Nash	155 0 0	0 15 3	25 7 7	7 8 6	-	12 18 7	-	-	1 19 1	293 9 0
y Milford	155 0 0	-	22 0 0	2 6 6	20 0 0	74 5 6	-	-	0 17 8	370 9 8
z Bardsley	114 0 0	-	19 6 3	0 12 6	5 16 0	71 1 0	-	-	0 13 0	211 8 9
aa South Stack	110 0 0	5 1 0	20 18 0	1 9 9	7 14 6	11 15 1	400 0 0	-	0 12 1	552 10 3
Skerries	127 10 0	-	20 16 0	1 2 1	51 17 0	12 2 11	-	-	1 7 9	214 15 9
Menai	110 0 0	-	24 11 6	0 2 0	-	18 18 1	-	-	0 8 8	154 1 1
aa Air	111 10 0	-	20 13 7	5 10 6	-	15 1 9	78 0 6	-	0 12 2	235 15 6
bb St. Bees	110 0 0	0 1 5	16 6 0	3 3 6	-	15 7 9	-	-	1 17 8	145 4 4
Gunfleet	238 12 6	-	3 18 11	-	-	7 18 3	345 17 5	2 0 6	-	599 7 7
Chapman	238 2 6	-	-	-	-	18 5 3	42 0 0	-	-	298 7 9
c Caskets	396 6 6	5 0 0	11 11 4	2 6 7	104 15 6	341 17 5	-	-	16 12 4	838 9 8
y Plymouth Breakwater	169 6 2	-	5 15 6	-	-	14 9 5	-	-	-	210 11 1
Edystone	312 8 6	-	7 13 0	1 12 8	-	13 14 11	-	-	0 7 0	411 6 3
Longships	291 10 0	-	24 1 0	2 3 0	62 13 6	290 3 6	27 6 0	-	2 15 0	610 11 0
Bishop Rock	106 2 0	-	7 6 0	0 9 0	3 18 0	-	-	-	0 2 0	337 17 10
Small's	315 0 0	5 0 0	7 13 0	2 10 0	-	7 19 10	-	-	0 2 0	411 6 3
z South Bishop	211 2 0	-	8 4 6	1 16 11	-	3 0 0	159 8 0	-	0 8 6	472 19 11
Heligoland	155 0 0	-	25 10 0	39 2 6	-	8 1 9	-	-	2 5 9	290 0 0
Gibraltar	165 13 4	-	-	9 17 8	-	49 0 5	-	-	10 19 10	236 11 3
Whitby	55 0 0	-	-	4 18 6	-	-	-	-	0 1 7	60 0 1
Supernumerary Lightkeepers	275 15 10	-	-	-	-	-	-	-	-	275 15 10
	£ 9,126 1 1	190 11 3	1,668 11 11	210 17 0	335 5 2	3,176 9 10	3,864 0 11	116 7 1	17,319 1 3	

Proportion of general stores, oil, wicks, &c. supplied to the Buoy Wharf Blackwall for use of this branch of the service

7,729 3 9

Sums paid for Colonial Lights and for Holyhead Harbour Light to be re-imbursed to the Trinity House

25,071 5 0

43 19 3

£ 25,115 3 3

REMARKS.

- a Fern.—Three lighthouses.
 - b Spurn.—Two lighthouses; 34d. 15s. 7d. is for special repairs to sea defences.
 - c Haisora.—Two lighthouses.
 - d Lowestoft.—Two lighthouses.
 - e Pakefield.—No revenue; maintenance chargeable on the tolls collected for Lowestoft.
 - f Orford.—Two lighthouses. No revenue; maintenance chargeable on the tolls collected for Winterton.
 - g Harwich.—Two lighthouses.
 - h Langard Fort.—Light exhibited from a window in the curtain bastion of the fort. No revenue; maintenance chargeable on the tolls collected for Harwich.
 - i North Foreland.—£1,074. 8s. 6d. includes part cost of a new lantern and fitting.
 - k South Foreland.—Two lighthouses.
 - l St. Catherine's and Hurst Light's.—No revenue; maintenance chargeable on the tolls collected for the Needles.
 - m Hurst.—Two lighthouses.
 - n Portland.—Two ditto. The sum of 104d. 15s. 11d. is in completion of cost of new dwellings for the keepers.
 - o Lizard.—Two lighthouses.
 - p Trevose Head.—Two light towers.
 - q Lundy.—The sum of 57d. 1s. 6d. is for part cost of a new catadioptric revolving apparatus of the first order.
 - r Bideford.—Two lighthouses; one moveable; they are both built of wood, the sum of 9d. entered under the head of "Rents," &c. is for insurance.
 - s Burnham.—Two lighthouses.
 - t Avon light.—No revenue; maintenance chargeable on the tolls collected for the Bristol Channel Floating Light.
 - u Nash.—Two lighthouses.
 - v Milford or St. Ann's Point.—Two lighthouses.
 - w South Stack.—The sum of 400s. is part of the contract price for erection of keeper's dwellings, &c. thereat.
 - x Caskets.—Three light towers.
 - y Plymouth Breakwater Light.—No revenue; maintenance chargeable on the tolls collected for the Eddystone.
 - z South Bishop.—The sum of 198s. 8s. is for removing the lighting apparatus, and substituting the lenses from Lundy in lieu thereof.
- The periodical painting of those establishments in rotation for this year is included in the ordinary repairs.
The under-mentioned stations are outlying or rock stations, at which the keepers have an allowance of one shilling and sixpence per day per man for victualling, in addition to their wages.
- | | | | |
|----------|------------|------------|---------------|
| Maplin. | Caskets. | Longships. | South Bishop. |
| Chapman. | Eddystone. | Small's. | Gunfleet. |

XI. CONSTITUTION OF GENERAL AUTHORITY, &c. XI.
DETAILED ACCOUNT OF EXPENDITURE ON LIGHTVESSELS, in the Year ending 31st December 1858.
Statement B.

LIGHTS.	Wages and Allowances.	Rents.	Coals and Fuel.	Carrriage of Oil and Stores.	Repairs.		Incidentals.	TOTAL.
					Ordinary.	Special.		
Spinn	£ s. d. 733 15 10	£ s. d. - - -	£ s. d. 7 17 9	£ s. d. - - -	£ s. d. 37 17 11	£ s. d. - - -	£ s. d. - - -	£ s. d. 779 11 6
Dudgdon	728 15 0	- - -	8 1 3	0 8 0	60 7 9	- - -	0 16 7	798 8 7
Lyon Well	739 5 0	- - -	8 14 3	- - -	27 4 4	- - -	2 13 1	774 16 8
Leman and Ower	772 11 2	- - -	8 1 3	- - -	92 0 1	- - -	2 11 0	873 3 6
Hatbro'	730 5 0	- - -	7 17 9	- - -	65 8 7	- - -	4 17 5	808 8 9
Cockle	740 0 7	- - -	7 14 3	- - -	27 15 1	- - -	- - -	775 11 2
a Newarp	726 8 10	- - -	7 14 3	1 0 4	445 11 10	380 17 3	5 4 9	1,566 17 3
St. Nicholas Gatt	743 6 6	- - -	7 14 3	0 2 8	71 12 5	423 12 4	1 4 5	1,247 12 7
Stanford	728 15 0	- - -	7 14 3	0 2 6	57 13 1	- - -	0 14 0	764 18 10
Shipwash	733 18 6	- - -	7 18 0	- - -	42 9 5	- - -	1 16 4	785 12 3
c Cork	732 8 6	- - -	7 18 0	- - -	68 15 0	- - -	1 10 8	810 12 2
Galloper	744 9 9	- - -	- - -	- - -	33 18 2	- - -	- - -	777 8 8
Kentish Knock	730 2 4	- - -	- - -	- - -	28 5 7	- - -	1 0 0	759 7 11
Sunk	725 3 5	- - -	7 18 0	- - -	109 18 1	- - -	1 0 4	835 19 10
Prince's Channel	739 10 7	- - -	- - -	- - -	37 13 2	- - -	0 2 6	780 17 2
Swin Middle	732 16 2	- - -	- - -	- - -	41 17 10	655 15 0	- - -	1,430 9 0
Mouse	744 4 10	- - -	- - -	- - -	23 2 8	- - -	- - -	767 7 6
Nore	739 10 7	- - -	- - -	- - -	37 13 4	474 12 9	- - -	1,211 16 8
Gurder	750 3 10	- - -	- - -	- - -	47 2 10	- - -	- - -	797 8 8
Tongue	711 14 9	- - -	- - -	- - -	29 11 2	- - -	- - -	771 5 11
Goodwin	734 13 6	- - -	13 15 0	- - -	72 14 1	- - -	1 0 0	822 2 7
d Gull	745 17 5	- - -	12 12 1	1 10 0	49 3 8	- - -	1 10 0	801 15 2
South Sand Head	739 19 0	- - -	11 9 2	3 0 0	17 0 4	- - -	2 11 8	761 0 2
Owers	725 9 0	- - -	12 18 0	0 4 5	32 0 11	- - -	2 5 0	772 14 7
e Bembridge	735 0 0	- - -	13 14 6	0 1 2	66 0 9	- - -	3 0 8	817 17 1
g Warner	729 5 6	- - -	13 4 6	0 3 0	25 10 10	- - -	2 12 2	770 16 0
Calshot	727 18 6	- - -	11 10 0	0 5 2	15 8 6	- - -	4 14 8	759 16 10
Seven Stones	1,129 19 3	4 13 0	22 8 0	0 2 0	68 16 4	618 16 9	12 13 2	1,889 6 6
English and Welsh Grounds	728 17 0	- - -	8 1 1	0 9 0	50 4 8	- - -	1 0 2	788 11 11
Helwicks	731 14 4	- - -	9 17 9	0 4 11	32 3 1	- - -	1 7 5	775 7 6
f Bahama Bank	734 1 7	- - -	7 19 0	53 11 2	444 11 4	- - -	10 19 6	1,229 2 7
Spare or substitute Vessels at—	- - -	- - -	- - -	- - -	- - -	- - -	- - -	- - -
Yarmouth	- - -	- - -	3 15 4	- - -	15 17 8	- - -	1 15 4	21 8 4
London	- - -	- - -	- - -	- - -	36 4 5	- - -	- - -	36 4 5
Milford	56 14 3	- - -	4 16 2	0 3 0	18 9 0	43 5 3	0 8 0	124 5 8
A Godrevy	570 9 6	- - -	8 3 4	1 4 8	9 18 8	881 14 8	17 11 2	1,469 2 0
	£ 23,902 8 11	4 13 0	248 7 2	63 10 0	2,335 15 0	3,478 14 0	87 11 3	30,120 19 4
Proportion of general stores, oil, wicks, paints, spare globes, and moorings supplied to the Buoy Wharf at Blackwall, for the service of this department								8,114 17 4
								£ 38,235 16 8

REMARKS.

- a Newarp.—No revenue; maintenance chargeable on the tolls collected for the Habaro's Lighthouses. The item for ordinary repairs is unusually large, a sum for repair of damage being included, part of which was reimbursed to the Corporation.
 - Stanford.—No revenue; maintenance chargeable on the tolls collected for the Lowestoft Lighthouses.
 - e Bembridge.—No revenue; maintenance chargeable on the tolls collected for the Sunk lightvessel.
 - d Gull.—No revenue; maintenance chargeable on the tolls collected for the Goodwin lightvessel.
 - e Bembridge.—No revenue; formerly maintained by the Admiralty; transferred to the Trinity House under 6 & 7 Will. IV. cap. 79.
 - f Bahama Bank.—The sum for ordinary repairs is larger than usual, owing to a portion of the moorings having been renewed.
 - g Warner.—No revenue; 50*l.* per annum paid by the Admiralty for maintenance of the vessel, the wages, &c. of the crew and maintenance of the light being borne by the "Mercantile Marine Fund."
 - A Godrevy.—First exhibited, 21st March 1858.
- Each crew consists of 17 men, except that at the "Seven Stones," which consists of 17 men.

DETAILED ACCOUNT OF EXPENDITURE ON BOYS AND BEACONS, in the year ending 31st December 1858.

Statement C.

STATION OR DISTRICT.	Salary to Buoy Keeper.	Rents, &c.	Boat Hire and Assistance.	Repairs to Boys and Fittings, New Boys, &c.	Incidentals.	TOTAL.
a Boys off Coquet Island	£ s. d. 35 0 0	£ s. d. - - -	£ s. d. 7 19 6	£ s. d. 37 15 9	£ s. d. 5 5 0	£ s. d. 86 0 3
" in the River Tees	100 0 0	- - -	185 9 10	175 15 5	9 19 2	471 4 5
" off Yarmouth	- - -	- - -	4 0 0	1,426 3 0	42 12 11	1,469 5 11
" and beacons in Woodbridge Haven	10 0 0	- - -	6 0 0	13 18 0	7 5 5	37 7 5
b " off Harwich	- - -	- - -	- - -	336 0 5	23 0 8	359 1 1
" and beacons in the Channels leading to the River Thames, and Port of London	- - -	- - -	- - -	876 10 7	13 7 2	897 17 9
Reculvers Church Towers	20 0 0	- - -	- - -	24 3 3	0 0 6	44 3 9
c Boys and beacons at Heligoland	- - -	- - -	4 12 0	24 7 0	- - -	28 19 0
d " Ramsgate	- - -	- - -	14 10 0	334 0 8	4 4 0	352 4 8
e " in the Loos stream	- - -	- - -	- - -	11 8 5	- - -	11 8 5
f " off Plymouth	- - -	- - -	0 10 0	39 12 5	5 19 0	46 1 5
g " at Exmouth	25 0 0	0 10 0	- - -	5 1 9	3 13 0	36 3 3
h " at Budeford	10 0 0	7 0 0	18 15 0	69 19 0	0 8 9	106 2 9
i " in the Usk	- - -	- - -	- - -	24 11 2	- - -	24 11 2
" and beacons in the Bristol Channel	- - -	75 6 2	1 13 0	760 15 6	3 6 4	861 1 0
k " in St. George's Channel	- - -	0 2 6	6 4 9	195 7 8	8 3 0	209 17 0
" in the River Conway	12 0 0	0 0 0	18 15 8	80 11 8	0 14 8	117 2 3
" at Carmarthen	20 0 0	8 18 0	29 12 6	44 0 7	2 9 9	104 13 15
" at Aberdovey	- - -	2 0 0	6 17 6	4 16 2	0 13 3	20 6 11
l " in the River Dee	89 7 6	20 0 0	100 0 0	334 15 11	12 12 10	556 16 3
	£ 327 7 6	119 16 8	403 11 1	4,839 4 7	143 12 5	5,833 12 3
Charges on account of the fox gun at South Stack	- - -	- - -	- - -	- - -	- - -	140 14 9
Tasker beacon, in course of reconstruction	- - -	- - -	- - -	- - -	- - -	395 4 8
Rundstone beacon, expenses of inspection	- - -	- - -	- - -	- - -	- - -	1 3 4
Stones Rocks, St. Ives Bay, repairing and relaying the buoy broken adrift from that station	- - -	- - -	- - -	- - -	- - -	24 19 5
Lock beacon, sundry engineering charges	- - -	- - -	- - -	- - -	- - -	1,469 5 11
Nixon beacon, off Christchurch, engineering charges	- - -	- - -	- - -	- - -	- - -	27 0 0
Nelson's monument, at Yarmouth, contribution towards repair of this seamark	- - -	- - -	- - -	- - -	- - -	50 0 0
Proportion of general stores, paints, spare fittings, &c. supplied to the Buoy Wharf Blackwall, for the service of this Department						858 6 11
						£ 7,335 10 4

REMARKS.

- a Coquet Boys.—No revenue; maintenance chargeable on the toll collected for the Coquet light-house.
- b Harwich Boys.—No revenue; maintenance chargeable on the tolls collected for the Sunk lightvessel.
- c Heligoland Boys.—No revenue; maintenance chargeable on the tolls collected for the "Heligoland" light-house.
- d Ramsgate Boys.—No revenue; maintenance chargeable on the tolls collected for the Goodwin lightvessel.
- e Loos Stream Boys.—No revenue; maintenance chargeable on the tolls collected for the Owers lightvessel.
- f Plymouth Boys.—No revenue; maintenance chargeable on the tolls collected for the Eddystone light-house.
- g Bideford Boys.—No revenue.
- h Usk Boys.—No revenue.
- i Bristol Channel Boys.—No revenue; maintenance chargeable on the tolls collected for the Bristol Channel floating light.
- k St. George's Channel Boys.—No revenue.
- l Dee Boys.—No revenue; maintenance chargeable on the tolls collected for the Air light-house.

Circular I.
Question XI.

DETAILED ACCOUNT OF THE EXPENDITURE ON STEAM AND SAILING VESSELS AND TENDERS, DISTRICT STOREHOUSES, AND SUPERINTENDENTS, in the year ending 31st December 1858.

Statement D.

STEAM VESSELS.	Wages.	Vetualing.	Coals.	Pilottage and Boat Hire.	Disbursements for the Apprentices.	Repairs and Supplies.		Incidentals.	TOTAL.
						Ordinary.	Special.		
"Irene," at London	£ s. d. 1,721 17 8	£ s. d. -	£ s. d. -	£ s. d. 72 16 2	£ s. d. 41 14 7	£ s. d. 805 4 11	£ s. d. -	£ s. d. 52 16 6	£ s. d. 2,694 9 10
"Argus," do	£ s. d. 3,452 19 0	£ s. d. -	£ s. d. -	£ s. d. 16 4 9	£ s. d. 42 6 7	£ s. d. 718 8 2	£ s. d. -	£ s. d. 24 11 8	£ s. d. 4,144 6 4
Supplies for vessels in London District	£ s. d. 3,184 16 8	£ s. d. 1,683 9 1	£ s. d. 2,458 17 3	£ s. d. 89 0 11	£ s. d. 84 1 2	£ s. d. 1,351 13 1	£ s. d. -	£ s. d. 77 7 9	£ s. d. 4,586 19 7
"Beacon," at Yarmouth	£ s. d. 1,134 18 5	£ s. d. 18 6 0	£ s. d. 463 11 5	£ s. d. -	£ s. d. 21 16 8	£ s. d. 276 17 2	£ s. d. 571 16 1	£ s. d. 10 12 7	£ s. d. 2,497 18 4
"Vestal," at Milford	£ s. d. 1,871 3 1	£ s. d. 696 5 5	£ s. d. 829 9 7	£ s. d. 55 12 0	£ s. d. 18 10 9	£ s. d. 538 3 9	£ s. d. -	£ s. d. 49 1 10	£ s. d. 3,798 6 5
"Bishop," works at Scilly. On service at Bishop Rock light, (building)									
SAILING VESSELS AND TENDERS.									
"Sunk," tender, at Harwich	£ s. d. 61 13 6	£ s. d. -	£ s. d. 1 19 5	£ s. d. 3 3 0	£ s. d. -	£ s. d. 127 9 9	£ s. d. 232 7 4	£ s. d. 0 19 10	£ s. d. 447 12 10
"Lyra," tender, at Ramsgate	£ s. d. 91 8 0	£ s. d. -	£ s. d. 7 8 10	£ s. d. 5 0 0	£ s. d. 11 15 1	£ s. d. 52 1 7	£ s. d. -	£ s. d. -	£ s. d. 207 13 9
"Diligent," tender, at Plymouth	£ s. d. 420 18 0	£ s. d. -	£ s. d. 4 1 6	£ s. d. 13 5 0	£ s. d. 2 10	£ s. d. 16 19 8	£ s. d. 97 19 5	£ s. d. -	£ s. d. 531 3 11
"Saxifrage," tender, at Milford	£ s. d. 197 1 6	£ s. d. -	£ s. d. 3 1 6	£ s. d. 15 0 0	£ s. d. -	£ s. d. 104 5 3	£ s. d. -	£ s. d. 1 4 0	£ s. d. 319 7 3
"Billow," tender, at Cowes	£ s. d. 91 13 3	£ s. d. -	£ s. d. 3 14 9	£ s. d. -	£ s. d. 14 6 0	£ s. d. 62 8 8	£ s. d. -	£ s. d. 1 2 0	£ s. d. 173 4 8
"Scilly," tender, at Scilly	£ s. d. 61 19 0	£ s. d. -	£ s. d. 3 14 8	£ s. d. 3 0 0	£ s. d. -	£ s. d. 9 1 5	£ s. d. 125 9 2	£ s. d. -	£ s. d. 203 4 3
	£ 6,815 11 5	£ 2,400 0 6	£ 3,775 18 11	£ 171 0 11	£ 159 9 12	£ 2,779 0 4	£ 1,647 12 0	£ 141 0 6	£ 17,289 17 4
Proportion of paints, oils, and miscellaneous stores supplied to the Buoy Wharf at Blackwall, for use of this branch of the service									£ 1,835 13 1

DISTRICT STOREHOUSES AND SUPERINTENDENTS.	Superintendents, Salary and Expenses.	Wages and Vetualing.	Coals.	Rents.	Repairs.	Insurances.	Incidentals.	TOTAL.	
London	£ s. d. 528 5 2	£ s. d. 517 13 10	£ s. d. 22 16 9	£ s. d. 121 15 3	£ s. d. 889 3 10	£ s. d. 16 6 6	£ s. d. 44 2 6	£ s. d. 2,549 3 10	
Yarmouth	£ s. d. 352 8 4	£ s. d. 61 8 6	£ s. d. 2 10 3	£ s. d. 34 19 0	£ s. d. 58 3 3	£ s. d. -	£ s. d. 33 13 9	£ s. d. 560 8 2	
Ramsgate	£ s. d. 187 14 7	£ s. d. -	£ s. d. 6 18 0	£ s. d. 104 0 0	£ s. d. 6 17 3	£ s. d. -	£ s. d. 27 7 0	£ s. d. 325 13 10	
Ile of Wight	£ s. d. 144 14 2	£ s. d. -	£ s. d. -	£ s. d. 0 4 10	£ s. d. 13 16 8	£ s. d. -	£ s. d. 19 1 11	£ s. d. 184 15 7	
Plymouth	£ s. d. 172 2 3	£ s. d. -	£ s. d. -	£ s. d. 20 0 0	£ s. d. -	£ s. d. -	£ s. d. 5 9 4	£ s. d. 197 11 7	
Milford	£ s. d. 371 9 11	£ s. d. 169 11 0	£ s. d. 2 5 7	£ s. d. 65 1 3	£ s. d. 16 10 0	£ s. d. -	£ s. d. -	£ s. d. 634 6 9	
Ile of Man	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. 9 0 0	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. 9 0 0	
Harwich	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. 2 0 0	£ s. d. 14 11 0	£ s. d. -	£ s. d. 24 0 2	£ s. d. 40 11 2	
Scilly	£ s. d. 126 16 2	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. -	£ s. d. 126 16 2	
	£ 1,883 10 7	£ 1,148 13 4	£ 34 10 7	£ 357 0 5	£ 996 2 0	£ 16 6 6	£ 180 3 5	£ 4,616 6 10	
Proportion of paints, oils, tin, and miscellaneous stores supplied to the Buoy Wharf at Blackwall, for use of this branch of the service									£ 566 7 0
									£ 5,172 13 10
									£ 23,998 4 3

RETURN TO REQUISITION dated 15th February 1860.

Statement F.—continued.

DETAILED ACCOUNT OF EXPENDITURE FOR SALARIES OF ESTABLISHMENT in the Year ending 31st December 1857 and 1858.

Statement E.

	1857.	1858.
Salaries to the Elder Brethren	£ 7,000 0 0	£ 7,000 0 0
Salaries to the secretary, assistant-secretary, and clerks in his department.	£ 3,744 12 4	£ 3,679 19 1
Salaries in accountant's department	£ 722 10 0	£ 743 0 0
Salaries in department for examination, &c., of acc. vouch. collection.	£ 680 8 4	£ 727 10 0
Salaries to temporary clerks	£ 91 0 0	£ 164 7 6
Salaries to messengers	£ 396 0 0	£ 364 17 9
Salary to housekeeper	£ 100 0 0	£ 100 0 0
Salary to scientific adviser in experiments on lights.	£ 75 0 0	£ 150 0 0
Salary to civil engineer	£ 75 0 0	£ 125 0 0
Salary to clerk of works	£ 80 0 0	£ 80 0 0
Payments to certain clerks for drawings and plans of light establishments.	£ 96 0 0	£ -
	£ 13,135 0 8	£ 14,774 14 4

In 1857 the civil engineer was paid by commission on work done, which was charged to the several lights, &c., establishments upon which he had been engaged. The salary to the superintending working engineer (£300 per annum) is charged in 1857 and 1858 under the head of "New Works" to the Bishop Rock Lighthouse, upon which he was then employed.

DETAILED ACCOUNT OF THE MISCELLANEOUS EXPENSES in the Years ending 31st December 1857 and 1858.

Statement F.

	1857.	1858.
Law charges:	£ s. d.	£ s. d.
Solicitors' professional account for the preceding year.	£ 550 0 10	£ 239 13 4
Further taxed costs in relation to the purchase money per the Skerries light.	£ 272 12 3	£ 2,329 17 0
Conveyance of land at Solva for the works for building a new lighthouse on the Smalls Rock.	£ 14 0 6	£ -
Conveyance of land at Great Yarmouth for the use of the buoy department and storehouse thereat.	£ 29 8 10	£ -

	1857.	1858.
Conveyance of land at Hazlebeach in the Bristol Channel for proposed storehouse thereat.	£ -	£ 57 13 2
Annuitants on lights transferred or purchased under the Act 6 & 7 Will. IV. c. 79.:		
Smalls Light, E. Swettenham	£ 100 0 0	£ 144 7 8
Do, S. Levy	£ 100 0 0	£ 100 0 0
Do, A. Woodward	£ -	£ 200 0 0
Do, E. Bowen	£ 20 0 0	£ 20 0 0
Do, M. Clay	£ 6 0 0	£ 6 0 0
Do, T. Goughly	£ 100 0 0	£ 100 0 0
Spurn Point Lights, Trinity House, Hull	£ 40 0 0	£ 40 0 0
Do, Trinity House, Newcastle.	£ 32 0 0	£ 32 0 0
Compensations under Act 6 & 7 Will. IV. c. 79.:		
N. Armstrong, as collector of Timnouth, Spurn, and Skerries light duties at Newcastle.	£ 230 10 8	£ 230 10 8
T. Blythe, as collector of Skerries light duties at Liverpool.	£ 753 6 8	£ 753 6 8
M. Brewer, as collector of Skerries light duties at Newport.	£ 6 4 6	£ 9 6 9
C. Brough, as clerk to collector of Timnouth and Spurn light dues at Newcastle.	£ 33 6 8	£ 33 6 8
T. W. Budd, as receiver of Spurn light duties.	£ 33 6 8	£ 33 6 8
J. Greene, as collector of Skerries light duties at Belfast.	£ 44 2 10	£ 44 2 10
T. Rosdick, as sub-collector of duties at Pembrey.	£ 4 15 11	£ 9 11 10
C. Sheriff, as clerk to collector of lights at Sunderland.	£ 12 15 0	£ 12 15 0
J. Simpson, as collector of Timnouth and Spurn light duties at Sunderland.	£ 324 0 10	£ 319 0 10
S. H. Stecker, as collector of light duties at Bristol.	£ 4 8 6	£ 3 13 9
T. Thompson, as collector of light duties at Berwick.	£ 10 16 10	£ 10 16 10
W. Whitely, as collector of Skerries light duties at Cork.	£ 43 11 8	£ 43 11 8
J. Walsh, as collector of Dungeness light duties at the Port of London.	£ 28 3 10	£ Dead.
Annuitant to the Rev. W. J. Coope, of Fal-mouth, chargeable on the revenue of the Black Rock beacon.	£ 20 0 0	£ 20 0 0
Committees of inspection to various stations	£ 610 18 1	£ 821 11 7
Travelling charges of lightkeepers and others	£ 150 3 11	£ 243 8 2
Charges for experiments and for the trial of oil.	£ 194 0 6	£ 53 8 9
Civil engineer, for expenses not chargeable to any particular light.	£ -	£ 116 11 0
Incidental expenses	£ 238 16 10	£ 316 47 5
	£ 4,018 12 4	£ 6,486 12 9

ENGLAND.
Circular I.
Question
XII.

XII, XIII.

XII. MODE OF AUDIT.

The finances of the Trinity House are administered by the Court itself, details being delegated to committees for the department to which they belong, and each item of receipt and expenditure examined by the Board at an audit held four times a year.

The cash book is balanced monthly, and checked by the rental warden, who takes care that each item of revenue advised is accounted for, and that every disbursement is properly vouched. The rental warden examines the state of cash every week, and reports the same to the wardens in committee.

At an audit of accounts held quarterly, the Deputy Master reads each item from the cash book to the Elder Brethren, who have the books of detail and check distributed amongst them, and who read in reply from their respective books each item so called, before the Deputy Master proceeds to the next.

The principle of payment is, that no sum, however small, shall be disbursed without an order of the Court or a voucher bearing the written authority of an Elder Brother for the payment, such Elder Brother either being the chairman or acting for the Chairman of the Committee under whose sanction the expenses were incurred.

The modes of payment are,—

1. By cheque on the Bank of England.
2. By cashier at the Trinity House.
3. By district or local agent at the outports.

Cheques on the Bank of England are signed first by the rental warden, who examines the vouchers and requires that every voucher shall be signed by the Chairman of a Committee, and countersigned by the accountant, except in copies of orders of Court, which are signed by the secretary. The cheque is afterwards signed by another warden, and, when issued, is signed by the secretary or assistant secretary. Each cheque must be signed by two wardens, and countersigned by the secretary or assistant secretary.

Cash payments are made only by the secretary or assistant secretary, to whom the rental warden advances from time to time such sums as they require to meet small disbursements. They are governed by the same rule as the rental warden as to vouchers and signatures, and their accounts are made up and balanced at the end of each month, and examined by the rental warden.

Agents at outports pay all local expenses of the light, &c. establishments, such as wages, boat hire, small repairs, superannuations, &c. All expenses incurred and disbursements made by them must first be sanctioned by the Board, either by general order, as wages, rents, superannuations, &c., or by special authority, such as repairs and supplies.

Stores and supplies are procured by contract publicly competed for.

The Board of Trade require all Specifications to be submitted to them before tenders are invited, and also to have such tenders before them previously to their acceptance.

P. H. BERTHON,
Secretary.

Trinity House, London,
7th January, 1860.

XIII.

XIII.

RETURN TO REQUISITION dated 10th June 1859.

1. DETAILED ACCOUNT of the System employed in conducting the Financial Department of the Establishment, showing how and where the Monies received for Lights, Buoys, and Beacons are retained pending the process of final deposit, and also mode adopted for obtaining and disbursing the necessary Monies for the current and ordinary Expenses of the Establishment, and for meeting the Bills due under Building and other Contracts, as well as for the regular Maintenance of Lights, Buoys, and Beacons.

The financial business of the establishment is conducted under the direct personal supervision of the senior or rental warden, who reports every week to the wardens' committee

XIII.

the previous week's receipt, expenditure, and balance in hand. The mode of examination and check is described at length in the paper headed "Mode of Audit."

The account of monies received for lighthouse, &c. revenue is kept distinct from that of monies disbursed for expenses, though both are kept in one account at the Bank of England, the only payments out of revenue monies being those to the paymaster general.

All revenue from lighthouse, &c. tolls is remitted by the collectors at London and outports either direct to the Bank of England to the account of the "Trinity House, London, Public Account," or by draft on a London Banker, which is paid into the bank, to be collected when mature. Each collector remits at stated periods (those at London and Liverpool daily, others weekly, monthly, or quarterly, according to the average collection at the respective ports), and renders an account quarterly in detail, showing the amount collected from each vessel, the total agreeing with the amount remitted. These accounts are examined in detail, each vessel being checked by the Table of Light Duties, and any error, surplus or minus, is referred to the collector for correction.

So soon as a sufficient sum is accumulated at the Bank, the rental warden reports the same to the wardens' committee, and an amount of 10,000*l.* or 12,000*l.* is ordered to be paid over to Her Majesty's paymaster general, a request for authority to do so being first sent to the Board of Trade.

The account of gross revenue is made up quarterly, submitted to the wardens' committee, signed by the deputy master and two wardens, and rendered to the Board of Trade; the balance shown by such account is ordered to be paid in to the paymaster general, as above described.

The revenue is paid in gross, deducting only repayments of duties. The commission on collection is paid and charged as a disbursement.

The necessary monies for the current and ordinary expenses of the establishment, and for meeting the bills due under building and other contracts, as well as for the regular maintenance of lights, buoys, and beacons, are obtained by imprest from the paymaster general, with the authority of the Board of Trade, in sums varying in amount as the need occurs. The imprest is requested by the committee of wardens on the rental warden's report of the state of cash.

The amount of imprest is placed by the paymaster general to the credit of the "Trinity House, London, Public Account," at the Bank of England, and is applied in cash payments to tradesmen in London, and to the establishment expenses, and in remittances to district or local agents and builders, and other large contractors for works at the outports. The mode of disbursement by cheque, &c., and the authority required for each payment, is detailed in the paper headed "Mode of Audit."

Remittances to district superintendents and local agents are made periodically, of regular amounts fixed on by the Board sufficient for the current ordinary expenditure of each district or agency, such as wages, rents, &c. Each agent transmits quarterly an account with receipts and vouchers for the disbursements made, and submits bills incurred in the period for approval, for which, after being submitted to a committee, remittance is made of the amount required for payment.

All repairs, supplies, and requisite disbursements are submitted to and approved by the committee to whose department they relate, before being incurred, and when completed the bills are checked with the orders, signed by the receiver or superintendent and submitted to the committee before payment.

The detailed account of disbursement is made up quarterly, showing all the charges paid in the quarter for which it is rendered; it is submitted to the wardens' committee, signed by the deputy master and two wardens, and transmitted with the vouchers to the Board of Trade.

P. H. BERTHON, Secretary.
Trinity House, London,
1st March 1860.

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CONSTITUTION OF GENERAL AUTHORITY.

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ENGLAND.

RETURN TO REQUISITION, dated 10th June, 1859.

Circular I.
Question
XIV.

2. NAMES of all OFFICERS on or connected with the Establishment of the TRINITY HOUSE of DEPTFORD-LE-STROUD, employed in the Departments of LIGHTS, BUOYS, and BEACONS, stating Ages and Dates of Appointment, and specifying Office held, duties performed, and amount of Salaries and allowances of each.

NAME.	Age next Birthday.	Date of Appointment.	Office held and Duties performed.	Amount of Salaries and Allowances of each.	Actual Salary at present date.
					£ s. d.
Peter Henry Berthon -	62	10 October 1816	Secretary - - - -	1,000 <i>l.</i> increasing by 50 <i>l.</i> per ann. to 1,200 <i>l.</i>	1,200 0 0
George Herbert -	44	26 Dec. 1832	Assistant Secretary - - -	600 <i>l.</i> increasing by 25 <i>l.</i> per ann. to 800 <i>l.</i>	700 0 0
Robin Allen -	39	24 April 1837	Senior Clerk, Secretary's Office - - -	300 <i>l.</i> increasing by 20 <i>l.</i> per ann. to 600 <i>l.</i>	460 0 0
William Townley -	42	25 Jan. 1838	" Collection Account Office - - -		460 0 0
Charles G. Maclean -	39	22 Nov. 1838	" Light Committee - - -		500 0 0
John Inglis -	28	7 Dec. 1847	" Account Office - - -		380 0 0
C. A. F. Brad -	45	At Custom House for light duty work, 18 Aug. 1830; transferred to Trinity House 2 Jan. 1837.	Assistant Clerk, Light Committee - - -	220 <i>l.</i> increasing 10 <i>l.</i> per ann. without limitation.	410 0 0
H. L. Farrer -	29	2 Nov. 1852	Assistant Clerk, Account Office - - -	200 <i>l.</i> increasing by 10 <i>l.</i> per ann. to 300 <i>l.</i>	240 0 0
J. M. Wingfield -	25	25 Feb. 1850	" Secretary's Office - - -		230 0 0
H. J. Parc -	25	29 Sept. 1853	Junior Clerk, Secretary's Office - - -	80 <i>l.</i> increasing by 10 <i>l.</i> per ann. to 200 <i>l.</i>	140 0 0
J. M. Duncan -	28	1 Jan. 1856	" at Blackwall - - -		120 0 0
J. E. Brain -	21	8 " "	" Secretary's Office - - -		120 0 0
J. H. Poulter -	20	3 June 1856	" Account Office - - -		120 0 0
E. Darvall -	22	5 Aug. 1856	" Collection Account Office - - -	110 0 0	
J. Mayo -	27	2 Sept. 1856	" Account Office - - -	110 0 0	
T. Eyton -	18	25 May 1859	" Collection Account Office - - -	90 0 0	
T. H. Howe -	18	28 Feb. 1860	" " - - -	80 0 0	
H. F. Fremont -	46	20 July 1852	Librarian and Keeper of Charts - - -	66 <i>l.</i> 13 <i>s.</i> 4 <i>d.</i>	66 13 4
Professor Faraday -	—	4 Feb. 1836	Scientific Adviser in Experiments on Lights, &c. - - -	200 <i>l.</i>	200 0 0
James Walker -	—	1 Jan. 1858 } At a salary.	Engineer in Chief - - - -	1,500 <i>l.</i>	1,500 0 0
Nicholas Douglass -	60	5 Jan. 1847	Superintending Engineer - - - -	300 <i>l.</i>	300 0 0
Richard Suter -	62	" 1822	Clerk of the Works - - - -	100 <i>l.</i>	100 0 0
Thos. Gaster -	60	14 July 1856	Surveyor of Shipping - - - -	80 <i>l.</i>	80 0 0
C. H. Simmonds -	55	12 July 1832	Messenger - - - -	70 <i>l.</i> increasing 2 <i>l.</i> per ann. to 110 <i>l.</i> Apartments, &c. 2 suits of clothes, and 1 hat.	110 0 0
Ed. Long -	42	4 June 1841	Ditto - - - -		108 0 0
Chas. Dubery -	27	20 Feb. 1855	Ditto - - - -	70 <i>l.</i> increasing 2 <i>l.</i> per ann. to 100 <i>l.</i> , 2 suits and 1 hat.	80 0 0
Jas. Gordon -	31	8 April 1858	House Messenger - - - -	70 <i>l.</i> increasing 2 <i>l.</i> per ann. to 100 <i>l.</i> Boards in house. 2 suits and 1 hat.	72 0 0
Jas. Perkins -	60	" 1843	Gatekeeper - - - -	1 <i>l.</i> 1 <i>s.</i> pr. wk. } 1 suit	1 <i>l.</i> 1 <i>s.</i> pr. wk
Wm. Wilsner -	49	30 March 1858	Night Watchman - - - -	1 <i>l.</i> pr. wk. } & 1 hat.	1 <i>l.</i> pr. wk.
Mrs. Keighley -	64	1 July 1841	Housekeeper - - - -	80 <i>l.</i> increasing 2 <i>l.</i> to 100 <i>l.</i>	100 0 0
A staff of eight Domestic Female Servants, whose wages amount in aggregate to				115 <i>l.</i> per ann.	

The Clerks in the Ballast Office are under the same Order in Council as that which regulates the Department of Lights, Buoys, and Beacons, and promotions or transfers from one to the other are common to both.

In addition to the foregoing a Temporary Clerk has been found necessary in the Collection Account Office.

Trinity House, London, 18th April 1860.

P. H. BERTHOE, Secretary.

XV.

RETURN TO REQUISITION, dated 10th June, 1859.

QUESTION 3.—“System of nomination of all officers connected with the Light, Buoy, and Beacon Departments of the Trinity House, system and subjects of examination (if any) previous to appointment and names of examiners.”

Official Establishment.

“Regulations for the nomination and examination of candidates for appointment to the official establishment of the corporation” are as follows:—

Nomination of Candidates.—First.—That on the occurrence of a vacancy in the official establishment, there shall be five candidates nominated for competitive examination, as herein-after provided.

Secondly.—That the deputy master shall have the right of nominating two of the said five candidates, the remaining three being nominated by the Elder Brethren in turn, according to seniority of election.

Thirdly.—That the age of eligibility for nomination as a candidate shall not exceed 20 years, nor be under 16½ years.

Examination of Candidates.—Fourthly.—That the competitive examinations herein-before provided shall be con-

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ducted by the secretary and accountant under the immediate direction of the deputy master and wardens, by whom the examination papers shall be previously approved.

Fifthly.—That the said committee of deputy master and wardens shall receive the report of the secretary and accountant on the completion of each examination, and shall submit the same to the court or board, as the case may be, with their recommendation thereon.

Sixthly.—That in the event of its being shown by the result of any such examination, that a candidate is so far deficient in his knowledge of the several subjects on which he has been examined, as to render it improbable that he will become within a reasonable period of time qualified for appointment as a clerk on the establishment, the same shall be stated by the committee in their report, and such candidate shall not be eligible for nomination on any subsequent vacancy.

The subjects of examination are correspondence, dictation, arithmetic, geography, French translation.

At the commencement of the proceedings the name of each candidate is placed in an envelope, which is sealed and marked with a distinguishing letter, the same letter being also affixed to his papers. The committee have the papers before them when the report of the examiners is considered,

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*Lighthouse Service.*Circular I.
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XV.

and forward them to the board with their recommendation, without knowledge of the name of the candidate they approve. After the board have finally determined on the selection to be made, the corresponding envelope is opened, and the name of the successful competitor becomes known. Each candidate is required to produce certificates of his age, of his being of sound health, and of character from his last schoolmaster or employer.

Steam and Sailing Vessel Service.

Seamen under 35 years of age who can furnish certificates of good character are selected by the light committee, and, if approved, are appointed by the board. Apprentices are taken by the Corporation for seven years, and should their conduct prove satisfactory throughout that term, and they desire to remain in the service, preference is given to them for appointment as second mates. Both mates and masters undergo strict examination in pilotage and navigation by the examining committee. Superintendents of districts are generally selected from this service.

Candidates for admission are nominated by the Elder Brethren in turn, and if they can produce satisfactory certificates of age (which must be under 28 years), qualification, character, health, and previous occupation, they are recommended by the light committee for appointment to the board. These men are subjected to a course of preliminary instruction whilst supernumeraries at Blackwall.

Light Vessel Service.

Seamen under 28 years of age, who can furnish certificates of good character, are selected by the light committee, and appointed by the board. The inferior officers (lamp-lighters) are chosen from such men in this class as can read and write, and are further promoted, upon good conduct and as vacancies occur, to be mates and masters, undergoing for these latter offices a special examination as to their knowledge of the locality in which the light vessel is stationed.

Trinity House, London,
18th April, 1860.P. H. BERTHOX,
Secretary.

XVI.

XVI.

RETURN TO REQUISITION dated 10th June 1859.

XVI.

LIST OF PERSONS IN RECEIPT OF PENSIONS, SUPERANNUATIONS, OR SIMILAR ALLOWANCES derived from SERVICES connected with the LIGHTS, BUOYS, AND BEACONS DEPARTMENTS, their AGES, the DATE OF SUPERANNUATION, LENGTH OF SERVICE, and reason assigned for placing them on the RETIRED LIST, stating AMOUNT OF PENSION, SUPERANNUATION, OR ALLOWANCE paid to each in 1851 and 1858.

NAME.	Age when Pensioned.	Date of Superannuation.	Length of Service.	Reason assigned.	Amount paid in		REMARKS.
					1851.	1858.	
Clarke, James	32	July 1822	4	Mental imbecility (caused by fright and injuries received at a fire in lighthouse, when his wife and five children were suffocated).	£ s. d. 12 0 0	£ s. d. 12 0 0	
Turner, Eliza	39	Aug. "	—	Widow of a lightkeeper -	6 0 0	6 0 0	
Thompson, Martha	—	June 1824	—	Do. do. -	6 0 0	—	
Girdlestone, Mary	54	5 July 1827	—	Do. master of a lightvessel	20 0 0	20 0 0	
Nutter, Ann	41	7 Aug. 1828	—	Do. seaman do.	6 0 0	6 0 0	
Oldman, Mary	47	4 June 1829	—	Do. store and tender keeper.	6 0 0	6 0 0	
Davie, Ann	—	5 Nov. "	—	Widow of an agent -	25 0 0	—	
Stott, Elizabeth	34	Oct. 1830	—	Do. of a steward in yacht service.	10 0 0	10 0 0	
Davies, William	54	4 Oct. 1832	22	—	20 0 0	20 0 0	
Davey, Ann	33	3 Jan. 1833	—	Widow of a mate in lightvessel service.	8 0 0	8 0 0	
Cribb, William	58	7 Nov. "	31	Age and infirmity -	14 0 0	—	
Race, Harriet	63	7 Jan. 1836	—	Widow of an agent -	30 0 0	30 0 0	
Comben, Mary	51	6 June "	—	Daughter of a lightkeeper -	10 0 0	10 0 0	
Comben, Jane	49	" "	—	Do. do. -	10 0 0	—	
McAusland, Peter	—	6 Sept. "	17½	Injuries received, and infirmities -	17 0 0	—	
Green, Elizabeth	44	March 1837	—	Widow of a seaman (husband drowned).	6 0 0	—	
Thomas, Ann	—	Nov. "	—	Widow of a seaman -	6 0 0	6 0 0	
Adams, Elizabeth	—	" "	—	" -	10 0 0	—	
Cloade, William	—	July 1838	17	Injuries received -	20 0 0	—	
Fox, Henry	—	Dec. "	50	Advanced age (revision of appointments to stations).	25 0 0	—	
Bishop, Mary	—	" "	—	Widow of a lightkeeper -	25 0 0	—	
Colreйн, Elizabeth	46	Dec. "	20	Lightkeeper, revision of appointments to stations.	40 0 0	40 0 0	
Fagg, Elizabeth	52	" "	22	Lightkeeper, revision of appointments to stations.	40 0 0	40 0 0	
Dawson, Sarah Ann	34	Feb. 1839	—	Widow of a seaman -	6 0 0	—	
Fassam, Mary	49	" "	—	Do. do. -	6 0 0	6 0 0	
Lamping, Sarah	70	" "	—	Do. lightkeeper -	12 0 0	9 14 4	Died in 1858.
Loosemore, Nanny	70	" "	—	Do. master of a lightvessel	20 0 0	20 0 0	
Cornish, James	62	Aug. "	19	Rheumatism and spasms -	31 10 0	31 10 0	
Mauday, Caroline	64	Sept. "	—	Widow of a cook -	6 0 0	6 0 0	
Jones, Penelope	44	Oct. "	—	Lightkeeper (superannuated to render the station more effective).	25 0 0	25 0 0	
Brown, Amy	40	Nov. "	—	Widow of a workman (husband drowned while on duty).	20 0 0	20 0 0	
Simmons, Elizabeth	42	Dec. "	—	Widow of a lightkeeper -	15 0 0	15 0 0	
Thurgar, Dennis	59	Jan. 1840	19	Age and infirmity; incapable of further duty.	9 0 0	—	
Oliver, William	67	" "	33	Age and infirmity; incapable of further duty.	13 10 0	—	
Morley, Mary	66	May "	—	Widow of a lightkeeper -	15 0 0	15 0 0	
Goddard, Joseph	—	Oct. "	21	Transfer of agency; compensation allowance granted.	40 0 0	40 0 0	

XVI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XVI.

ENGLAND.

LIST OF PERSONS IN RECEIPT OF PENSIONS, &c.—continued.

Circular 1.
Question
XVI.

NAME.	Age when Pensioned.	Date of Superannuation.	Length of Service.	Reason assigned.	Amount paid in		REMARKS.
					1851.	1858.	
Wilson, John	—	Oct. 1840	11½	Agency abolished : compensation allowance granted.	£ 13 6 8	s. 6 13 4	
Cock, William	66	June 1841	28	Advanced age, &c.	35 0 0	—	
Thompson, Sally	—	" "	36	Lightkeeper, age, &c.	22 10 0	—	
Richardson, Robert	—	" "	25	" "	29 0 0	—	
Sherries, Mary	64	Aug. "	—	Widow of a lightkeeper	12 0 0	12 0 0	
Stratton, Elizabeth	60	Sept. "	—	Do. do.	15 0 0	15 0 0	
Troth, Judith	70	Dec. "	—	Do. do.	15 0 0	—	
Vansten, James	52	Jan. 1842	17	Inability to perform further duties from injuries received.	40 0 0	40 0 0	
Williams, John	68	July "	16	For loss of situation as coxswain at Skerries under former proprietors.	3 0 0	—	
Gurney, Leonard	66	Sept. "	—	Infirmities of age	90 0 0	—	
Spence, Hannah	53	Feb. 1843	—	Widow of a tender keeper	6 0 0	6 0 0	
Fairchild, Ann	57	" "	—	Do. lightkeeper	20 0 0	20 0 0	
Websdale, William	51	March "	16	Spinal affection	1 5 4	—	
Iddes, George	57	May "	29	Unfit for further duty	12 10 0	—	
Bailey, Elizabeth	56	" "	—	Widow of a master	20 0 0	20 0 0	
Daines, Elizabeth	67	" "	—	Widow of a seaman	6 0 0	—	
Finch, John	61	Aug. "	—	Age and infirmity	38 0 0	—	
Jones, Elizabeth	—	Oct. "	—	Widow of an Elder Brother drowned while on duty.	100 0 0	50 0 0	(½ year.)
Lewis, George	—	Nov. "	27	Age and infirmity	28 0 0	4 11 0	Died in 1858.
Stedder, Step. H.	67	Jan. 1844	14	Agency for the Flathelm light abolished. Compensation allowance granted.	12 0 0	176 7 6	Compensation upon collection at Bristol being placed in hands of Collector of Customs.
Bly, Thomas	40	Feb. "	13	Hypochondriack irritation, unfit for further duty.	10 0 0	—	
Fisk, Sarah	47	Oct "	—	Widow of a mate	10 0 0	10 0 0	
George, Mary	38	Nov. "	—	Do. seaman	6 0 0	6 0 0	
Evans, Grace	—	7 Jan. 1845	—	Do. an agent	30 0 0	—	
Davey, Elizabeth	43	4 Feb. "	—	Do. a lamplighter	6 0 0	6 0 0	
Smith, James	60	" "	25	Age and ill health	23 12 6	—	
Terry, William	62	" "	9	Do. do.	11 5 0	11 5 0	Died in 1851.
Perryman, Benjamin	59	March "	23	Do. infirmity	24 16 0	—	
Hasling, Thomas	63	6 May "	22	Do. do.	12 10 0	—	
Wilson, Isaac	65	" "	38	Do. do.	13 10 0	—	
Musgrove, John	49	" "	20	Injuries received while in execution of duty.	10 0 0	18 5 0	Increased in 1852.
Jones, Elizabeth	36	" "	—	Widow of a lightkeeper (husband drowned while on duty).	6 0 0	—	
Jones, Ann	64	June "	—	Lightkeeper, age, &c.	30 0 0	—	
McLeod, Daniel	47	14 Oct "	19	Gravel complaint, &c.	50 0 0	50 0 0	
Farrett, Thomas	57	4 Nov. "	30	Rheumatism and weakness of sight.	12 10 0	12 10 0	
Ellis, Francis	75	2 Dec. "	42	Advanced age	50 0 0	—	
Hland, Peter	50	" "	32	Mental and bodily infirmity	35 0 0	35 0 0	
Puxley, William	60	3 Mar. 1846	24	Age and infirmity	16 10 0	16 10 0	Increased, Oct. 1853.
Stacey, James	47	" "	20	" "	10 0 0	15 12 0	
Fletcher, Ann	—	4 Aug. "	—	Widow of a lightkeeper	6 0 0	6 0 0	
Bartlett, William	63	Sept. "	21	Infirmities of age, &c.	10 0 0	10 0 0	
Wood, Elizabeth	—	2 Feb. 1847	—	Widow of a lamplighter	6 0 0	—	
Snooks, William	54	" "	35	Age and inability to perform his duties efficiently.	21 0 0	21 0 0	
Davis, Elizabeth	—	4 May "	—	Widow of a master	20 0 0	15 5 5	Died in Oct. 1858.
Weynton, Maria	49	18 "	—	Widow of an Elder Brother who died from exposure, &c. in execution of duty.	150 0 0	150 0 0	
Jones, William	62	5 Oct. "	23	Defective vision, rheumatism, &c.	9 0 0	9 0 0	
Hall, Ann	46	7 Mar. 1848	—	Widow of a lamplighter	6 0 0	—	
Clemens, John	53	" "	23	Enlargement of the heart, &c.	25 0 0	—	
Cowdry, Mary Ann	47	" "	—	Widow of a seaman	6 0 0	6 0 0	
Hawkins, James	61	" "	28	Age and infirmity	30 0 0	—	
St. Leger, Susannah	40	2 May "	—	Widow of a lightkeeper	12 0 0	—	
Langham, Sarah	69	6 June "	—	Do. lamplighter	6 0 0	—	
Oxford, Emma	38	4 July "	—	Do. master of a lightvessel	10 0 0	10 0 0	
Elliott, Alice	50	" "	—	Do. do.	20 0 0	20 0 0	
Smith, William	68	1 Aug. "	40	Age and infirmity	40 0 0	40 0 0	
Elliott, Christiana	51	Oct. "	—	Widow of a lamplighter	6 0 0	6 0 0	
Robinson, Ann Eliz.	55	2 Jan. 1849	—	Do. do.	6 0 0	6 0 0	
Harris, Sarah	72	6 Mar. "	—	Do. master	20 0 0	20 0 0	
Barnard, Robert	54	" "	22	Injuries received while on duty	12 10 0	12 10 0	
Milbank, Joseph	49	" "	17	Rheumatic affection	12 10 0	12 10 0	
Houguez, Louis	56	5 June "	21	Bad health	55 0 0	55 0 0	
Scarfiefield, Ann	—	7 Aug. "	—	Widow of a mate of lightvessel	10 0 0	10 0 0	
Hudson, Susan	46	2 Oct. "	—	Do. cook	6 0 0	6 0 0	
Anderson, Eleanor	—	Jan. 1850	—	Do. seaman	6 0 0	—	
Townley, Charles	70	5 Feb. "	43	Advanced age	300 0 0	—	
Hutton, Joshua	65	" "	25	Age and infirmity	16 10 0	14 4 8	Died in 1858.
Shorten, Harvey	67	5 Mar. "	36	Do. do.	13 10 0	13 10 0	
Friedericks, Paul	—	2 April "	21	Ill health	23 0 0	23 0 0	
Gilpin, Mary	—	May "	—	Wife of a lightkeeper ; husband a lunatic.	26 0 0	26 0 0	

NAME.	Age when pensioned.	Date of Superannuation.	Length of Service.	Reason assigned.	Amount paid in		REMARKS.
					1851.	1858.	
Yates, James -	58	4 June 1850	25	Defective vision and other infirmities.	£ s. d. 13 10 0	£ s. d. —	
Kendrick, Thomas -	63	2 July "	23	Age and infirmity - - -	31 10 0	31 10 0	
Simpson, Sarah -	64	" "	—	Widow of a lightkeeper - -	12 0 0	12 0 0	
Jenkins, Thomas -	—	3 Sept. "	—	Hopeless condition of health -	18 5 0	18 5 0	
Gybas, George -	65	5 Nov. "	36	Infirmities of age and weakness -	21 0 0	5 5 0	Died in 1858.
Riberaft, Mary -	—	" "	—	Widow of a master - - -	17 0 0	—	
Smith, William -	48	" "	11	Spasmodic affection which causes the passing of gall stones.	16 0 0	16 0 0	
Thomas, William -	59	Dec. "	25	Inability to perform his duties -	25 0 0	—	
Knott, John -	30	" "	9	Consumption - - -	22 10 0	—	Granted half salary. Died 1851.
Chadd, Rachael -	38	Feb. 1851	—	Widow of a lamplighter - - -	6 0 0	6 0 0	
Christophers, George -	42	" "	8	Insane - - -	13 15 0	18 4 0	
Maxted, Samuel -	62	Mar. "	24	Age and infirmity - - -	14 17 0	—	
Knott, Matilda -	34	May "	—	Widow of a lightkeeper - - -	15 0 0	—	A Donation.
Thomas, Ann -	—	June "	—	Do. lamplighter - - -	5 10 0	—	
White, Henry A. -	47	July "	26	Declining health - - -	66 12 2	101 5 0	
Whitcar, Maria -	58	" "	—	Widow of a lamplighter - - -	4 5 0	6 0 0	($\frac{2}{3}$ year.)
Panel, Charles -	43	4 Nov. "	17	Diseased lung - - -	2 1 8	12 10 0	
Bowen, William -	71	9 Dec. "	14	Age and infirmity - - -	0 5 10	7 0 0	
Smith, Sarah -	—	" "	—	Widow of a lightkeeper - - -	—	12 10 0	
Maxted, Sarah -	51	6 July 1852	—	Do. lamplighter - - -	—	6 0 0	
Follard, John -	81	31 Aug. "	4	Injured spine - - -	—	24 0 0	
Griffiths, Hugh -	77	5 Oct. "	42	Advanced age - - -	—	55 0 0	
Trahair, Richard -	55	2 Nov. "	21	Chronic disease of the stomach, with bronchitis.	—	27 1 8	($\frac{1}{4}$ year.)
Miller, James -	66	7 Dec. "	23	Age and infirmity - - -	—	12 3 4	
Simmons, Matilda -	52	5 April 1853	—	Widow of a mate - - -	—	4 0 0	
Comben, Robert -	72	" "	17	Rupture, defective sight, and advanced age.	—	20 0 0	
Hayhow, Arthur -	64	2 June "	41	Advanced age and ill health - -	—	40 0 0	
Whiley, William -	—	1 July "	8	Insane delusions - - -	—	13 13 0	($\frac{3}{4}$ year.)
Grylls, Mary -	66	" "	—	Widow of a lightkeeper - - -	—	11 7 8	
Cribb, Joseph -	50	" "	30	Impaired state of health - - -	—	25 0 0	
Hodges, Thomas -	59	2 Aug. "	30	Gout - - -	—	75 0 0	
Butterfield, Charles -	57	6 Sept. "	42	Impaired vision. - - -	—	600 0 0	
Artis, Edmund -	68	27 " "	41	Defective vision, advanced age, &c.	—	50 0 0	
Pendar, Jane -	—	18 Oct. "	—	Widow of a seaman - - -	—	2 7 0	
Knight, Sarah Ann -	46	24 Jan. 1854	—	Do. do. - - -	—	2 7 0	
Yates, Mary Ann -	—	2 May "	—	Do. do. - - -	—	4 14 0	
Ditcham, John -	61	June "	32	Age and infirmity - - -	—	40 0 0	
Howard, Ann -	60	" "	—	Widow of a lightkeeper - - -	—	12 12 8	
Boyns, Nicholas -	70	" "	32	Advanced age - - -	—	31 5 0	($\frac{1}{4}$ year.)
Owen, William -	69	" "	21	Age and infirmity - - -	—	21 13 4	
Ablett, James -	69	Aug. "	45	Do. - - -	—	55 0 0	
Green, James -	74	Oct. "	41	Advanced age - - -	—	40 0 0	
Richardson, Harriet -	32	" "	—	Widow of a lightkeeper - - -	—	11 13 4	
Segar, Martin -	65	" "	13	Rheumatism, age, &c. - - -	—	8 11 0	
Mackenzie, Mary -	40	" "	—	Widow of a lightkeeper - - -	—	3 15 0	
Littleboy, Richard -	40	Dec. "	12	Extreme debility - - -	—	8 5 0	
Button, John -	39	" "	14	Partially paralysed from fits of epilepsy.	—	7 1 0	
Page, Mary -	67	" "	—	Widow of a lightkeeper - - -	—	5 4 2	Died in 1858.
Richards, Benjamin -	—	" "	15	Injured through a fall, and erysipelas in the face.	—	7 1 0	
Hodgson, Sarah -	69	June 1855	—	Widow of a lightkeeper - - -	—	7 10 0	($\frac{3}{4}$ year.)
Smith, Ann -	—	" "	—	Do. do. - - -	—	16 13 4	
Young, Susanna -	—	" "	—	Do. lamplighter - - -	—	1 6 0	Died in 1858.
Cotton, Benjamin -	—	May "	43	Transfer of collection of light duties at London to Her Majesty's Customs.	—	608 6 8	
Dural, Philip S. -	58	" "	31	—	—	320 0 0	
Williams, William -	—	July "	31	—	—	320 0 0	
Cole, Julius W. -	57	" "	31	—	—	300 0 0	
Baldwin, Mary Ann -	60	Aug. "	—	Widow of a seaman - - -	—	5 9 8	
Powditch, Bridget -	58	" "	—	Do. master - - -	—	13 6 8	
Elliston, Thomasina -	—	" "	—	Do. mate - - -	—	4 0 0	
Taylor, Sarah Ann -	30	" "	—	Do. district agent - - -	—	14 19 0	
Dale, Sarah Ann -	52	Nov. "	—	Do. master of a lightvessel -	—	16 13 4	
Hurry, George Y. -	—	Dec. "	26	Alteration in arrangements for collection at Liverpool.	—	225 0 0	
Clousten, Ann -	43	5 Feb. 1856	—	Widow of a lightkeeper - - -	—	3 15 0	
Graham, Eliza -	53	" "	—	Do. do. - - -	—	6 13 4	
MeAusland, Mary -	74	" "	—	Do. master - - -	—	5 13 4	
Herbert, Jacob -	68	4 Mar. "	53	Advanced age - - -	—	1800 0 0	
Cole, Elizabeth -	74	10 " "	—	Widow of a buoykeeper - - -	—	2 10 0	
Fortune, William -	71	May "	15	Advanced age and infirmity -	—	9 0 0	
Jenkins, Jane -	45	" "	—	Widow of a seaman - - -	—	2 10 0	
Hall, James -	83	16 July "	22	Advanced age - - -	—	26 13 4	
Comben, Richard -	64	24 Aug. "	38	Liver complaint, age, &c. - - -	—	48 15 0	
Lloyd, William -	38	16 Sept. "	13	Afflicted with hydrocele and chronic rheumatism.	—	10 10 0	

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CONSTITUTION OF GENERAL AUTHORITY, &c.

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ENGLAND.

LIST OF PERSONS IN RECEIPT OF PENSIONS, &c.—continued.

Question XVI.

NAME.	Age when pensioned.	Date of Superannuation.	Length of Service.	Reason assigned.	Amount paid in		REMARKS.
					1851.	1858.	
Harvey, John	53	24 Oct. 1856	22	General debility - - -	£	s. d.	£ s. d.
Bly, Anna Maria	57	11 Nov. "	—	Widow of a lamplighter - -	—	—	21 13 4
Furzey, Elizabeth	56	24 Dec. "	—	Do. master - - -	—	—	3 6 8
Butterfield, John Henry.	35	25 " "	17	Precarious state of health greatly interfering with official attendance.	—	—	10 0 0
Lock, Benjamin	73	24 Feb. 1857	48	Advanced age and extreme debility	—	—	75 19 0
Hovgego, William	68	" "	27	Age and incapacity - - -	—	—	55 0 0
Richards, Roger	79	24 April "	35½	Advanced age and infirm health -	—	—	27 1 8
Nicholas, Benjamin	69	" "	19½	Do. do. - - -	—	—	52 10 0
Banks, Isaac Carr	62	24 July "	42	General ill health, defective vision, &c.	—	—	10 8 0
Taylor, Martha	27	Sept. "	—	Widow of a lightkeeper - -	—	—	47 0 0
Thomas, Mary	44	19 " "	—	Do. do. - - -	—	—	3 15 0
Holcomb, John	61	24 " "	32	Infirmity and inefficiency for further service.	—	—	7 4 4
Eitherdon, Robert	40	Oct. "	19½	Extreme debility, resulting from severe inflammation of kidneys.	—	—	26 10 0
Sydney, John	64	" "	32	Loss of memory, nerve, &c. -	—	—	123 6 8
Brewer, Marnaduke	—	18 Nov. "	20½	Alteration in arrangement for collection at Newport.	—	—	40 0 0
Phillips, John S.	—	" "	20½	Alteration in arrangement for collection at Newport.	—	—	10 1 3
Mayor, William	58	24 " "	47	Incapacitated for further service -	—	—	51 17 9
Ellender, James	70	" "	30	Infirmities of age - - -	—	—	50 0 0
Cooper, James	45	" "	20	Impaired state of health - -	—	—	18 16 0
Gibbs, Mary Ann	64	29 Dec. "	—	Widow of a mate - - -	—	—	17 6 8
Gowing, Sarah	62	12 Mar. 1858	—	Do. master - - -	—	—	7 3 11
Parsons, William	73	10 April "	36	Infirmities of age - - -	—	—	4 9 4
Wallace, Frances	42	9 May "	—	Widow of a blacksmith - - -	—	—	27 12 10
Barnby, Harriet	61	2 June "	—	Do. lightkeeper - - -	—	—	3 16 0
Bone, William	73	25 June "	31	Age and infirmity - - -	—	—	6 19 2
May, Sammel	52	" "	22	Total inefficiency for further service.	—	—	9 8 0
Dibbens, James	65	6 July "	20	Rupture and infirmities of age -	—	—	7 10 5
Winter, John	68	22 " "	21	Age and infirmity - - -	—	—	6 8 7
Watson, Hannah	37	22 Sept. "	—	Widow of a carpenter - - -	—	—	1 1 1

Trinity House, London, E.C.,
4th May 1860.

P. H. BERTHOE, Secretary.

XVII.

RETURN TO REQUISITION, dated 17th June 1859.

XVII.

XVII.

SHOWING THE NAMES OF THE various LOCAL AGENTS and SUPERINTENDENTS OF DISTRICTS, the Dates of their Appointments, their Profession or Employment at the time of their Employment, the Salaries and Allowances paid to each.

NAME.	District.	Date of Appointment.	Profession or Employment at time of Appointment.	Salary and Allowances.
King, S. M.	Fern Lights	16 Nov. 1858	Pilot Master and Buoy Keeper under Trinity House, Newcastle; assisting his father as Corporation Agent.	30l. per annum.
Darling W. B.	Coquet Light and Buoys.	8 Sept. 1859	A Lightkeeper in the service.	No allowance beyond pay as keeper (65l.)
Wescroft, Samuel	Tinmouth Light	1841	A Lightkeeper in service of previous proprietors.	Ditto Ditto (80l.)
Lister, John	Tees Buoyage, &c.	April 1860	Assisting his father, the previous agent	160l.
Gatenby, John	Flambro and Whitley Lights, Whitley Rock Buoy	9 Nov. 1858	Retired Master of a Ship to India and Australia.	30l.
Davie, William	Yarmouth District	6 Nov. 1829	Clerk and Assistant to his father, the previous superintendent.	280l.
Sandford, Henry	Cromer Light	3 Sept. 1835	Coal Merchant and Shipowner	30l.
Rising, Robert	Winterton Light	12 July 1841	Auditor of Poor Law Union, Commissioner of Bankrupts, &c. &c.	30l.
Sturges, William	Haisbro' Lights	7 Nov. 1833	Engaged in agricultural pursuits	50l.
Johnstone, T. M.	Woodbridge Buoys	June 1854	Collector of H. M. Customs	10l.
Poulter, Jonathan	London District	22 Dec. 1837	A Master in the Corporation's Steam Vessel Service.	450l., house, coals, &c.
Lightvessel Master on Shore from Shipwash, Cork, or Sunk.	Sub-District—Harwich.	- - -	- - -	No allowance beyond pay as masters.
Carey, D.	Reculvers	Dec. 1840	Expeditior to the Sewers Commissioners and a Landowner.	10l.
White, James	Ramsgate District	2 Oct. 1855	A Mate in the Steam Vessel Service of the Corporation.	160l., and victualling allowance, when aloft.
Hewett, James	Beachy Head Light	Sept. 1828	A Lieutenant, R.N.	40l.

II.

E

ENGLAND.
Circular I.
Question
XVII.

XVII. to XXI.

CONSTITUTION OF GENERAL AUTHORITY. &c.
NAMES OF LOCAL AGENTS, &c.—continued.

XVII. to XXI.

NAME.	District.	Date of Appointment.	Profession or Employment at time of Appointment.	Salary and Allowances.
Willis, Robert - -	Isle of Wight District.	2 Nov. 1847	Master of Trinity House Tender	120 <i>l.</i> , and victualling allowance when afloat.
Barbenson, T. N. -	Caskets Lights -	11 Nov. 1856	Queen's Procurer, Alderney, and General Agent.	35 <i>l.</i>
Ditcham, T. E. -	Plymouth District	27 Feb. 1844	Master Mariner in Foreign and Coasting Trade upwards of 20 years.	154 <i>l.</i> 7 <i>s.</i> 6 <i>d.</i> , and victualling allowance when afloat.
Pyne, H. I. - -	Exeter Buoys -	June 1853	Assisting his father, the previous agent	25 <i>l.</i>
Tregarthen, Hugh -	Scilly District -	5 Oct. 1841	Shipmaster in the foreign trade	100 <i>l.</i> , and victualling allowance when afloat.
Tremearne, J. N. -	Longships and Godrevy Lights.	16 Nov. 1858	Agent to Lloyd's, &c. &c.	30 <i>l.</i>
Jones, William -	Burnham Lights -	1829	Comptroller of Customs at Bridge-water.	20 <i>l.</i>
Kynaston, Cabot -	Caldy Light -	1829	Proprietor and Farmer of Caldys Island.	40 <i>l.</i>
Bailey, B. IL - -	Milford District -	31 Oct. 1843	Master in Steam Vessel Service of the Corporation.	280 <i>l.</i> , and victualling allowance when afloat.
Cox, Joseph - -	Bideford Buoys	April 1856	Pilot - - - - -	10 <i>l.</i>
Richards, T. - -	Carmarthen -	Jan. 1845	Master Mariner - - - - -	20 <i>l.</i>
Master or Mate of English and Welsh Grounds Lightvessel.	Bristol Channel	- - - - -	- - - - -	No allowance beyond pay in lightvessel service.
Lewis, Ives - - -	Aberdovey - - -	April 1860	Master Mariner - - - - -	6 <i>l.</i>
Jones, John - - -	Conway - - - -	March 1828	On board a private yacht - - - - -	12 <i>l.</i>
Barnett, Stephen -	Dee - - - - -	May 1837	Mate of the Nore Lightvessel - - - - -	62 <i>l.</i> , and victualling-allowance 1 <i>s.</i> 6 <i>d.</i> per diem.
Gatké, Henry - -	Heligoland - -	9 Oct. 1856	Governor's Clerk and Interpreter to the Government of the Island.	40 <i>l.</i>
Terry, John - - -	Gibraltar - - -	Oct. 1844.	Senior Clerk in Port and Quarantine Department at Gibraltar.	40 <i>l.</i>

Trinity House, London, 18th April, 1860.

P. H. BERTHOE, Secretary.

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A RETURN showing the NUMBER OF CRAFT of all DENOMINATIONS maintained by the ELDER BRETHREN in the several DISTRICTS under their control the NUMBER OF MEN employed in such BOATS or VESSELS; and the whole SUM expended in SALARIES, and in maintaining the same; and also the EXPENSE incurred in each year since 1853, in the HIRE OF BOATS, VESSELS, &c.

CRAFT.	Districts.	Number of Men employed.	Wages.	Maintenance.	Total.
			£ s. d.	£ s. d.	£ s. d.
Beacon (steam vessel) - -	Yarmouth - - -	8	775 4 5	1,262 0 0	2,037 4 5
Sunk Sand (sailing vessel) -	Harwich - - -	1	34 6 0	167 1 6	201 7 6
Irene (steam vessel) - - -	London - - -	32	1,721 17 8	3,285 17 5	5,007 15 1
Argus (steam vessel) - - -	Do. - - - - -	28	1,462 19 0	3,281 9 10	4,744 8 10
Lyra (sailing vessel) - - -	Ramsgate - - -	2	35 18 0	186 10 10	222 8 10
Billow do. - - - - -	Cowes - - - -	2	36 18 3	123 16 3	160 14 6
Diligent do. - - - - -	Plymouth - - -	7	229 5 6	244 16 1	474 1 7
Scilly do. - - - - -	Scilly - - - -	1	33 0 0	46 15 1	79 15 1
Satellite do. - - - - -	Bristol Channel	3	114 19 0	216 16 11	331 15 11
Vestal (steam vessel) - - -	Milford - - -	31	1,570 12 1	2,708 7 11	4,279 0 0
	Total - - - -	115	6,014 19 11	11,523 11 10	17,538 11 9

Wages include only the amount paid in money. Victualling and uniform clothing are included in maintenance. "Special Repairs" are not included.

Solva (steam vessel) - - -	Smalls - - - -	} These vessels are temporarily employed at the new works now in course of construction, their maintenance is included in the charge for these works.
Buoy Yacht (sailing vessel) -	Do. - - - - -	
Two Barges - - - - -	Do. - - - - -	
Bishop (steam vessel) - - -	Ilanois - - - -	
Tartoise - - - - -	Do. - - - - -	

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EXPENSE incurred in each year since 1853, in the HIRE OF BOATS, VESSELS, &c.

Year 1854 - - - - -	£ s. d.
" 1855 - - - - -	656 7 2
" 1856 - - - - -	932 16 5
" 1857 - - - - -	799 7 6
" 1858 - - - - -	749 17 9
" 1858 - - - - -	797 6 3

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RETURN TO REQUISITION, dated 17th June, 1859.

"The Names of all Lighthouse Keepers and Masters of Floating Lights appointed since the 1st January 1854, the Date of their Appointment, their Ages at the time of their Appointment, their previous Professions or Employments, their actual Employments when appointed, by whom they were selected, and the mode of Examination (if any), and of testing their Qualifications."

Name.	Date of Appointment.	Age at time of Appointment.	Previous Profession or Employment.	Actual Employment, when appointed, by whom selected, and mode of Examination, &c.
Nutsford, Henry	1854. 20 Mar.	24	Joiner and Cabinet Maker.	Nominations by Elder Brethren in turn, recommendations by light committee in event of certificates, &c. proving satisfactory, for appointment by the Board. Certificates of age (which must now be under 28 years), qualification, character, health, and previous occupation are required. These men are subjected to a course of preliminary instruction without superannuation at Blackwall. * That the same construction of the "Bounty," and at their counterpart were appointed keepers there—the regulation as to age being waived in their favour.
Howard, Fredk. Saml.	20 July	30	Joiner.	
Lewis, William	20 Sept.	30	Blacksmith.	
Williams, Thomas	11 Oct.	25	Labourer.	
(has since left the service)				
Davis, William	21 Nov.	31	Seaman in Corporation's Service.	
	1855.			
Tough, George	20 "	22	Domestic Servant.	
Hollord, Henry	26 "	23	Butcher.	
(too longer in service)				
Bowen, William	3 April	25	Shipwright.	
Shoemack, Francis	28 "	20	Farmer's Labourer.	
Odgers, John	30 July	22	Coastguard.	
Boyle, Owen	15 Oct.	23	Bricklayer.	
	1856.			
Griffiths, John	22 Jan.	26	Painter.	
Davison, Mark Jos.	28 "	29	Painter.	
Frost, William	" "	27	Cabinet Maker.	
Evans, William	" "	25	Domestic Servant.	
Briggs, David	14 Oct.	39	Ditto.	
Russell, Amos	28 "	30	Gardener.	
	1857.			
Eritton, William	7 April	20	Ditto.	
May, Alfred Brombley	25 June	24	Mariner.	
Evans, William	11 Aug.	25	Joiner.	
Godolphin, Walter Sydney	8 Sept.	24	Brush Maker.	
Appleton, Geo. Gershon	" "	26	Painter.	
Ebden, William	6 Oct.	16	Baker.	
	1858.			
Watson, John Henry	26 Jan.	19	Painter.	
Lancelot, Thomas	21 May	24	Domestic Servant.	
Dowes, William	8 June	27	Ditto.	
(has since left the service)				
Boyce, Wm. Henry	15 June	27	Clerk in a Broker's Office.	
Williams, John*	26 July	35	Mason.	
Williams, Thos. Henry	" "	35	Blason.	
Cutting, Thos. Henry	24 Aug.	21	Clerk in a Lawyer's Office.	
Steer, Joseph	2 Sept.	27	Boot and Shoe Maker.	
Hilder, Edward	14 "	20	Shoemaker and Grocer.	
Mayor, Samuel	30 "	23	Saddlemaker.	
Spurr, Frederick	28 Oct.	25	Watch and Clock Maker.	
Hood, Charles	20 Nov.	25	Labourer.	
	1859.			
Warder, Geo. H.	7 Jan.	22	Assisting his father, a Light-keeper.	
John, Chas. Felix	23 Feb.	25	Biscuit Baker.	
Jarvis, John	24 "	19	Domestic Servant.	
Staples, George	24 "	23	Wine Porter, &c.	
Davis, Wm. Legg	3 Mar.	21	Mariner.	
Burgess, Wm. R.	8 "	20	Cooper	
Williams, Richard	1 June	27	Domestic Servant.	
Annett, David	3 Nov.	23	Timms, &c.	
Ricketts, E. J.	24 "	20	Tailor.	
	1860.			
Norton, H. R.	3 Feb.	27	Cabinet Maker.	
Dale, William	11 "	27	Mariner.	
Claxton, R. H.	3 April	18	Domestic Servant.	
Dyer, Saml. E.	7 "	24	Plumber and Pipe-plate Worker.	
Aveston, C. H.	17 "	18	Assisting his father, a Light-keeper.	

Masters of Lightvessels.

Name.	Date of Appointment.	Age at time of Appointment.	Previous Profession or Employment.	Actual Employment when appointed.	By whom selected, and mode of Examination, &c.
Sidney, John	1854. 20 June	61	Lightves- sel service of Corporation.	Mate of Goodwin lightvessel.	By light committee, from inferior grade to an inferior grade, but no previous actual examination made as to their knowledge of the theory in which the lightvessel is placed.
Wright, Edw.	" "	49	"	" Sunk light- vessel.	
Collins, George	26 Sept.	66	"	" Spurn light- vessel.	
Freeman, John	1855. 2 Jan.	48	"	" Helwicks lightvessel.	
Mathewson, Jas.	2 Oct.	47	"	" Swin (Middle) lightvessel.	
Murray, William	1857. 3 Feb.	59	"	" South Sand Head light- vessel.	
White, Thomas	21 July	47	"	" St. Nicholas gatt light- vessel.	
Dale, John	22 Sept.	59	"	" Shipwash lightvessel.	
Hast, William	24 Nov.	42	"	" Shipwash lightvessel.	
	1858.				
Maskell, John	16 Mar.	45	"	" Cork light- vessel.	
Temple, Jas. T.	26 Oct.	48	"	" Seven Stones lightvessel.	
Boxhall, Jas.	1859. 5 April	42	"	" English and Welch Grounds light vessel.	
Barnard, Rob.	2 Aug.	50	"	" Cockle light- vessel.	
Smith, Charles	" "	59	"	" Stanford light- vessel.	
Hall, Henry	" "	50	"	" Owers light- vessel.	
Proom, Robert	16 "	46	"	" Sunk light- vessel.	
Cooper, James	11 Oct.	44	"	" Leman and Ower light- vessel.	
	1860.				
Rees, Joseph	3 April	48	"	" Tongue lightvessel.	

Trinity House, London,
18th April, 1860.

P. H. BERTHOE,
Secretary.

XXVI.

PROPOSED IMPROVEMENTS, INVENTIONS, &c.

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A RETURN showing the NUMBER and DESCRIPTION of PROPOSALS or SUGGESTIONS originating with or made to the ELDER BROTHERS of the TRINITY HOUSE, with a View to the Improvement of the System of Lights, Lighthouses, and Floating Lights, or to the Improvement of the System of Lighting the Coasts, Harbours, and Channels under their Jurisdiction, since the 1st January 1845, with a Statement of the Steps taken in each Case, in conformity with a Requisition from the Royal Commission on Lights, Buoys, and Beacons, dated 24th February 1859.

Section.—Proposals relative to the Nature of Light, or the Materials for producing it, &c.

1845.—By order of Board. The attention of the Corporation had been drawn to rapeseed oil as a substitute for spermaceti oil, and trials of its qualities, with the object of introducing it into use at the

lighthouses and lightvessels, had been made (in 1842) prior to the sitting of a select committee of the House of Commons in 1845, by whom a continuance of the experiments was recommended.

1845, July.—Special Committee appointed to test Messrs. Briggs' patent refined rapeseed oil. They report that it justifies expectation of economical and otherwise advantageous use.

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August.—Reference had to Professor Faraday, who reports favourably both of the oil and of a patent lamp by Messrs. Wilkins.

Three of Wilkins' patent lamps fitted at North Foreland.

Superintendent reports, and states consumption.

14th October.—Report from Mr. Faraday.

28th October.—Further in relation thereto.

1846, January.—Further reports from superintendent.

July.—Mr. Faraday adjusts smoke tube to the lamp.

August.—Order of House of Commons to know whether we have adopted recommendation of Select Committee, and what saving of expense has accrued.

(The return to this order was dated 26th January 1847.)

Member of Board suggests trial at Winterton; trial made there, and at Haisbro' and Caskets.

November.—The watch on board Cockle and Newarp lightvessels concur that Winterton is neither so bright nor so strong since the change.

Agent to make inquiry as to management.

The objection to this lamp consisted in the narrowness of the flame, owing to the form of the chimney, and the consequent limitation of divergence.

1847, January.—Mr. George Herbert, Trinity House. To introduce a lamp invented by him, suitable for burning rapeseed oil instead of sperm.

1847, January.—Referred to light committee, who think it should be investigated. Copy of proposal sent to Mr. Faraday with lamp.

March.—Report received from Mr. Faraday.

Further report from Mr. Faraday on same lamp, when fitted with a central deflector.

This lamp (without the deflector) was universally adopted at the catoptric stations in the course of the same year.

1848.—Mr. Herbert applied for remuneration; 200*l.* granted.

1849, January.—Mr. Herbert, for further allowance in consideration of great saving that has accrued.

February.—Declined.

1853, September.—Mr. Herbert renews application. Not complied with.

1846, January.—W. Nicholson, Universal Gaslight Company, Drury Lane.—To burn gas at the North Foreland or any other station. Will fit apparatus, find fire, fuel, and attendance, for 7*l.* per week.

1846, January.—Acquainted that we have no present intention of using gas in the Corporation's lighthouses.

1847, May.—W. R. Y. Motte. This gentleman appears to have been in semi-official correspondence with the secretary on the subject of a newly-invented light, but without ulterior result.

1847, August.—R. Rettie, C.E., Ham. Has invented a new light for lighthouses; requests to know whether Corporation will undertake trial at cost not exceeding 50*l.* to 80*l.*

1847, August.—Acquainted that Corporation decline to sanction expenditure in testing merits of an invention with the principles of which, and the mode of its application, they are entirely unacquainted.

1848, February.—Messrs. Brotherton. Submitting a patent oil.

1848, February.—Light committee to make trial. Found to be about equal to oil supplied by contractors.

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1850.—Messrs. Brotherton desire to tender. Informed that no particular form is needed.

1849, January to May.—Staité's Patent. Electric light. Semi-official correspondence with solicitor to Mr. Staité and to the Patent Electric Light Company, but without result.

1849, August.—Geo. Charlton, Almsperson, Deptford. To exhibit a light produced by a certain vegetable gas ignited in seal and other oils.

1849, August.—Acquainted that Corporation have no occasion for such an invention.

1850, April.—W. Fletcher, Lightkeeper, Burnham Lighthouse. Plan which he thinks will improve Argand lamp, and enable it to burn commoner oil.

1850, April.—Informed that it is not regarded as having anything of novelty in it to induce Board to incur expense.

1850, September.—W. W. Bonney, Fulham. A method of producing and sustaining for a longer period than hitherto a most powerful electric light for use in lighthouses; will prepare model, provided we defray expense, &c.

(Mr. Bonney's plan also included the illumination of buoys, for which see Buoyage and Beaconage Returns.)

1850, September.—Acquainted that Elder Brethren decline to accede to his proposition.

1851, February.—H. Vereker, Ballast Office, Dublin. That dock trustees, Liverpool, use patent burning oil refined from olive oil; that it is found good and reasonable, and inquiring if it has been used by this Board, and found to answer.

1851, February.—Informed that Board has not used the oil to which he adverts, and that olive oil has not been tried in the Corporation's lighthouses.

1852, May.—Mosselman, Borough. Sample of oil which he imports from France; requests permission to tender.

1852, June.—Informed that we have not any occasion for supply of that article.

1852, November.—Dr. J. G. W. Watson, Adelphi. An electric light generated by galvanic battery, and supplied at a cheap rate, on account of the residuum being valuable in the manufacture of colours.

1852, November.—Time to be fixed for viewing, in communication with Dr. Watson and Professor Faraday.

20th December.—Dr. Watson places himself in communication with Mr. Faraday. Mr. Faraday draws up memorandum, as to requirements and tests. Approved by Board. Dr. Watson to be asked if he concurs.

1853, January.—Dr. Watson concurs. Mr. Faraday arranges trial at Trinity House with great lamp of dioptric apparatus, lighted for purposes of comparison.

May.—Deputation from Electric Light and Colour Company received. Will be ready to submit light in about a month. Dr. Watson to communicate with Mr. Faraday, when ready, upon conditions agreed on.

June.—Experiments arranged for third week in July.

August.—Mr. Faraday's report thereon received; the best thanks of the Board returned to him for it.

Dr. Watson informed that essential qualities of simplicity of arrangement and steadiness of action are not sufficiently matured to render its adoption advisable at present time.

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1855, May.—Chairman of Electric Light and Colour Company advising that new lamp will be burning for a fortnight at their office. Thanks returned.

September.—Mr. Howe requests to be informed if Dr. Watson's electric is used by the Corporation.

Acquainted that it is not, being considered too complicated.

1854, March.—Board of Trade. Voltaic light:—For information to enable their Lordships to answer question in House of Commons, "Whether any experiments have been made with a view to ascertain whether the mode of producing the voltaic light, recently discovered by the Reverend Dr. Cullen, of Maynooth, can be made available in lighthouses during fogs and snow storms?"

1854, March.—Their Lordships informed that it has not in any manner been brought under our notice; experiments as to electric light, as adopted by another person, prove it not at present practically available.

1854, April.—Chevalier Hähner. An application of the electric light which shall be regularly intermittent.

1854, April.—Placed in communication with Professor Faraday. Not recommended for adoption.

1857, February.—Professor Holmes. Magneto-electric light for lighthouses; requests leave to submit patent process.

1857, February.—Leave granted.

March.—Exhibited at Blackwall, before Deputy Master and committee, with Professor Faraday.

April.—Professor Holmes requests leave to instruct keepers. Is requested to state cost and arrangement for application to lighthouses. The Professor's reply sent to Mr. Faraday, who makes observations thereon.

May.—An agreement made for a trial at South Foreland. Professor Holmes to erect instruments, and conduct trial for two months, for 400*l*.

1858, 8th December.—Commencement of experiments at South Foreland. French lighthouse authorities advised, and requested to favour us with observations from French coast. Three committees of Elder Brethren make observations on consecutive nights. Keepers at neighbouring lighthouses and lightvessels, and crews of pilot cutters, ordered to observe.

15th December.—Professor Holmes asked whether he would like to break off to perfect arrangement, and as to cost, &c.

30th December.—Temporarily discontinued.

1859, February.—Several panels of dioptric lens re-adjusted.

March.—Light resumed, with improved adjustment of lamp. Professor Holmes requests that inspection may be delayed a week.

7th April.—A committee of Elder Brethren observe.

20th April.—Deputy Master and committee, with Professor Faraday, observe.

26th April.—French lighthouse authorities visit.

29th April.—Professor Faraday's report. (Copy transmitted herewith.)

3rd May.—Report of Elder Brethren.

7th May.—Light discontinued, the two months having expired.

12th May.—Observations at Calais transmitted from French authorities, sent to Mr. Faraday, with those from English stations.

Payment made to Professor Holmes of the 400*l*. agreed on.

June.—Information required as to cost.

29th June.—Mr. Cutler, for Professor Holmes, in reply.

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July.—Arrangement made for further trial of six months' duration, upon payment of 350*l*., for use of complete apparatus. The management to be entirely in hands of Corporation's servants.

22nd August.—Exhibition resumed.

1858, April.—F. C. Cope, C.E., Frankfort. Calling attention to the illuminating power of a jet of steam thrown upon a strong light. (Addressed to Sir John Pakington, and sent to Trinity House by Board of Trade.)

1858, April.—Referred to Mr. Faraday.

May.—Report received from him to the effect that he is not aware of any principle or method by which steam can be applied with advantage to flame.

Copy sent to Board of Trade, with statement that Elder Brethren fully concur.

1858, June.—Major the Hon. W. E. Fitzmaurice. Oxyhydrogen light (a secret process); requests leave to submit.

1858, June.—Leave given to submit. Elder Brethren, with Mr. Faraday, witness an exhibition at Kensington Gore.

July.—Report from Mr. Faraday. Elder Brethren point out difficulties to Major Fitzmaurice, and propose that he should communicate in confidence with Mr. Faraday.

August.—Major Fitzmaurice agrees.

29th August.—Mr. Faraday's report in consequence.

30th August.—Major Fitzmaurice, stating that trial at Kensington Gore was private, and requesting comparative exhibition with usual light.

31st August.—Major Fitzmaurice proposes delay, on account of private business.

13th December.—Is ready for competitive trial.

21st December.—Letter sent to him pointing out the necessity of his proving it suitable for lighthouse purposes; use of experimental lantern at Blackwall offered to him.

1859, January.—Major Fitzmaurice is prepared for any trial Board may desire. Board order lantern at Blackwall to be placed at his disposal.

April.—Permission given to his agent to inspect lantern at Blackwall. Requests loan of reflector.

August.—Major Fitzmaurice is prepared for trial at Blackwall.

September.—Elder Brethren absent on official duty, trial postponed in consequence.

October.—Lantern at Blackwall placed at his disposal for purposes pointed out to him in December, 1858.

1858, December.—A. II. Renton, Adelphi. Oxyhydrogen light (Prosser's); requests leave to submit.

1858, December.—Leave given to submit. Submitted at Trinity House.

1859, January.—Mr. Renton is ready to exhibit at South Foreland, or elsewhere at his own cost.

Informed that Corporation is already under engagement to try two other systems, and that we regret we cannot at present accede to his request; Mr. Renton stating that he will be ready at any future time.

1859, June.—Professor J. T. Way, Welbeck Street. A new form of electric light, in which use of carbon electrodes is altogether dispensed with; steady, continuous, and uniform, capable of new adaptations for signalling, and less expensive than any other.

1859, 22d June.—Examination made by Deputy Master and Committee at Professor Way's residence. Subsequent inspection by Mr. Faraday.

27th June.—Report from Mr. Faraday.

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12th July.—Dr. Way requests opinion as to applicability for lighthouse purposes.

14th July.—Informed that the requirements of his light are not considered applicable to ordinary management at a lighthouse.

18th July.—Dr. Way requests to be informed of precise nature of objections.

21st July.—Is informed of the essential conditions, most of which, we consider, it does not in its present state fulfil.

Section.—Proposals relative to Lighting Apparatus, Glass, &c.

1845, April.—Professor Faraday. That, in reglazing the Eddystone, panes of glass by different manufacturers, properly marked, should be placed in the upper part of the lantern, in order that comparative qualities may be tested by time.

1845.—Suggestion concurred in, and carried into effect.

1845, September.—Captain Love, agent, Isle of Wight district. To line reflectors at Needles with red glass.

1845.—Sent to Mr. Faraday. Report from him. Suggestion not adopted.

1845, October.—Mr. Phelps, principal lightkeeper, Lundy. Model of improved lamp.

1845.—Mr. Wilkins directed to adapt improvement to one of his patent lamps. Twenty-five burners were afterwards fitted in the same way.

1846, October.—J. Smith, New Road. A "new reflecting apparatus, applicable to artificial light."

1846, October.—Committee appointed to call on him and inspect it. Find it to be a small triangular refracting apparatus. Report thereon. Light Committee of opinion that apparatus, in its present state, cannot be made available for the Corporation's service.

1847, February.—Alexr. Gordon, C.E., Fludyer Street. That, in the course of experiments, he has arrived at the certainty of being able to accomplish the following; viz. :—

- 1st. Illumination of buoys and beacons which shall not require attendance more than once in a month or six weeks.
- 2d. Illumination of floating lightvessels in a manner that the light shall be of equal brilliancy in the roughest as in the calmest weather.
- 3d. An entirely new and economical catadioptric arrangement of fixed, revolving, or flashing lights, and such as he would strongly recommend for the lower light at the South Foreland. The appearance from the sea would, in that instance, be similar to the appearance of the present lower light.
- 4th. The production and distribution of sound to indicate the proximity and position of light-houses, lightvessels, beacons, and buoys.

The third of these propositions appears to have been the only one considered at the time.

1847, February.—Read at Board; subject referred to Committee. Deputy Master to confer with Mr. Gordon. Corporation agree to pay for reflector and refractors on his principle, estimated by Messrs. Deville at "not less than 80*l*."

October.—Mr. Gordon reports apparatus nearly complete, and that it answers expectation in every respect. Requests that his partner may examine arrangements at Purfleet Experimental Lighthouse.

December.—Exhibition at Trinity House wit-

nessed by Elder Brethren. 84*l*. for apparatus ordered to be paid.

(A report from Mr. Faraday on this subject was subsequently transmitted to the Trinity House.)

1848, 29th August.—Mr. Gordon informed that trial of his apparatus, as compared with an ordinary Argand lamp and parabolic reflector, will take place at the Buoy Wharf, Blackwall, and be viewed from North Woolwich Station. Requested to pay previous visit to wharf, and inspect arrangements.

30th August.—Mr. Gordon visits wharf. Concludes, from angles marked on frame, that course of observations likely to be made originate in misconception. Will witness exhibition on 31st; but, owing to shortness of time, must delay remarks or suggestions.

31st August.—Experiments made. First Lord of Admiralty and Lord John Hay present.

2d September.—Mr. Gordon asked for remarks or suggestions. Further trial proposed for following Tuesday (5th).

5th September.—Renewed experiments.

6th September.—Mr. Gordon repudiates trials. Will specify what he considers fair, if Board will give him opportunity and means of carrying it out. Services and expenses should be considered, and time paid for.

13th September.—Board consider trials fair and judicious. Are quite ready to receive remarks, but decline to remunerate.

1849, 31st July.—Admiralty request loan of best ordinary reflector, and of Mr. Gordon's apparatus, in order to compare both with reflectors for Cape Pine Light, at Woolwich. Lent to Admiralty. Premises at Blackwall placed at disposal of their officers for observing experiments.

17th August.—Trial made at Woolwich Barracks, and viewed from Rainham.

7th September.—Letter from Mr. Gordon, with copy of letter addressed by him to Admiralty relative to observations made by Admiralty officers at Rainham, wherein he states that smoke from a chimney at Woolwich interfered with just comparison. Proposes to Trinity House to make another trial at Blackwall. Board decline to comply.

1847, March.—J. Napier, Edinburgh. Has a method for improving lighthouse machinery. Requests remittance of 20*l*. to enable him to get machine made.

1847, March.—Acquainted that Elder Brethren decline to comply with his request.

1848, May.—Admiral Owen, Captain Shortland, R.N., and Mr. Hutchinson. Machine invented by Mr. Hutchinson for producing in lighthouses the effect of a revolving light.

1848, May.—Attended and submitted it.

1849, February.—Professor Faraday. An apparatus to enable keepers at dioptric stations to adjust mirrors; and suggestion for lowering outside cases of burners to prevent light being intercepted from lower mirrors.

1849.—Approved. Ordered for Coquet, Hunstanton, Orford Low, South Foreland, Start, Braekwater, Lundy, Skerries, Bardsey, and Flatholm.

1851.—Messrs. Wilkins. Dioptric apparatus with a peculiar mode of producing short eclipses.

1851.—Inspected at Great Exhibition, but not taken. This apparatus was afterwards altered and fitted with additional vertical lenses, and offered to the Board for Lundy, but a holophotal arrangement made from a drawing obtained from France was adopted instead.

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1851, July.—Jas. Childs, Brentford. Calling attention to his newly-invented lamp at Great Exhibition.

1851, August.—Committee inspect it at Great Exhibition, and report principle to be the same as fountain lamp, but offer no opinion as to merits without an opportunity of comparison with ordinary lamps of same description.

(Mr. Childs had been in Mr. Wilkins' employ.)

1852, March.—Messrs. Wilkins. Improvement in central burner for dioptric lights, by dispensing with the central wick and introducing a perforated conical tube with a small breaker therein.

1852.—Experiments made, current of air found to be thrown with greater force into contact with the other wicks, and the brilliancy of the light increased; the consumption of oil being also rather greater. Adopted accordingly.

By Order of Board. To use glass of English manufacture in dioptric apparatus.

On the first introduction of the dioptric apparatus English glass, manufactured by Cookson, was used at several of the Corporation's lighthouses, and in 1840 the Board were engaged, with the assistance of Mr. Faraday, in an elaborate comparison of refracting apparatus of English and French manufacture. At that time the advantage was found to be greatly in favour of the French, which was consequently adopted, but subsequently to that period Messrs. Chance, of Birmingham, were in communication with the Board, who in 1852 lent them a French lens from the Trinity House for purposes of comparison; and in March,—

1853.—Mr. Faraday reported favourably on a specimen of Messrs. Chance's glass.

1854, February.—Messrs. Chance state that they have succeeded with a section. Permission given them to fix it at this house. Examined by Mr. Faraday, who reported it equal to the French apparatus in the experimental room.

May.—Messrs. Chance request order. Are promised the first.

1855, February.—Corporation lend Messrs. Chance a 6th order apparatus.

March.—Corporation decline to lend them a work in the library on American lights, but will give them every facility for making notes from it.

September.—Trinity House invite Messrs. Chance to tender for catadioptric apparatus for Bardsey.

October.—Mr. Faraday goes to Birmingham to inspect an apparatus of Messrs. Chance's, and reports thereon.

Messrs. Chance request copy of report. Refused, but Messrs. Chance informed that their glass is quite equal to the French.

December.—Messrs. Chance renew request for copy of report. Refused. Reminded that apparatus is not in practical operation.

1856, April.—Messrs. Chance's apparatus for Bardsey accepted. Tender invited from them for a peculiar arrangement for Lundy, which Board propose should be French. Messrs. Chance state that they can undertake its manufacture.

Board determine that competition may include English glass.

May.—Messrs. Chance's tender for it accepted.

November.—Bardsey apparatus fitted.

1857, June.—Lundy apparatus tried at Blackwall. Substance of Professor Faraday's Report sent to Messrs. Chance.

July.—Lundy apparatus fitted at station. Messrs. Chance have since constructed the apparatus for the Whitby, Cami Rocks, and Vancouver's Island lighthouses, and are always invited to compete when lighthouse apparatus is required.

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1855, January.—Messrs. Wilkins. Plan for arrangement of lamps and reflectors for flashing light. 1855.—Tried at Blackwall.

1855, April.—Richard Clark, Metropolitan Light Company, West Strand. Improvements in lights for lighthouses, patent burner, &c.; requests permission to exhibit.

1855, April.—Board depute an Elder Brother to inquire.

24th April.—Arrangements made for exhibition.

15th May.—Mr. Clark is prepared to exhibit certain burners.

22d May.—Mr. Clark sends observations on dioptric lights.

To lie on table.

29th May.—Mr. Clark sends burners.

12th June.—Trial made against concentric wick burner; considered unsuccessful. Mr. Clark obtains leave for further trial after certain alterations.

July.—Further trial, unsuccessful as on first occasion:

Admits this by implication in letter of 10th August. Prays payment of outlay. Allowed 66*l.* 6*s.* 8*d.* for burners supplied.

September.—Mr. Clark borrows one of these burners.

December.—Is requested to return it.

1856, April.—Calls attention to his patent to supersede dioptric lenses, and use silvered sphere or column instead. Complains of infringement by Messrs. Wilkins.

May.—Further as to use of silvered sphere with lamp and parabolic reflector to illuminate it, and proposing to produce parabolic reflector of four feet diameter.

Is requested to return lamp lent in 1855.

June.—Asks leave to retain it longer. Is reminded of the time he has had it, and that we expect return within a month.

1856, December, and 1857, April.—Return of lamp again requested, and proceedings threatened.

1858, April.—Mr. Clark submits his projects to Board of Trade, complains that he could not get them investigated by Trinity House.

Précis of the whole matter furnished to Board of Trade.

(The lamp above referred to has not yet been returned.)

1857, October.—By order of the Board. Experiments to test relative power and efficiency of different systems of illumination.

1857, 13th and 20th October and 10th November.—Experiments made at the Buoy Wharf, Blackwall, and observed by Deputy Master, Committee, and Professor Faraday (with Admiral FitzRoy on one occasion), from Warley once and from Hornchurch twice.

The arrangement, which revolved at various rates of speed in the course of the experiments, was as follows, viz. :—

- 1st. Seven lamps and parabolic reflectors on one face, occupying one fourth of the circle.
- 2d. A great annular lense lighted by a Fresnel lamp, occupying a second fourth of the circle.
- 3d. Two sets of three reflectors each arranged as at Buchanness, occupying a third fourth of the circle.
- 4th. Four lenses forming a part of the apparatus originally intended for the Bishop Rock light (but ultimately fixed at Godrevy). Each lens 9 inches wide but 50½ inches high, and each accompanied by refracting reflectors above and below, 24 to the circle, occupying the remaining fourth of the circle.

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Reports were made by the Committee and by Professor Faraday to the effect that the seven reflectors have pre-eminence and are superior to the great lens; the lesser arrangement, known as the Bishop, being slightly superior to the reflectors arranged on the plan of the Buchanness.

1858, May.—By order of Board. Professor Faraday consulted as to his knowledge of any recent improvement in the exhibition of lights coloured red.

1858, May.—Professor Faraday is not aware of any fresh arrangement. The Director-in-Chief of French lighthouses addressed relative to red light on the Malakoff lighthouse at the entrance of the Bordeaux River. M. Reynaud furnishes information in reply.

1858, June.—Board of Trade. Memorial from Mr. B. Monieriff, Liverpool, for improvements in lighthouses, that they should be provided with a mechanism by means of which their light may be kept in constant reciprocate motion in a straight vertical line, the whole length of which is to be shown to the mariner.

1858, June.—Board of Trade acquainted that information supplied is insufficient to enable us to form an opinion.

1859, May.—Professor Faraday. That metal framework of the dioptric apparatus is thicker than need be.

1859, May.—Mr. Wilkins consulted thereon, and reduction in thickness agreed to.

1859.—Messrs. Chance. Suggest increased number of upper and lower prisms in second order heliophotal apparatus.

1859.—Referred to Mr. Faraday, and ultimately adopted for a light in Ceylon.

1859.—Messrs. Wilkins. A 36-inch reflector, 14 inches in depth, 6 inches focal distance, which has been tried against smaller reflectors, and appears to be as powerful as a first-class revolving dioptric apparatus.

1859. Acquainted that we have no objection to try the effect on the first suitable occasion.

1859, May.—Mr. Jones, principal keeper, Maplin. To lower the support or bearer of the central breaker in the dioptric lamp, and thereby remove obstruction to the draught further from the light.

1859.—Referred to Messrs. Wilkins, who see no reason why it should not be done. Committee approve suggestion, and order that it be carried out as burners are forwarded for repair.

1859, August.—Board of Trade. Calling attention to proposal of Mr. Alexander Gordon for use of moulded glass for lighthouse purposes, as invented by M. Degrand, Engineer to the French Lighthouse Board.

1859, August.—Consideration deferred pending examination by a Committee of Elder Brethren, with Professor Faraday, of the lighthouse at Point de Walde, Calais, which is fitted with this glass. This examination has since taken place, and the Board are in correspondence with the French authorities on the subject. Sections have been sent from France, and are in course of examination.

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1859, October.—Messrs. Wilkins. For leave to submit an improved method of polishing reflectors by machinery.

1859.—Leave given.

1859.—By order of the Board. Experiments to test the relative merits of various methods for promoting combustion of oil in a central dioptric lamp.

1859.—Experiments have been made at the Trinity House before the Elder Brethren and Mr. Faraday, which have resulted in the selection of a plan by Mr. Wilkins, by which the oil is raised by pressure applied to the surface of it, and so made to overflow the burner much more copiously than at present.

Lamps of this pattern have been ordered for Dungeness and Smalls lighthouses, in which the fourth wick has also been resumed.

Section.—Proposals for Distinguishing Lights.

1847, February.—Rear-Admiral Ward (through Admiralty). "That the lights on the principal and prominent headlands should be revolving, a portion of which should exhibit a coloured light, say, about three minutes of the most brilliant white; then, two minutes of coloured instead of total darkness, or three minutes of white preceded by half a minute coloured, and followed by the same; then, one minute dark."

Selly, Seven Stones; as they are, being very good.

Longships; red.

Lizard; green.

Eddystone; a red shade revolving every five minutes within the circle of the glass. The whole of the lights, with the above exception, to be revolving, either with three minutes of bright white light, and then two of coloured, and no dark, or one minute dark, then half a minute coloured, then three minutes white, half a minute coloured again, and then dark.

Start; blue.

Casquets; yellow, or as they are.

Portland; red.

Needles; green.

St. Catherine's; as it is.

Beachy Head; blue.

Dungeness; red.

South Foreland; green.

North Foreland; blue.

1847, February.—Admiralty informed that we entirely concur with Admiral Beaufort, "that the means proposed would lead to inextricable confusion."

1847, April.—John Ridley, North Shields. To show a different coloured light at a certain point of the compass when ships come within the limits of danger.

1847, April.—Read, and to be acknowledged.

1848, February.—"J. S.," Hull. To prevent ships mistaking one light for another as well as to effect a great saving in the expense, by rendering unnecessary revolving lights altogether.

Suppose, for instance, all the lights on the coast of—

Essex are white;

Suffolk, blue;

Norfolk, red;

Lincolnshire, green;

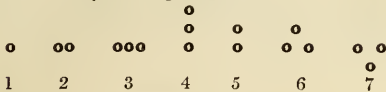
Yorkshire, again, white;

and so on round the kingdom. Or two counties might be joined in one colour, but keeping always the above rotation; or, perhaps, better only three colours.

Again, supposing each light on each respective coast, besides its name, was numbered 1 upwards,

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these numbers might be represented in their respective colours by three lights, thus—



In the Irish channels and coasts on both sides the colours should correspond on the same parallels, for sake of better remembering vicinity, and for uniformity.

Liverpool, red; Dundrum Bay, red;
Isle of Man, white.

All the lights might be fixed, and never out of sight when once seen, as revolving lights are.

1848, February.—Read.

1848, February.—J. Penrice. A method by which he proposes to distinguish lighthouses.

1848, February.—Attended and exhibited a working model.

May.—George Wells. A telegraphic lighthouse (as per plan herewith).

May.—Attended, and submitted model. Board offer him a trial at Purfleet.

Mr. Wells proposes that he should not be at any expense.

June.—Board cannot accede, but desire to offer him every facility.

July.—Mr. Wells, that he is preparing for trial.

Informed that Board will appoint time if he will indicate place, and that Elder Brethren will attend.

No further proceedings.

December.—T. Aston (Madras Cavalry), Bedford Row. Plan for adding distinguishing or proof lights to the present lighthouses (as per plan herewith).

Copy transmitted by Admiralty.

December.—Acquainted that Corporation are not disposed to encourage him to proceed further, but are willing, if he wishes, to inspect models illustrative of practical effects.

Admiralty informed of reply to Mr. Aston.

1849, December.—E. Plumley, Battersea. That the space during which a light is visible shall represent a certain numeral, and that the number so represented shall be precisely the number of minutes during which the light is visible.

Mr. Plumley then suggests modifications of this principle by regarding the observations of the light as representative also, and by the employment of red light; and submits tables showing the means of representing any of the nine numerals or the cypher, as required. Thinks that seconds might be used instead of minutes; that red light is objectionable, on account of absorption. Suggests process of the Company for illuminating glass to increase luminosity and power of lenses; and finally with regard to flashing lights, proposes to give to each figure its number of flashes or scintillations as rapidly as they can be counted, with intervals of darkness of sufficient length between each figure and at the conclusion.

Thus the number 225 would require two flashes for the first two, then an interval of darkness, say half a minute; then two more flashes and a like interval; and then five flashes and a double interval, say of one minute.

1849, December.—Informed that his proposal is not regarded as adapted for practical purposes.

1851, January.—J. Davey, Devonport. That the lanterns should be hexagonal, and on each side a number, the whole height of the lantern, painted in black upon the glass.

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1851, January.—Acknowledged.

1852, May.—Mr. Davey enlarges on the same idea.

1852, May.—Laid before the Board. Informed that the ideas are not in any manner novel.

1851, July.—R. Smith, Chelsea. That present lighthouses be furnished with a small steam boiler and the ordinary whistle to be fixed thereinto. Each lighthouse to be furnished with a certain number of signal whistles in rotation, according to the station. The boiler to be fitted with a crank and barrel similar to an organ, and with the aid of the steam to be made self-acting. The turning of the barrel to open a valve and admit the steam into the several pipes in rotation, the sound to be confined to each whistle for ten seconds; and each pipe or whistle to have a distinct sound, so that the given number of each may be counted, when the sound will cease for half a minute. By such rule any person may know the name or situation of the lighthouse.

A copy sent from Admiralty.

1851, July.—Attended and explained.

Admiralty informed that Mr. Smith had attended.

1851, September.—Joseph Joplin, St. John's Wood. That the roof of a lighthouse should be a form composed of a cone and a spherical dome, intersected scientifically. The conical and spherical parts of the roof, as well as a portion of the cylindrical shaft on which they rest, may be glazed with different colours, or one may have white glass. In this way a series of distinctly different appearances for lighthouses may be given, each having the peculiarity of indicating north, south, east and west, and their intermediate parts.

If the south side exhibit most of the conical form, a part of the sphere will be seen over it, and the north side would present the greatest portion of the spherical part, with a wing of the cone on each side at the bottom. Approaching on the east side the cone would appear to the left, presenting about an equality of surface to that of the sphere on the right. On the west side these parts would appear reversed; viz., the cone to the right, and the sphere to the left.

Offers to attend appointment.

1851, September.—Thanked for communication. Informed that it will not be necessary to trouble him to attend.

1851, November.—C. Babbage, F.R.S., Dorset Square. To make each lighthouse repeat its own number during the whole time it is lighted, by occultation and reappearance of light.

Upper part of cylinder to be enclosed by thin tube of metal, and to be made to descend slowly before flame, and allowed to start suddenly back.

Lighthouses not to be numbered in order of position, but so that no digit occurring in the number denoting the several lighthouses nearest it on either side shall have the same digit in the same place of figures, so that two out of any three figures would always detect any error in observing the third.

These occultations would distinguish lighthouses from casual lights. Whole illuminating power would be employed undiminished by use of coloured glass, &c.

Lighthouses might thus be made telegraphic with vessels in distress, and system might be developed to the extent of making the identification of a light instantaneous by peculiarities in the character of the occultation.

(Private pamphlet, "Notes respecting Lighthouses.")—See Suggestions for Lighting Buoys under proper head.

These suggestions were not adopted.

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1857, September.—Captain Hall, H.M.S. "Calcutta," transmitted through Board of Trade. That at certain hours particular lighthouses in the Channel should throw up blue rockets.

Board of Trade acquainted that, in opinion of Elder Brethren, cases of mistake between ships' lights and those from lighthouses or vessels must be of exceedingly rare occurrence, and that plan proposed would be inefficient, inasmuch as coloured rockets would not generally be seen so far as the light itself.

1859, May.—C. D. Bouton, Dinan. Whether jets could not be so fixed on the globes of lighthouses, and so placed as to form, if not the whole name, the first four letters of the name of the lighthouse; as, for instance, the Caskets and the Scilly—*Cask—Scil*, which, by aid of strong reflectors could be seen at such a distance as to avoid any danger to ships or vessels.

1859, May.—Receipt acknowledged.

Section.—Proposals relative to Lighthouses, or their Foundations, on the Goodwin or other Sands.

1845, March.—Sir Samuel Brown, Hanover Street. To place bronze columnar lighthouse, with parabolic foot and base filled with concrete, on Goodwin, or elsewhere, in six or seven fathoms water, for 11,000*l.*, and guarantee it for a year.

Acquainted that experience of Elder Brethren indisposes them to entertain project for erecting lighthouse whose base rests upon surface of sand. Will consider any plan he may submit for lighthouse at Rundlestone, Rocks off Scilly, or Shoal of the Lead.

1845, October.—Rev. F. A. Glover, Dover.—A plan for foundations for lighthouses on sand or rock in any depth of water.

(Mr. Glover also submitted a plan for Island Breakwaters in 1850.)

1845, October.—Attended with model.

November.—Mr. Glover submitted observations in reply to remarks of Brethren. Receipt acknowledged.

1846, March.—J. De La Haye, Liverpool.—Lighthouse on Goodwin. Six wrought-iron shafts or pillars in the sand, each placed in an iron cylinder to sink them by atmospheric pressure, to be bound together with hoops or rings, and form a circular skeleton tower, through which the waves could pass, &c.

1846, March.—Informed that principle of atmospheric pressure is not new.

Mr. De la Haye replies, that his point is the skeleton lighthouse, to admit of waves passing through.

Informed, in reply, that the method of construction by open piles has been applied in the case of the Smalls, built in 1788, and in subsequent erections at Maplin, Fleetwood, River Dee, and Belfast.

1847, August.—C. Wise, Westminster. Iron base for Goodwin Sands and anchors, including one for mooring floating lighthouse.

Acquainted that plans have been laid before the Board.

1847, October.—Bolton Bolton, Pimlico. To build a lighthouse on the Goodwin Sands for 82,000*l.*, or to convert them into a harbour of refuge.

Acquainted that Corporation has not any present intention of attempting to erect a lighthouse on these Sands; and that construction of harbours of refuge does not come within the province of this Corporation.

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1847, November.—W. N. Clay, Ongar. Adverting to former proposal for foundation of lighthouse on the Goodwin. Thinks Sands may be recovered.

Acquainted that Corporation has no present intention, &c.; and that "recovery" of the Sands is not within its province.

1847, November.—G. Shepherd, C.E., Fleet Street. Sends copy of "Mining Journal," containing an article respecting construction of lighthouses on dangerous sands.

Suggests the principle upon which quicksands are dealt with in mines; and to sink a cylinder, 30 feet in diameter, hermetically sealed, and forced down to the chalk by Dr. Potts' atmospheric apparatus. Sand and chalk to be afterwards taken from interior, and piles driven, and concrete used. Outer circle of protecting piles, concrete, &c.

1847, November.—Thanks returned for communication.

1848, February.—Attends with drawings and explanations.

Subsequently informed that Elder Brethren have not any intention to attempt to construct a lighthouse on the Goodwin Sands.

1848, January.—J. De La Haye, Liverpool. Lighthouse on Goodwin. A wrought-iron cylinder to be sunk 30 feet, 200 feet diameter, in 12 distinct pieces, with flanges for quickly bolting together; divided into 12 compartments, by partitions extending only half the depth; to be sunk by patent steam hammer, or pneumatic process; to be covered with timber, and iron platform. Lighthouse of sheet iron, with inside masonry. Iron bars from a ring round the tower, at 50 feet from base, to extend to edge of platform, to be covered with sheet iron, and form a heavy gradient for waves to roll up before reaching tower. Interior of this part to be nearly filled with stones.

Immense weight of structure to compress sand, and keep it steady.

1848, January.—Informed that Corporation has not any present intention to erect any structure on the Goodwin.

1848, February.—W. Vincent, Birmingham. Lighthouse on Goodwin or other sands. Open piles, hollow at lower end, and loaded with iron ballast, spreading out from a centre, with barbs at the bottom, to prevent sinking too far, and to act as stays. Chains to be wound spirally round piles, &c.

1848, 16th February.—Acquainted that this Corporation has no present intention of attempting to erect a lighthouse on the Goodwin Sands, but that if he desires to send plans there is no objection.

23d February.—Mr. Vincent sends plans.

4th March.—Informed they have been laid before Board.

27th March.—Mr. Vincent inquires as to decision.

30th March.—Referred to first communication, Board's views remaining unaltered.

November.—Solicits employment under Corporation. Informed that Board have no occasion for his services.

1849, August.—Adverts to plans, prays pecuniary assistance. Informed that funds of Corporation are not applicable to his relief.

1850.—Mr. Vincent again urges adoption of plan.

December.—Informed that his view as to utility of lighthouse is altogether at variance with that of Board, &c.

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1848, February.—D. McGill and J. Horend. Permanent breakwater at Goodwin, with lighthouse thereon; with basis 600 feet square, and proposing a toll of one penny per ton on all shipping, and graduated scale of charge for master, officers, and crew.

Acquainted that construction of breakwater is not within province of Corporation.

1853, February.—J. W. Horend. Renewing proposal, with modifications. Estimate 580,000*l.*, or, on a lesser scale, for 68,000*l.*

1848, February.—G. C. Redman, City of London Club. Fort on the Goodwin, with lighthouse attached; has submitted it to the Duke of Wellington, who refers him to Corporation as regards the lighthouse; requests report to his Grace.

May.—Acquainted that construction of forts not being within province of Corporation, Elder Brethren decline to put themselves in communication with his Grace thereon.

1848, June.—J. Goldfinch, Shepherd Market, May Fair. Lighthouse on Goodwin, with refuge and sailors' chapel. To be made of cast and wrought iron, and fixed on wooden piles.

June.—Acquainted that Elder Brethren have not any present intention of attempting to erect a lighthouse on these sands; are obliged by opportunity afforded them of inspecting plans.

1848, September and December.—Reverend J. B. Robinson. Inquiring as to possibility of erecting structure on the Goodwin, and calling attention to new material for use in sub-marine foundations.

Informed of existing arrangements at Goodwin, and that Corporation have no present intention of attempting to erect any additional mark.

1849, May.—E. Evans, Dorking. Lighthouse on Goodwin, desires to submit plans.

Acquainted that this Corporation has not any present intention of erecting a lighthouse on the Goodwin Sands.

1849, June.—H. Harbord. Plan and model for erecting a lighthouse on Goodwin. A circular iron plate, 60 feet diameter, to be placed at the bottom, and one, 30 feet diameter, some height above it; to be connected by eight iron pillars, 50 feet long; to be planked 2 feet up from the bottom, and hold 200 tons of clay and stone; the rest of the structure open to egress of wind and wave. To be floated out and sunk and moored with anchors. Circular lightvessel on top of it.

1851, June.—H. Harbord. Advertises above; proposes now to force a rod, 1½ inch diameter, through sand into chalk sufficient to hold it, with screw joints to lengthen it; then round it, at proper distance, stones to be thrown overboard, and come up in form of cone.

Acquainted that Corporation has not any intention to attempt the construction of a lighthouse on the Goodwin.

1849, June.—W. King, 8, Woodstock Street, Oxford Street. For leave to submit plan for Goodwin.

Acquainted, that Corporation has not any intention to erect lighthouse on the Goodwin, but that we will inspect model if he continues to desire it.

1849, July.—M. Duval Piron, Paris. Lighthouse

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on Goodwin. Iron well of 27 feet diameter formed of vertical bends, double skin, to be sunk through sand to solid bottom; sand to be dredged out, concrete filled in. Platform to be raised above top of well, by hollow iron pillars filled with concrete; column to be of sheet iron cylinders. Light 98 feet above low-water mark, cost 7,000*l.*

Thanks returned. M. Piron acquainted that Corporation has no present intention to attempt erection of lighthouse on the Goodwin.

1850, February.—J. E. Serrall, New York. Lighthouse on Goodwin. A crate, 150 feet diameter, of copper or iron rods braced with diagonals, and with inner circles 15 feet apart; in the centre a tube 15 feet in diameter. Crate to be filled in with rubble, except the shaft, and fresh crates added as the others sink; solid bottom to be ultimately reached, perhaps at 110 feet.

Lighthouse above with three lights vertical, upper lantern 150 feet; estimate, 100,000*l.*

Thanks returned. Mr. Serrall acquainted, that this Corporation has not any intention of erecting a lighthouse on those sands.

1850, February.—B. Armstrong, Poplar. Lighthouse on Goodwin; to be built in place of safety, floated to station, pressed down by atmospheric pressure, and forming water-tight caisson filled with concrete, &c. Foundation assumed at 70 feet; inner part half of perfect sphere 100 feet in diameter, outer part 120 feet diameter, divided into eight water-tight compartments; lighthouse to be placed on top of outer sphere. Steam engine on top of inner sphere to exhaust air, pump sand out, &c.

Acquainted that Corporation has not any intention to erect a lighthouse on those sands.

1850, March.—Alex. Roberts, C. E., Clerkenwell. Lighthouse, for placing on rock, sand, or gravel bottom, without any previous substructure or foundation, and could be erected in a week. Main shaft of iron, lower end fitted into cast-iron plate. Into the upper end is keyed a wrought-iron shaft, to receive platform, &c. Standard supported by mooring it to crabs or struts, with means of adjusting shaft in perpendicular line. Outer crab connected with inner by lever, and outer mooring chain acting on end of that lever.

Estimate, 1000*l.* to 1500*l.*, and upwards.

Attended and submitted.

1850, December.—G. Grazebrook, Liverpool. Has a plan for the Goodwin. Cost of building will be less than for ordinary kind of lighthouse; proposes that it should be built at Corporation's expense, and, if found to answer after a year's trial, that he should be paid 100,000*l.* for his invention.

1850, 11th December.—Acquainted that Elder Brethren decline to accede to his proposition, and that Board has not any intention of erecting a lighthouse on the Goodwin.

12th December.—Mr. Grazebrook replies, urging importance.

18th December.—Informed that Board differ with him as to utility of lighthouse on Goodwin, and that although his plan should appear feasible would decline to adopt it.

21st December.—Mr. Grazebrook thinks it so important, that he will communicate plan without prospect of reward if we will proceed with it, should it be considered practicable.

1851, 2d January.—Informed that sands have been marked by light vessels, which we consider better guides.

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6th January.—Mr. Grazebrook will be glad to be informed if we change views.

1851, May.—S. Borrass, Liverpool. Iron lighthouse on Goodwin (or other sands, or in deep or shallow water. Requests leave to submit plan.

Acquainted that Corporation has not any intention to attempt the erection of a lighthouse on the Goodwin.

1851, June.—S. Borrass, Liverpool. Further as to plan; can submerge lower part of building in 40 fathoms water, or in shallow water. Iron to be used as coffer dam, and stone building inside.

Acknowledged, and acquainted that letter has been laid before Board.

October.—T. E. Smith, Hackney. To establish lighthouses on or through shifting sands, by first sinking an iron tube through the sand to the rock beneath, large enough to allow a man to pass for the purpose of excavating; the standards to be passed through the tube and soldered into the rock, and the tube to be withdrawn by lighters, &c.

Offers to attend and explain further.

Acquainted that attendance to explain plans will not be required.

1852, January.—Earl of Darnley, Belgrave Street. Foundations for lighthouses on Goodwin, &c., by combining melted bitumen from Trinidad with sand and gravel, and pouring it on sand banks or shoals to constitute foundations. Drawing shows cone with extended base and surrounding sand conglomerated with petroleum to form submerged rampart.

Thanks returned.

1852, February.—G. Sinclair, Parthenon Club. Lighthouse on Goodwin. Foundations on principle of Plymouth Breakwater.

1853, November.—Renewing proposal.

Copy received from His Royal Highness the Master and one from Treasury.

Thanks returned. Acquainted that Elder Brethren have not any intention to erect a lighthouse on the Goodwin.

1852, July.—C. James, Marylebone. Lighthouse on Goodwin by sinking a shaft in the nearest suitable part of the adjacent shore, and building a tunnel for permanent passage of communication, and thence working upwards.

Acquainted that this Corporation has not any intention to erect a lighthouse on the Goodwin Sands.

1852, September.—B. G. Martin, Maidstone. For permission to submit model for laying down foundations on or off Goodwin or any other sands.

September.—Acquainted that he may attend any Tuesday that may suit his convenience. Attends and submits model. Requests opinion thereon.

October.—Informed that it is not the practice of the Corporation to offer any opinion on models submitted for their inspection.

1852, September.—W. Darley, Sheerness. Inquiring as to most dangerous points on coast.

October.—Proposing to build lighthouses, &c. at Goodwin and Nore.

Acquainted that Elder Brethren have not any intention to erect lighthouses on Goodwin or Nore.

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1853, November.—J. S. Morris, Upper Thames Street. Lighthouse applicable for situations and foundations similar to Goodwin.

Acquainted he might attend.

Attended and submitted.

1854, May.—J. F. Stanford. To know if we will sanction a seamount on the Goodwin, and how far we will assist and grant privileges.

Acquainted this Corporation has not any intention to erect a lighthouse or other mark upon the Goodwin, and that Elder Brethren must decline giving encouragement to any private enterprise having that object.

1856, January.—John Neale, Chatham. To substitute large iron vessels filled with concrete, after being floated to positions for foundations of lighthouses, instead of present slow process of masonry.

To lie on table for consideration.

1856, August.—W. E. Hall, Middleton Square. Offers to submit model for lighthouse on Goodwin.

Thanked; declined.

1856, October.—Ralph Stennell, of Lynn. Desires to submit new principle which would secure solid foundation for light on Goodwin.

Acquainted that Corporation do not purpose making any further experiments for the erection of a lighthouse on these sands.

1857.—A. Chard, C.E., Brixton. Lighthouse on Goodwin Sands. Cylinder of sheet iron 100 feet diameter, 50 feet high. Outside this another expanding cylinder of same diameter at base, but 150 feet diameter at top. Thus a water-tight wedge-like space 25 feet in width at the top would be left, the base forming a circular wedge to work its way through sand to a solid bed; to be floated out and sunk with chalk in outer circle, then angular blocks of Portland stone in interior until basis like breakwater at Plymouth is obtained, &c.

1857, January.—Acquainted that Elder Brethren have no present intention of attempting erection of lighthouse on Goodwin, but are ready to give best consideration to any plan he may desire to submit.

February.—Thanks expressed for explanatory statement.

Mr. Chard inquires as to approval. Referred to previous letter. Acquainted that Elder Brethren are not prepared to give sanction to any scheme for erecting a lighthouse on the Goodwin.

1857, February.—W. S. Ashby, Chelsea. Has a plan for a lighthouse on the Goodwin.

Acquainted that this Corporation has no intention of attempting the erection of a lighthouse on these sands.

1857, May.—W. Austin, C.E., Wandsworth. Imperishable stone blocks for lighthouses, and cast iron annular ring double-fanged and trough-sunked to receive dove-tailed stone blocks, to form footing for lighthouses on soft ocean beds.

Ordered that Mr. Walker be asked about invention.

No further proceedings.

1857, December.—T. K. Winder, Admiralty Pier Works, Dover. For leave to submit plan for erection on Goodwin.

Ordered to lie on table.

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1858, April.—Lieut. E. Manico, R.N., Bucklersbury. To obtain foundations by means of his patent caisson de fer.

(As per plan herewith.)

Acquainted that it has been laid before the Board.

Messrs. Mitchell's method of obtaining foundations in sands by the use of screw piles had been adopted by the Corporation for some years prior to 1845. The Maplin lighthouse was built on this principle in 1842. The Chapman in 1851, and the Gunfleet in 1856.

Section.—Proposals relative to Lightvessels, &c.

1846, November.—Hon. and Rev. A. Percival. To transfer semaphores used on shore to hulls stationed at proper distances, and secured by mushroom anchors and chain cables, and furnished with lights, gongs, &c.

Acquainted that the experience of the Elder Brethren does not permit them to give any encouragement to the prosecution of his plan.

1850, October.—Further as to same subject.

1847, February.—Alex. Gordon, C.E., Fludyer Street. Illumination of floating lightvessels in a manner that the light shall be of equal brilliancy in the roughest or in the calmest weather.

Not specially considered; submitted with other propositions, for which see section Lighting Apparatus, p. 38.

1848, September.—Robt. Banner. A harbour of refuge on Goodwin by floating breakwaters, with one or more advanced lights.

Acquainted that construction of harbours is not within the province of this Corporation.

Mr. Banner replies.

Corporation decline to enter into subject for reasons above stated.

1850.—By order of Board. To use dioptric apparatus in lightvessels.

1850, November.—Drawing from French maker (M. Lepaute) obtained by Mr. Wilkins.

Experiment made with spare lightvessel near the Chapman.

Report of Committee not favourable.

Board order further trial under another arrangement.

1851.—Small apparatus from Mucking fixed at Tongue light.

1856.—Small apparatus fixed at St. Nicholas.

1850, March.—R. Grieve and others, masters of vessels. That in the event of a lightvessel breaking adrift, the lights may be kept burning and a night signal adopted.

The 16th Article of the Instructions to Masters and Mates reconsidered, and "Additional Instructions," giving discretionary power, issued 6th January, 1852.

1852, July.—Rear Admiral Taylor. A shipwreck asylum on the Goodwin.

Transmitted by Admiralty.

Admiral Taylor informed that, appreciating his motives of humanity, the Elder Brethren will not object, provided there is nothing to mislead or obstruct navigation.

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1852, September.—James Hall, Trinity House, Surveyor of Shipping. Presents two models of lightvessels, one a full the other a sharp bowed vessel, and forwards testimonials from master mariners of the superiority of sharp over full-bowed vessels for riding in all kinds of weather.

1852, September.—Thanks returned. Light Committee to consider subject whenever new lightvessels are required.

1853, December.—George Herbert, Trinity House. Circular lightvessels on principle of hollow bottom and central mooring, as previously applied to buoys; accompanied by a paper furnishing "reasons for considering that the form of a ship is not the best form for a stationary floating body, and for supposing that a circular vessel moored from its centre of gravity is a much superior form for that purpose."

1853, December.—Referred to Committee.

1854, March.—Letter from Mr. Herbert with plans and estimate of cost.

Board of opinion that principle should have encouraging attention.

Mr. Samuda who prepared plans to attend the Board.

April.—Mr. Samuda attended and expressed very favourable opinion of the plan.

Reference to Joint Committee to consider what steps to take to ascertain whether the properties of the invention are practically applicable to the floatation of a large circular body, as they have already been proved to be to that of buoys.

June.—Large beacon ordered.

October.—Large beacon placed at South Sand Head, answered in a satisfactory manner whilst afloat, but foundered in November, owing, as it is supposed, to some defect of construction.

1855, January.—Sir Charles Fox. Design for floating wrought-iron lighthouse on foregoing principle.

1855, January.—Sir C. Fox informed that having regard to present difficulty of directing the movement of such a body to a place of safety in event of casualty, and to the plan not having undergone sufficient test in forms of lesser magnitude, we cannot at present sanction.

June.—Sir Charles requests return of design, and reiterates faith in soundness of principle.

Design returned.

1855, September.—Board of Trade. Forward letter with resolution from Shipowners' Association, Liverpool, in favour of light in fairway of St. George's Channel on same principle.

1855, October.—Letter in reply, that Elder Brethren do not see necessity, and pointing out dangers both to the trade and to the crew of the vessel if it broke from moorings, &c.

1856, April.—Board of Trade. Adverting to proposal to light Blackwater Bank, and inquiring as to suitability of floating light of Mr. Herbert's construction at that station.

1856, April.—Reply, not prepared to recommend lightvessel on Mr. Herbert's principle in so exposed a situation.

1856, May.—Mr. Renton, Adelphi. Proposal and plan for floating light tower on Herbert's principle in Prince's Channel.

1856, May.—Reply, not prepared to adopt it on this occasion.

December.—Mr. Renton, Adelphi. Proposal for one to seaward of the "Stones," St. Ives, asserts it to be no more unmanageable than a lightvessel, and more easily brought up when adrift, &c.

December.—Reply, not prepared to adopt it for this purpose.

1857, January.—Board. To Mr. Renton that recent destruction of beacon on Rundlestone affords opportunity of again testing principle of Herbert's

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Patent, will do so upon condition that sufficient guarantee be given, securing Corporation from all liability in event of failure, for two years.

1857, January.—Mr. Renton requests to be informed, before submitting proposal, of the spot in which it is to be moored; encloses letter from Captain Williams, of the Admiralty Survey, relative thereto.

February.—Board reply that spot suggested by Captain Williams will be adopted, provided beacon be moored not more than two cables' length from the rock.

March.—Mr. Renton, that he will provide and deliver a beacon 20 feet diameter, showing 27 feet above the waterline, with a 6 cwt. fog bell, rung by floats, for 1,600*l.*, or, with a guarantee, for one year 2,150*l.*, or for two years 2,850*l.* Moorings additional, and, according to character, either 35*l.* or 62*l.*

Amends this proposition (upon explanation in regard to payments which he misunderstood to be withheld during time of guarantee) into offer to place and maintain for twelve months for 2,085*l.*

April.—Board rejoice that they are willing to test the efficiency of this description of beacon if Mr. Renton is ready to comply with following additional stipulations; viz., a guarantee for two years, and, if adrift during first year, repayment to Corporation of 2,000*l.*; if adrift in second year, repayment of 1,500*l.*; beacon, in each case, to become property of contractor; that if Corporation desire renewed trial, all expenses of repair, &c. to be borne by contractor, and the two years to date from time of re-mooring.

15th April.—Mr. Renton declines to accede: thinks principle has been successfully established in buoys, and that the unusual character of the guarantee compels him reluctantly to decline offer.

22d April.—Elder Brethren consider negotiations as terminated.

October.—Board of Trade. With proposal from Victoria Foundry (also received direct) to place floating light on this principle (vessel, tower, lantern, 1st-class dioptric, 40 feet above water, signal gun, and full accommodation for keepers,) to northward of Stone's Rock for 12,000*l.* Will maintain it for reasonable period; and, if not successful, will build lighthouse on Godrevy without extra charge.

Board of Trade think trial of this principle should be made; would have suggested present instance but for contracts for Godrevy Lighthouse; think there may be some place where it may be expedient to try this description of lighthouse on future occasions.

Memorials from the West of England were sent to the Board of Trade in favour of this proposition, and a deputation had an interview with the President. The completion of the contract for building a lighthouse on Godrevy was suspended during the consideration of this proposition, which was ultimately declined.

1858, March.—Board of Trade. A beacon buoy off the Stones; but that if we consider it would not be likely to stand the sea, then an iron skeleton beacon on the Outer Stone.

1858, March.—Board reply, proposing trial of beacon buoy on Herbert's principle. Will put themselves in communication with patentee, and submit such proposal as he may make, subject to guarantee for efficiency and permanence.

Mr. Renton submits terms, not including guarantee. Board require guarantee.

Mr. Renton offers it for two years, excluding damage by collision.

Terms finally amended, to include collision, beacon of 17 feet diameter, 25 feet elevation, to be replaced at station within two months if adrift, and conspicuous sea mark meanwhile, 885*l.*

These terms accepted by Board.

1858 and 1859.—This beacon was placed on 14th January 1859. Broke adrift in a gale on 4th February, and, after driving a few miles to the northward, was destroyed amongst the rocks. Its place was

temporarily supplied by a buoy purchased by contractor of the Corporation; and a second beacon, on the same principle as the one destroyed, was placed on 20th September. This parted from its moorings in the gale of the 1st November, drove on shore under Pentreath Cliff, since which no report of its condition has been received.

1858, August.—Messrs. Harvey, St. Ives. Light-vessel on Herbert's principle for the Hanois Rocks, Guernsey.

1858.—Acquainted that we have no intention of placing a floating light there.

1859, September.—Board of Trade. Transmitting Letter from Mr. Lindsay, M.P., with memorials from commanders of ships in foreign trade, at Liverpool, for a light on Herbert's principle in fairway of St. George's Channel.

1859, September.—Elder Brethren request reference to letter to their Lordships, in October 1855, reiterate observations as to dangers, and state, that having regard to improvements in lighting the channel, they retain their opinion that the exhibition of a fairway light in the position proposed is neither required nor judicious.

1854.—Baron von Reinagle. To moor a large number of floating platforms (asylums) off the Goodwin and in various places round the coast.

Acquainted that Elder Brethren will not object, but that he must come to the Board on each occasion, in order that it may be seen that the marks of direction, by day and night, are in no way interfered with.

1854, October.—C. Cartwright, Great Trinity Lane. Has a plan for placing a light on Goodwin Sands.

1854, October.—Mr. Cartwright called. Secretary explained to him that light on Goodwin was not required.

1857, February.—C. Cartwright, Great Trinity Lane. Recurs to proposal of vessel or vessels for preservation of life, and assistance to shipwrecked mariners.

(Addressed to Lord John Russell, as an Elder Brother.)

Acquainted that Corporation has no intention of placing vessels on those sands with the object he proposes, and reminded that there is already a light-vessel moored at each end of Sands.

1855, June.—J. Brown, Railway Place, Fenchurch Street. For leave to submit model of improved formation of the bottom of lightships, to prevent them in some degree from rolling and pitching, and to cause them to ride much easier.

1855, July.—Attended Board.

1856, May.—By order of the Board. To make trial of iron lightvessels.

The subject of iron lightvessels was under consideration in 1843, but they were not then deemed desirable.

1856.—Particulars requested from Liverpool, where iron lightvessels were in use.

June.—Specifications from shipbuilders obtained, and compared. Lloyds' surveyor consulted.

July.—Surveyor of shipping to prepare specification.

August.—Proposal made to Board of Trade. Board of Trade request copy of report from Liverpool. Report sent, and Board of Trade's sanction obtained.

September.—Tenders invited.

October.—Messrs. Napier's accepted.

The first iron lightvessel was placed at the Goodwin in July 1857.

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Two more are at this time building by Messrs. Vernon, of Liverpool.

1857, February.—By order of Board. That district agents should be supplied with signal rockets, to enable them to answer signals which may be made from the lightvessels.

1858, November.—Richard Roberts, Manchester. That present system of floating lights is objectionable, on account of oscillation, rendering dioptric system unavailing; that lightvessels, consequently, too nearly resemble ships' lights; that, on other hand, shore lights not being in direct course to be steered involve great nicety of calculation.

Submits plan of a floating lighthouse, with light shown on principle of "gyration," so that belt of dioptric lenses will always maintain parallelism with horizon.

This lightvessel was to be circular, moored in a particular manner, and the machinery driven by engines in the hold.

1858, November.—To lie on table for inspection.

Section.—Miscellaneous.

1846, October.—G. M. Goodwin, Almshouses, Deptford. "A light ladder." The divergence of the lights to be so arranged that the width of the beam shall indicate the distance from the shore.



Two points of compass lighted only.

	Width of Ray.		Distance from Light.
	M.	F.	M.
Note the first appearance of the light, measure the distance until you lose it; then enter the table with this distance, opposite which will be the ship's distance from the light.	1	9	5
	3	8	10
	5	7	15
	7	7	20
	9	6	25
	11	5	30

Acknowledged, with thanks. Admiralty inquire as to scheme. Acquainted that Elder Brethren do not consider it calculated to afford any practical benefit to shipping.

1847, January.—N. Perry, Westminster. Can show how to remove the Goodwin Sands.

Acquainted that it is not within the province of this Corporation.

1848, July.—C. West, Submarine Telegraph Office, Leadenhall Street. To connect all insulated light-houses with the mainland by submarine electric telegraphs.

Will begin with Eddystone at his own risk, and to be paid 1,000*l.* if successful.

Acquainted that Elder Brethren decline to accept this proposal.

1848, October.—John Knowles, formerly Light-keeper, Haisburgh. Has invented a new patent lighthouse, so that no mistake can be made.

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1849, September.—J. N. Holbrook. Lighthouse which he represents as being much improved as, respects the greater safety against shipwrecks in dark and foggy weather.

Attended and exhibited model.

1850, February.—M. Thompson, H.M.S. "Odin." A paper descriptive of general night signals which have been tried and much approved in the fleet, and which he considers adapted also for lighthouses.

Thanked for his communication, and informed, that although his plan may be found useful for purposes of ships and boats, it does not appear to Elder Brethren that it would be so for those of lighthouses.

1850, February.—W. H. Smith, Royal Exchange Buildings. A yielding lighthouse, which shall offer the minimum of surface and the maximum of resistance to the wind draught and stroke of the wave.

1850.—Models inspected by Deputy Master and several Elder Brethren.

February.—Informed that it is not the intention of the Corporation to make trial of his plan.

March.—Mr. Smith submits estimate of one 100 feet high for 11,500*l.* and enlarges on plan.

Former intimation repeated to him.

April.—Mr. Smith offers to build on his non-resisting principle at Bishop or North Sand Head for above sum, payment to depend on success and approval by our engineers.

Informed that the Elder Brethren are not disposed to entertain his proposition.

May.—Mr. Smith offers to erect at various stations, or in place of any of the light vessels, and requests reference to President of Institution of Civil Engineers.

Mr. Smith referred to previous letters, and informed that views of Board as therein expressed remain entirely unchanged.

1852, February.—John Martin, Chelsea. Renewing proposals made in 1829 with improvements, for guarding the outer edge of sands by a continuous chain of efficient lights one mile apart, without requiring the residence of a man at any one of the stations, in one to five fathoms water, and lighted by means of gas pipe running from shore to utmost extremity of line; also, for building lighthouses on sands upon sunken equilateral triangles, with iron flanges or flat anchors at the corners, &c.

(Mr. Martin memorialized His Royal Highness the Master, who referred it to Board.)

1852, February.—Previous plans adverted to. Light Committee to see Mr. Martin. Light Committee do so. Letter received from Mr. Martin. Report of Light Committee submitted to Board.

March.—Mr. Martin informed that it is not the intention of this Corporation to adopt the plans which he has brought under our notice, and the drawing returned to him. Mr. Martin, in reply, considers that invention has been adopted by Corporation in the construction of Maplin, &c., and requests compensation. Informed that Board cannot consider they have adopted any principle which he can properly call his own.

1852, May.—W. R. Reynell. To have smal attached balloons of sufficient power to raise beacon lights to any required altitude on the Goodwin Sands or other similar dangerous positions on the coast.

Acquainted that his suggestion has been laid before the Board.

1852, May.—S. Coote, Clifton. To warn mariners of sunken rocks, shoals, &c. by hanging up copper pictures of the place, suspended from beams fixed up in

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conspicuous places. Bells of the description of sheep bells, but larger, and a lantern or two at night.

Prays remuneration.

Informed that it has been laid before the Board, and that it is not the usage to grant remuneration for the production and transmission of the numerous designs which are submitted to the Board's notice.

1853, February.—Dr. M. R. Fletcher, St. Andrew's, New Brunswick. Tidal alarm apparatus.

Thanked for communication; acquainted that plan is not in any way applicable to service of Corporation.

1853, March.—J. Ridley, Hope Coffee House, Faringdon Street. Has several plans for the improvement and safety of ships, &c., one or two of which will come under the management of the Trinity House.

Attended the Board, and submitted sketches illustrative of a plan by which he proposes to conduce to the safety of shipping, by placing beacons of various forms at the entrances of harbours.

1853, July.—George Herbert, Trinity House. Iron collar and apron to prevent the tide from scouring the sand away from the base of piles.

Referred to Mr. James Walker, the Corporation's engineer, recommended by him for trial; adopted at Mucking.

1854, January.—J. W. Dilke. Telegraph wires to light vessels; transmitted by command of His Royal Highness the Master.

His Royal Highness informed that Board consider the swinging of light vessels would cause great difficulty, and that ships in inside channels driving and dragging anchors would grapple wires; and that light vessels are furnished with signal guns, rockets, &c.

1854, November.—T. McBean, Uitenhage, Cape of Good Hope. That he has written a treatise that lighthouses are false and dangerous, and requesting Corporation to publish the same.

1855.—Acquainted that we are unable to assist him.

February. Mr. McBean acknowledges receipt of our letter.

July.—Acknowledgment read.

1855, April.—W. Fletcher, Lightkeeper, Caldy. For improvement in construction of lighthouses generally, and particularly Caldy.

In these plans the lighthouse dwellings are clustered round the tower like the pedestal of a column, with a method of ventilation similar to one proposed by him in 1850, when at Burnham, for which, it having been found to answer, he received in 1853 a gratuity of 10*l*.

Receipt of plans acknowledged. Mr. Fletcher informed that no change at Caldy is contemplated at present.

1856, January.—N. Douglass. Plan for erecting iron lighthouses at sea. (Proposal annexed.)

The approval of the Elder Brethren at the ingenuity he has displayed therein communicated to him.

1856, November.—J. H. Stoqueler, Russel Court, St. James. That his Patent Elevator, capable of being raised to a height of 100 feet without oscillation, might serve the purpose of an impromptu lighthouse.

To lie on table.

1858, May.—T. Brady, Margate. That lightships on dangerous sands should be fitted with electric telegraph to sound alarm on nearest shore, in case of wrecks in their vicinity.

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Board of Trade transmit copy of same proposal for observations.

Acquainted that suggestion has been laid before the Board.

1858, May.—A. and M. D. Grissell, Hoxton. That cast-iron towers are by far the best construction for lighthouses, whilst their endurance is equal to stone, and that 5,000*l*. or 6,000*l*. would erect a second-class lighthouse and dioptric light in any part of England.

(These observations were contained in a letter, wherein Messrs. Grissell invited the Elder Brethren to inspect a lighthouse they had constructed for the Russian government.)

1859, January.—Lewis Gompertz. A substitute for lighthouses. Instead of having a building with a light at the top, to employ a small balloon of sufficient power to support a lamp to be hung under it, and being attached by a string to a post or barge, the string to be of great length, a mile or more if necessary, so that the light would be seen very far, &c.

To lie on table.

1859, August.—Capt. Acklom, Jersey. Self-acting tide pilot and beacon lights, designed for Elizabeth Castle Causeway, but capable of universal application, by tidal float acting upon gas lever cock, and turning on or shutting off a large double batwing burner, to be kindled by a small burner constantly burning.

Acquainted that Elder Brethren cannot depart from the usage of the Corporation, in abstaining from the expression of an opinion in respect of any invention with the merits of which they have no practical experience.

Fog Signals.

1848, September.—Mr. Walker, Queen's Harbour Master, Plymouth. On the subject of the bell at the Breakwater lighthouse, suggesting a method by which he considers the sound may be conveyed.

Mr. Faraday consulted thereon; not carried out.

1848, December.—Admiralty. Calling attention to Mr. Wells' instrument for producing shrill sounds by atmospheric pressure, propose trial at South Foreland.

1849.—Arrangements made for trial from 29th January to 3d February; persons in charge at North and South Sand Head and Gull Stream lightvessels directed to report. Admiralty advised. Admiralty give directions to officers of coastguard float and on shore to report. Committee of Elder Brethren observe in the "Vestal." Sound to be heard on board yacht at 2³/₁₀ miles very faint; not heard from South Sand Head or Gull Stream, nor at Ramsgate, Deal, or Dover.

February.—Mr. Wells states, that he heard it from South Sand Head, and that machine was not previously in order.

Result reported to Admiralty.

Admiralty request our opinion thereon.

Admiralty informed that we consider instrument capable of producing loud and penetrative sound, subject to influence of wind; that sound may be produced without delay, and may be continuously maintained.

March.—Mr. Wells states that he has constructed a larger whistle, should we desire a further trial.

Mr. Wells informed that experiment was made solely at request of Admiralty, and that we do not contemplate any further proceeding unless Admiralty desire it.

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1850, October.—Mr. George Wells, Upper East Smithfield. Submits improvements which he has made in his patent fog screamer.

Referred to Light Committee.

1853, October.—Mr. George Wells, Upper East Smithfield. Proposing to submit fog signal.

1853, January.—Appointment at this house.

March.—Committee report to Board as to its applicability to light establishments.

May.—Professor Faraday reports on it.

Mr. J. Walker reports on it.

Ordered for trial on board lightvessels.

September.—Report of comparative trial on board "Mouse" light. A good-sized bell, struck sharply by machinery, considered to surpass any mode yet tried.

1854, January.—Mr. Wells requested to remove apparatus from Buoy Wharf.

1850, April.—J. G. Woodward, Cecil Street, Strand. Submitting proposal for a bell (Jones's) which shall be rung instead of struck; adopted by Lighthouse Commissioners in New Brunswick; prays compensation for expenses.

1850.—Model inspected; further examination deferred.

24th April.—Mr. Woodward acquainted that we decline to grant compensation: that we may possibly make practical trial of apparatus on board lightvessel, but have not at present decided to do so.

1853, March.—Admiralty. Transmit suggestion from Lieutenant Synes, R.N., that fog bells should be fitted at all lighthouses.

1853, March.—Acquainted that bells have for some time been in use at several lighthouses, and that each lightvessel is furnished with a gong; that Elder Brethren are at present disposed to doubt whether bells would be useful at all lighthouses, but that it is still undetermined whether a bell or shrieking instrument will be best for fitting at those stations where they may be likely to be of service.

At this time the Board were in communication with Mr. Faraday as to the application of reflectors in connexion with the use of fog bells or whistles, and in August remitted it to the Light Committee to consider best mode of striking bells.

A large bell, made by Messrs. Mears, was placed at the South Stack. Mr. Faraday was consulted as to construction of belfry for sound, and Mr. E. Cooper, C.E., submitted method for sounding the bell. This bell was subsequently disused, and maroons and fog guns tried in its place.

1854.—Grubb and Co., Dublin. Mode of ringing fog bells.

Thanked for communication. Informed that Board have already decided on another plan.

1857.—Grubb and Co., Dublin. Renew proposal.

1854, October.—A. Todd, Manchester. Suggestions for striking gongs by the agency of the revolving apparatus in lighthouses.

Thanked for communication.

1855, April.—Lieutenant Cook, R.N., Addiscombe. Model of machine for sounding alarm in foggy weather.

Machine exhibited. Expense of model 1*l.* 6*s.* 8*d.*, defrayed by Corporation.

1855, November.—By order of Board. Particulars requested relative to fog bells from United States Lighthouse Board.

1856, October.—Received. Thanks returned.

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1856, March.—F. Millen, King's Cross. Has a plan for increasing sound of bell by ringing instead of striking, which has been approved.

April.—Requested to state by whom.

Attended and explained plan. Requested to ascertain cost of sufficiently large working model.

1857.—Barbarin and Sims. Electro-magnetic fog bell (transmitted by Board of Trade).

Referred to Professor Faraday, who reported thereon. Board of Trade informed of reasons against adoption.

1857, April.—Board of Trade transmit plan by B. S. Sawden. For working fog bell on Flamborough Head.

1857, April.—Board of Trade informed that it appears to be similar to that already in constant use.

1857, September.—Chamber of Commerce, Hull. With reference to a fog bell at Flamborough Head. Direct our attention to a plan for sounding one on that headland, published by Mr. Milne, of Bridlington, about 1815.

1857, October.—Board of Trade. Trial of maroons for fog signals, as suggested by Captain Boxer, R.A., of the Royal Laboratory, Woolwich.

1857.—A communication was opened with that officer, and experiments were made at Holyhead and at Woolwich, which resulted in proving large maroons to be very costly, and in the expression of a suggestion of Captain Boxer's for a very simple gun arrangement, not requiring the employment of more than one man.

Committee conferred with him thereon, and considered relative cost. This plan has not yet been adopted.

1858, September.—Board of Trade. With copy of dispatch from New Brunswick, relative to improved fog gun to be fired by clockwork, and copy of proposed reply to Colonial Office.

Acquainted that we concur generally as to proposed reply, and informed of present state of negotiations with Captain Boxer, relative to maroons.

1847, February.—Alexander Gordon, C.E., Fludyer Street. The production and distribution of sound to indicate the proximity and position of lighthouses, lightvessels, beacons, and buoys.

Not specially considered; submitted with other propositions, for which, see "Section, Lighting Apparatus," p. 38.

The question of best sort of fog signal still engages the serious attention of the Board,

A committee has recently inspected the mode of striking fog bells in use at certain Irish lighthouses; and another has visited Boulogne, for the purpose of observing an adaptation of fog signals at that port.

APPENDIX.

LIST of Papers herewith:

Report from Mr. Faraday relative to magneto-electric light.

Mr. Wells's plan for a telegraphic lighthouse.

Mr. Aston's plan for distinguishing lights.

Mr. Douglass' plan for iron lighthouses at sea.

Lieut. Manico's plan for caissons de fer.

P. H. BERTHOE,

Trinity House, London,

Secretary.

25th November, 1859.

Note.—The return was made in the form suggested, but it was found more convenient to print it as above. Several of the suggestions are omitted, because without drawings their merits cannot be appreciated.

ENGLAND

Circular I.
Question
XXVI.

XXVI.

By ROYAL LETTERS PATENT.

IMPROVEMENTS in LIGHTHOUSES, BEACONS, &c. for marine banks or rocks of any description, either tidal or totally submerged in any situation required for the purposes of commerce; also applicable to the construction and erection of piers, breakwaters, batteries, and other similar erections.

By N. DOUGLASS,
Engineer.

Having been requested by the late Deputy Master and some of the Elder Brethren of the Honourable Corporation of Trinity House to turn my attention to a plan for erecting a lighthouse on a rocky shoal in the English Channel, I have planned and matured a more certain and effective mode of obtaining a foundation and raising a permanent structure on a bank of any description, whether soft material or the hardest rock, which at once removes all the usual delay and uncertainty attending the erection of such structures of which the inventor has had near 30 years experience.

I employ wrought or cast-iron cylinders, which, to render imperishable in salt water, I enclose in an outer casing of iron or zinc, with a space between filled with bitumen, run in hot, so that when the outer casing is entirely destroyed, the main cylinder is enclosed in an impermeable material. The cylinders I construct on shore, and fit with temporary water-tight bottoms; they are then to be fitted into a raft or pontoon of a peculiar construction in their proper position, and so that they may be let down through the raft to any depth. The raft to be formed of large wrought-iron cylinders, with all necessary staging, cranes, and workmen's barracks, &c. erected thereon, and the whole to be floated to the proposed site for the erection; the cylinders are then let down through the raft on to the bank and filled, thereby forming a temporary structure for further operations. If required on a bank of loose material, I proceed with the cylinders one or more at a time, as follows:—The bottom is first to be removed, and the material excavated either by a dredging machine misering or digging, or any other method, depending on the nature of the ground, the cylinders being sunk to any depth, as in well or shaft sinking for mines, until a proper strata is arrived at for the foundation, so as to be safe from any future shifting of the bank.

To give the cylinder increased bearing surface for either upward or downward strain, I let down to the bottom of each a cylindrical foot with hinged flanches, which on being drawn up against the bottom spreads out and gives any extra bearing surface; required; the cylinders are then to be filled up with cement, concrete, or any other approved material, and connected together above high water in a solid body, without the use of stays of any description; upon this can be raised any superstructure desired.

If required on a rocky bottom, after obtaining a temporary fixing on the site as before, the cylinders are to be fitted with temporary man-holed covers, and air forced into them, thereby expelling the whole of the water, and enabling the workmen to go down and cut the rock to obtain a proper fixing; the cylinders are then to be filled and connected together at the top, as before, for receiving the superstructure.

London, 1st January, 1856.

PLAN and SUGGESTIONS for a Telegraphic Lighthouse, as an improvement on the present lighthouses, by GEORGE WELLS, Esq., of the department of the Admiralty, Somerset House.

The numerous, serious, and fatal accidents that vessels, and particularly steam ships, have encountered within the last few years, owing, in many instances, to the mistakes of mariners as to the distance and position of the several lighthouses which abound on our dangerously navigable coast, render it unnecessary to waste any time in an attempt to prove that there must be something radically wrong in the construction of these beacons of the deep, and the mode of warning for which they are intended.

It is not enough that they are based upon the several points of danger, whether shoals, sands, or rocks, so long as the possibility exists of their being mistaken one for another, which, unhappily, from the want of a more distinctive character, has been too frequently the case, involving the sacrifice of life to an awful extent, and the minor, though heavily injurious, loss of property.

To remedy such frightful evils, the inventor of the telegraphic lighthouse has long and anxiously turned his attention, and now offers to the government of the country a plan, which, by giving to every lighthouse a *determinate and unmistakable character as to its position*, must, with

XXVI.

the slightest ordinary care, prevent the recurrence of the dreadful disasters referred to.

The existing lighthouses are objectionable in three particulars:—

First. Their unnecessary elevation, which gives them the appearance of being at a greater distance than they really are,—a dangerous delusion.

Second. In giving coloured lights to some, which is worse than useless, as in hazy or foggy weather the density of the atmosphere creates such an optical illusion, as completely to vary all description of colour, and consequently to lead the seaman to hesitation, and thence, too often, to destruction.

Third. The general insufficiency of the light, and its similarity in appearance, which not infrequently misleads the mariner as to the actual locality of the lighthouse and the course of his ship; as was evidenced, amid many other instances, in the fatal disaster that befel the unfortunate "Great Britain," though under the guidance of an experienced sailor as ever tried a plank.

To obviate such awful and afflictive mischances, the telegraphic lighthouse now under consideration is suggested as a *safe and unerring substitute* for the present system, being, from its *pointed designation, simplicity of intelligence, and clearness of character, totally secured from any possibility of misapprehension*, having the further advantage of being understood by mariners of all nations.

The process of the proposed change in the existing lighthouse is exceedingly simple, and the expense of it comparatively trifling, bearing in mind the security it would insure; being no more than the cutting four or more circular apertures in all the present erections, just below the lantern, and fitting the openings with glazed sashes of ground plate glass, with the initial letter of the particular lighthouse painted in an opaque colour thereon, the light being so reflected as to render the *unpainted* glass transparent, and thus exhibiting the letter itself in bold relief, as shown by the letter *J* in the vignette.

The length of the letter being twice the size of the light of the lantern would be more clearly visible, and leave no doubt as to *what* the lighthouse is, and *where* situate. "Tis the few moments lost in thinking what lighthouse it is, that allows the ship to be drawn by wind or current upon the iron-bound rock, where all are lost."

This alteration is suggested for the existing lighthouse, but where it might be necessary to construct new ones, it would be better they should not be carried to the present altitude, as the nearer the light is level to the eye, the less probability would exist as to any mistake in the distance of it.

The model of this proposed lighthouse has been exhibited at the sires of the Marquis of Northampton (President of the Royal Society), and was honoured by the *especial* notice of His Royal Highness Prince Albert, and many scientific persons present. The press has also declared its approval of the proposed plan.

GEORGE WELLS,
Admiralty, Somerset House.

By HER MAJESTY'S ROYAL LETTERS PATENT.

CAISSON DE FER, for obtaining foundations for marine and other structures.

The caisson de fer is three feet square, made of three-inch by half-inch flat bar iron, put together with three quarter-inch screw bolts and nuts, and when filled with rough stones, and the interstices with sand, weighs upwards of two tons.

These caissons de fer, possessing the power of arresting the violence of the sea, can be advantageously used on any exposed coast, where vessels are so frequently lost, when caught in bad weather, for want of a place or shelter to run for. They are also well adapted for the construction of floating docks or canals, reclaiming land washed down by the sea, and especially for erecting works on dangerous sand banks. For this purpose they are intended to be let down on the bank, into which they will subside to the foundation, the sand filling in whatever space may be left between them. In this subaqueous work is securely retained the alluvial deposit which is constantly agitated by the currents, and a solid increasing embankment is hereby created, whereon any superstructure may be raised with perfect safety; affording efficient protection to shipping by these means in less time and at less cost than any harbour work on the coast.

E. MANICO, Lieut., R.M.,
Inventor and Patentee.

4, Barge Yard, Bucklersbury, E.C.
5th April, 1858.

The folio is placed in the section to which the communication relates.

Name.	Nature of Light.	Lighting Apparatus.	Distinction of Light.	Lighthouses on Sands.	Lighthouses.	Miscellaneous.	Name.	Nature of Light.	Lighting Apparatus.	Distinction of Light.	Lighthouses on Sands.	Lighthouses.	Miscellaneous.		
A.							I.								
Acklom, Capt.	—	—	—	—	—	48	Love, Capt.	—	38	—	—	—	—		
Admiralty	—	—	—	—	—	48	M.								
	—	—	—	—	—	49	McBean, T.	—	—	—	—	—	48		
Amusement, B.	—	—	—	—	—	—	McGill, D.	—	—	—	—	43	—		
Asiby, W. S.	—	—	—	—	—	—	Manico, Lieut. R.N.	—	—	—	—	45	—		
Aston, T.	—	—	41	—	—	—	Martin, B. G.	—	—	—	—	41	—		
Austin, W.	—	—	—	44	—	—	" John	—	—	—	—	—	47		
B.							Milten, F.	—	—	—	—	—	49	—	
Balzac, C.	—	—	41	—	—	—	Mitchell, Messrs.	—	—	—	—	45	—		
Banner, Robt.	—	—	—	—	45	—	Morris, J. S.	—	—	—	—	41	—		
Barbary and Sims	—	—	—	—	—	49	Mosselman	—	—	—	—	—	—		
Beard, by order of	35	30	—	—	46	46	Motte, W. R. I.	36	—	—	—	—	—		
" "	—	40	—	—	—	—	N.								
" "	—	—	—	—	47	—	Napier, J.	—	38	—	—	—	—		
" "	—	—	—	—	—	—	Neele, J.	—	—	—	44	—	—		
Belton, B.	—	—	—	42	—	—	Nicholson, W.	36	—	—	—	—	—		
Beuany, W. W.	36	—	—	—	—	—	O.								
Borrass, S.	—	—	—	43	—	—	Owen, Admiral	—	38	—	—	—	—		
Bouton, C. D.	—	—	42	—	—	—	P.								
Brady, T.	—	—	—	—	—	48	Penrice, J.	—	—	—	41	—	—		
Brederton, Messrs.	36	—	—	—	—	—	Perival, Hon. and	—	—	—	—	45	—		
Brown, J.	—	—	—	—	46	—	Rev. A.	—	—	—	—	—	—		
Brown, Sir Samuel	—	—	—	42	—	—	Perry, N.	—	—	—	—	—	47		
C.							Phelps	—	38	—	—	—	—	—	
Cartwright, C.	—	—	—	—	46	—	Piron, Duval	—	—	—	43	—	—		
Chance Brothers	—	40	—	—	—	—	Plumley, E.	—	—	41	—	—	—		
Chard, A.	—	—	44	—	—	—	R.								
Charlton, Geo.	36	—	—	—	—	—	Redman, G. C.	—	—	—	43	—	—		
Childs, James	—	39	—	—	—	—	Renton, A. H.	37	—	—	—	—	—		
Clay, W. N.	—	—	42	—	—	—	Rettie, R.	—	39	—	—	—	—		
Clark, Richard	—	39	—	—	—	—	Reynell, W. R.	—	—	—	—	47	—		
Cook, Lieut., R.N.	—	—	—	—	—	49	Ridley, John	—	—	40	—	—	48		
Cook, S.	—	—	—	—	—	47	" "	—	—	—	—	—	—		
Cope, F. C.	37	—	—	—	—	—	Robert, Richard	—	—	—	—	47	—		
D.							Robertson, A.	—	—	—	43	—	—	—	
Darley, W.	—	—	44	—	—	—	Robinson, Rev. J. B.	—	—	—	43	—	—		
Davey, J.	—	—	—	—	—	48	S.								
Dilke, J. W.	—	41	—	—	—	48	Serrall, J. E.	—	—	—	43	—	—		
Douglass, N.	—	—	—	—	—	48	Shepherd, G.	—	—	—	42	—	—		
Dundonald, Earl of	—	—	44	—	—	—	Shortland, Capt.,	—	—	—	—	—	—		
E.							R.N.	—	—	—	—	—	—	—	
Evans, E.	—	—	43	—	—	—	Sims, see Barbary	—	—	—	—	49	—		
F.							Sinclair, G.	—	—	—	—	44	—	—	
Taraday, Professor	—	38	—	—	—	—	Smith, J.	—	38	—	—	—	—		
" "	—	38	—	—	—	—	" Ed.	—	—	41	—	—	—		
" "	—	40	—	—	—	—	" T. E.	—	—	—	44	—	—		
Fitzmaurice, Major	37	—	—	—	—	—	" W. H.	—	—	—	—	—	47		
Fletcher, Dr.	—	—	—	—	—	48	Stait's Patent	—	36	—	—	—	—		
Fletcher, W.	36	—	—	—	—	48	Stanford, J. F.	—	—	—	44	—	—		
Fox, Sir Chas.	—	—	—	43	—	—	Steuell, E.	—	—	—	44	—	—		
G.							Stoqueller, J. H.	—	—	—	—	—	—	48	—
Glorer, Rev. F. A.	—	—	42	—	—	—	T.								
Goldfinch, J.	—	—	43	—	—	—	Taylor, Rear Ad-	—	—	—	—	45	—		
Gompertz, L.	—	—	—	—	—	48	Thompson, M.	—	—	—	—	—	47		
Goswain, G. M.	—	—	—	—	—	47	Todd, A.	—	—	—	—	—	49		
Gordon, Alex.	—	38	—	45	49	—	Trade, Board of	—	—	—	—	—	49		
Grazebrook, G.	—	—	45	—	—	—	" "	—	—	—	—	—	49		
Grieve, B. & others	—	—	45	—	45	—	" "	—	—	—	—	—	49		
Griswell, A. & M. D.	—	—	—	—	—	48	" "	—	—	—	—	—	49		
Grubb and Co.	—	—	—	—	—	49	" "	—	—	—	—	—	—		
H.							V.								
Haber, Chevalier	37	—	—	—	—	—	Vereker, H.	—	36	—	—	—	—		
Hall, Capt., R.N.	—	—	42	—	—	—	Vincent, W.	—	—	—	42	—	—		
" Jas.	—	—	—	45	—	—	Von Reinagle, Baron	—	—	—	—	46	—		
" W. E.	—	—	44	—	—	—	W.								
Härbord, W.	—	—	45	—	—	—	Wallen	—	—	—	—	—	—		
Harvey, Messrs.	—	—	—	—	—	—	Ward, Rear Admiral	—	—	40	—	—	—		
Hays, J. de La	—	—	42	—	45	—	Watson, Dr. J. G.	—	36	—	—	—	—		
Herbert, George	35	—	45	—	48	—	Way, Professor	—	37	—	—	—	—		
Holbrook, J. N.	—	—	—	45	47	—	Wells, Geo.	—	—	41	—	—	—		
Holman, Professor	37	—	—	—	—	—	West, C.	—	—	—	—	—	49		
Horend, J.	—	—	43	—	—	—	Wilkins, Messrs.	—	38	—	—	—	—		
" J. W.	—	—	—	—	—	—	" "	—	39	—	—	—	—		
Hull, Chamber of	—	—	—	—	—	49	" "	—	40	—	—	—	—		
Hutchinson	—	—	—	—	—	—	" "	—	—	—	—	—	—		
J.							X.								
James, C.	—	—	—	44	—	—	Winder, T. K.	—	—	—	44	—	—		
James, J.	—	40	—	—	—	—	Wise, C.	—	—	—	42	—	—		
Japlin, Jos.	—	—	41	—	—	—	Woodward, J. G.	—	—	—	—	—	48		
J. S.	—	—	40	—	—	—	Y.								
K.							Z.								
King, W.	—	—	—	43	—	—									
Knowles, J.	—	—	—	—	—	47									

RETURN to Requisition, dated 3d May 1859,

FOR

“ All Correspondence between the Trinity House and the
 “ Board of Trade relative to the Debt due to the
 “ Bank of England for Monies borrowed for pur-
 “ chasing Lighthouses;” also for, “ Copies of all
 “ similar Correspondence relative to Proposals for the
 “ Reduction of Light Dues made by the Trinity
 “ House to the Board of Trade.”

No official correspondence has passed between the two Boards.

The Debt due to the Bank of England was incurred at a time when money was comparatively cheap, with a view to pay off or reduce the debt to Her Majesty's Treasury and outstanding bonds to sundry individuals, which were bearing a higher rate of interest.

The general debt incurred by the Corporation for the purchase of private lights under the provisions of the Act 6 & 7 William IV. c. 79. amounted to 1,182,546*l*. This sum was obtained from various sources, and was gradually repaid at the rate of 7,500*l*. per annum (with one exception) until 1844, from which time repayments were made at a much larger rate, viz.—

		£		s. d.	
In 1844	—	74,000		181,498	2 4
1845	—	141,000		62,381	13 4
1846	—	129,000		71,081	4 7
1847	—	107,500		87,000	0 0
1848	—	119,500		45,000	0 0

And at the time when the Merchant Shipping Act came into operation (October 1853) the sum of 67,500*l*. alone remained to be liquidated.

Before October 1853 the power to reduce light duties rested with the Trinity House, subject to the assent and confirmation of Her Majesty in Council; and although the Board of Trade, as being the Committee of the Council to whom the propositions of the Trinity House would be

referred, may have been communicated with on the subject, no official correspondence took place.

The questions of the Corporation's debt and of the reduction of light dues have this bearing on each other, that the power to reduce and alter light duties under the 56th and 57th section of the Act 6 & 7 William IV. c. 79. was a continuation and extension of the power to reduce, previously and for the first time given to the Trinity House by the 4th section of the Act 3 Geo. IV. c. 111, its exercise having been limited, so that it should be “ consistent with the charitable and other purposes and intents “ for which the said Corporation has been established and “ maintained,” and that the debt above adverted to was secured upon the surplus dues; until, therefore, the bulk of it was discharged, the Elder Brethren were not in a position to effect any extensive reduction in the rates for lighthouse tolls, although in 1843, as a measure of immediate relief, a reduction was made on oversea and coasting vessels amounting to about 80,000*l*. per annum, and in 1852 the rates, for coasting vessels only, were further reduced to the extent of between 30,000*l*. and 40,000*l*. per annum.

The amount unliquidated in 1854, viz., 67,500*l*., was repaid in moderate instalments, and being comparatively trifling the Board of Trade were then enabled to carry into immediate effect reductions which the Corporation had for a long time contemplated as the result of the liquidation of the debt.

These reductions have not been so extensive as regards English lighthouse tolls as might have been the case had the revenue arising therefrom not been carried to a common fund upon which the charges of the three lighthouse boards have been consolidated.

Since 1853 the initiative in reductions has always been taken by their Lordships under the provisions of the Merchant Shipping Act.

Trinity House, London,
3d February 1860.

P. H. BERTHOE,
Secretary.

Dues complaints.

DUES, &c.

(Part of Answer to No. XIX., Lighthouses General Return; No. XX., Floating Lights General Return; and entire answer to *h, i, j*, No. XXIV., Return on account of Buoys and Beacons.)

General Remarks. (In answer to Questions XLV., XLVI., XLVII., Lighthouse Special Return; LII., LIII., LIV., Floating Light Special Return; XXIV., *h, i, j*, Buoys and Beacons.)

Complaints or representations as to “ Tariff of Dues,” “ Overcharge,” or “ Mode of Collection,” are seldom made against particular lights; the three which have occurred since 1st October 1853, one for the Owers, one for the Eddystone, and one for the Bardsy, are given in their places; the objection of the Corporation to the imposition of a toll for the Bishop is also stated in the return for that light.

The complaints or representations of a general character have been as follows:—

First, as to Tariff of Dues.

December, 1853; July, 1854; April, 1856. Representations as to light dues, or refusals to pay them, were received on account of vessels with limestone, chalk, &c., at Truro, Milford, and Woodbridge respectively. Explanations were given, and a rule enforced that vessels should be charged provided they have more on board than is sufficient for purposes of ballast, say one third of tonnage.

March, 1854. The Newcastle, Shields, and Gateshead Chamber of Commerce (to Board of Trade) propose (1) that lights should be maintained from general resources of the country; or,

That no further sum should be levied in shape of light dues than may be requisite for maintenance.

(2) That duties be only payable in proportion to the quantity of merchandize carried, and that minerals of small

DUES, &c.

value, in proportion to their bulk, such as coals, stone, and the like, should only be subject to half dues.

Reply.—(1) That Elder Brethren consider present system of charging vessels for lights actually passed the most equitable principle; that, in other countries were lights are maintained out of the general revenue, vessels are subject to a tonnage duty, which is applied to general purposes of the state.

That present revenue (1854) is little more than adequate to meet expenses.

(2) That plan would be found most inconvenient and embarrassing, and could not fail to be constantly productive of disputes between the collectors, and masters, or agents, and would tend to encourage fraudulent evasions.

February, 1859. The Newcastle, Shields, and Gateshead Chamber of Commerce (to Board of Trade) propose that vessels carrying cargo to the extent of not more than one-tenth of their register tonnage may be exempted from payment of light dues; the present system causing nearly every one of the hundreds of French vessels which come to the north-eastern ports for coals, to come in ballast; and nearly every one of the hundreds of British vessels which carry coals to the northern ports of France, to return to the Newcastle district in ballast.

Reply.—Elder Brethren of opinion, that present charge for light dues for return voyages from the north-eastern ports of France, does not operate as a total prohibition to the carrying freight; the amount of duties chargeable on a vessel of 200 tons for the voyages in question being, to or from Dunkirk, fourpence; to or from ports south of Dunkirk to Dieppe, ten shillings and fourpence; to or from ports west of Dieppe to Havre, fifteen shillings and fourpence; and that it would not be practicable to carry out an exemption from payment of light dues in favour of vessels having only a portion of their tonnage on freight.

April, 1859. Chamber of Commerce (1) demur to accuracy of figures, and state that either Trinity House have very

DUES, &c.

grossly mis-stated facts, or Custom House, Newcastle, very grossly overcharged vessels.

(2) Do not consider objection of Trinity House as to practicability worthy of a moment's notice; that it would be an insult to officers of customs to suppose they would not be capable of protecting the lighthouse fund.

Reply.—(1) Elder Brethren point out that duties for lights, &c. on east coast, with the exception of those for "Tees buoys," are payable once only for the whole voyage out and cargo and that, consequently, a vessel of 200 tons carrying home; to Dunkirk may return to any north-east coast port, fully loaded, at a charge of fourpence only, and from the other ports as stated.

(2) Elder Brethren reiterate opinion that it would not be practicable, and have reason to believe officers of customs in London coincide with them.

February, 1855. Messrs. Kemp and Co., Fleetwood, Whether vessels, arriving on a Sunday, and paying dues on the Monday for lights passed on the Sunday, are not exempt from paying again for same lights up till midnight on Monday, under the 24 hours exemption clause, and Sunday being a *dies non*.

Reply.—Acquainted that Elder Brethren do not consider the clause in the tables: ("Vessels are to be charged for one passage only in any one day, although any number of passages more than one may be made; the day to be computed from midnight to the midnight following"); provides for such exemption, either directly or by the most extended application of the words.

November, 1859. The Scilly Islands Steam Navigation Company, trading from Scilly to Penzance, and *vice versa*, pray exemption from light dues one way.

Reply.—Informed that it can only be granted if lights are passed the second time within the 24 hours.

July, 1855; June, 1856. Collector, Faversham. That the owner of certain oyster-boats refuses to pay the commutation.

Reply.—Ordered to be enforced.

August, 1856. Collector, Yarmouth. That a lugger with a bought cargo of salt herrings from Whitby refuses payment.

Reply.—Ordered to be enforced.

November, 1856. Letter from Collector, London, with remembrance from Mr. Saunders, and others, in reply to demand for payment of light duties on vessels bringing into the port of London fish caught by other vessels; the owners claiming exemption from payment thereof under the Billingsgate Market Act, 9 & 10 Vict. cap. 346, sect. 17.

Reply.—Informed that Act quoted is controlled by Merchant Shipping Act, 1854, and that exemption not being in table of light dues, is virtually of no effect; but opportunity was taken to re-consider the whole subject of light dues paid by fishing vessels, and an Order in Council was obtained, enacting that "all vessels, smacks, and boats supplied with ordinary fishing gear, and employed solely in fishing, shall be exempt from the payment of light dues whilst they are employed in carrying to port fresh fish from the fishing grounds."

March, 1859. Collector, Shoreham. That owner of an oyster-vessel from Jersey, pleads exemption under commutation payment from Jersey to Stangate.

Reply.—Dues to be charged from Jersey to his port, unless vessel is *bonâ fide* a fishing vessel carrying fresh fish to port.

October, 1855. Mr. W. S. Day, agent for the "Cornelis Gips," from Akyab to Cowes, and thence to Amsterdam, considers that there can be no further charge for light dues beyond Cowes.

Reply.—Acquainted with liability for lights, which ship must pass in prosecuting voyage to completion.

May, 1857. Collectors at Sunderland and Newcastle represent that vessels clear for Rotterdam and Archangel; the latter port being inserted in order to obtain a larger amount of duty-free stores.

Reply.—Instructed to charge light dues on that voyage on which most lights are passed, and that question of repayment on ground of vessels adopting nearest port will be taken into consideration, upon evidence of having done so and discharged all the cargo there.

DUES, &c.

February, 1858. Messrs. Lange, Brothers, request return of lights on a vessel which cleared from Newcastle for Rotterdam and Odessa, but proceeded only to Rotterdam; clearing for Odessa for the purpose of obtaining a larger quantity of bonded stores.

Reply.—The corporation's solicitor consulted; vessel held to be bound by clearance; application for return not complied with.

June, 1857. Messrs. Dunlop and Schwabe, agents for the Vanderbilt Steam Line. Conceive that the "North Star," and other vessels from New York to Cowes, and thence to Havre and Bremen, should only be charged lights as far as Havre.

Reply.—Informed that dues are properly and legally chargeable to Bremen; but that if whole of cargo, and all the passengers are landed at Havre, the board will consider question of return.

October, 1857. Application from Mr. Clift for exemption of dues on the "Eagle," which put into Falmouth, with loss of spars.

Reply.—Collector reports, that although the vessel had lost her spars as represented, she came to Falmouth for orders, which on her arrival she received. Dues to be levied.

June, 1858. Collector, Cowes, reporting that a Belgian vessel had refused to pay dues when calling for orders, "she not having entered the port or cast anchor."

Reply.—Owner acquainted with his liability through the British Consul at Antwerp. Amount paid.

March, 1857. Mr. Churchward, Dover, claiming exemption from dues on the "Vivid" and "Princess Alice," "vessels *bonâ fide* the property of Her Majesty."

Reply.—Found to be lent to the contractor for commercial and postal purposes. Dues ordered to be charged.

November, 1858. Agent to manufacturers of submarine telegraph cable, praying exemption from dues on vessels employed in laying cable in North Sea.

Reply.—Regarded as liable.

March, 1856. Board of Trade informed of corporation's practice of many years' standing of allowing a commutation on transports taken upon monthly pay, and requested to sanction continuance thereof, under present altered circumstances of disposal of lighthouse tolls.

Reply.—January 1857. Board of Trade state that they have been in communication with Admiralty, who concur with them in thinking that ships taken up by Government, should be placed on the same footing as to payment of light dues as all other merchant vessels; but that change should not apply to vessels now under contract, and that due notice should be given.

1856. In 1856, the method of checking the clearances of coal ships from the north-eastern ports to foreign destinations, by examination of reports of arrivals in the "Shipping Gazette," being under review, and there being reason to believe that many vessels cleared short of the voyages on which they actually proceeded, an arrangement was made (in 1857), through the instrumentality of the Board of Trade, by which British consuls at foreign ports furnished lists of English vessels arriving thereat, a suggestion was made to the Board of Trade that these consular returns should include *foreign* vessels from English coal ports, but—

Reply.—Board of Trade think it objectionable to invite aid of foreign governments to recover British light dues evaded by their vessels, and having regard to difficulty of recovery, do not think it worth while to put Her Majesty's consuls to the additional trouble.

These foreign vessels are accordingly still traced by reference to "Shipping Gazette," and any evasions recovered upon next appearance of vessels in this country.

December, 1853. Collector, Shoreham, observes upon reductions in light dues by percentage abatement, "would it not be better to adopt the principle of the penny postage, and adopt the charge per vessel, thus: vessels coastwise under 50 tons, 3d.; from 50 to 100 tons, 6d., &c., &c., which would avoid fractions and complication in the accounts. Something similar might be adopted as to oversea vessels."

Reply.—Read.

Dues complaints.

DUES, &c.

Second, as to Oercharges.

The following classification of the repayments in the years 1857 and 1858 is submitted:—

	No. of Vessels.	1857.		No. of Vessels.	1858.	
		£ s. d.			£ s. d.	
Charges made by collectors in error	143	130	16 3	141	151	13 10
Charges correctly levied in the absence of the previous light bill, but returned upon its production	60	121	3 0	53	284	17 8
Charges correctly levied for voyages which were afterwards abandoned	37	201	1 4	43	172	0 11
Charges correctly levied on vessels which were afterwards wrecked	20	80	2 7	20	44	15 11
Charges correctly levied on stated tonnages, but returned on re-measurement	16	23	6 7	30	45	13 3
Charges on outward bound ships for "the usual course," when two or more are open, but returned on evidence of deviation	31	131	18 1	37	167	0 9
Charges on vessels putting into port in distress, but discharging cargo for repair, return being made if cargo is entirely re-shipped, and vessel proceeds on original voyage	1	3	5 2	1	9	5 11
*Charges made on vessels treated as with cargo, but returned by order of Board	4	32	2 4	5	18	9 5
Total	315	£724	15 4	370	£803	17 8

*The particulars of these nine vessels are as follows:—
 April, 1857.—"Forest City." Ten bags of ram, four hogheads of vinegar, excess stores, with some silks, the property of the captain, allowed by customs to clear as in ballast, 200 tons of ballast on board.
 May, 1857.—"Marmora." A few dozen of Bordeaux in bottles, to owners' use.
 July, 1857.—"Laurel." Less than one third of tonnage of cliff stone as ballast.
 October, 1857.—"Bertha." Four boxes and two vases of artificial flowers, and four cases of glass toys belonging to crew, and not for sale.
 February, 1858.—"Sarah." One bundle containing a sail for another vessel not on freight.
 March, 1858.—"St. Croix." Sixty tons of shingle as ballast.
 July, 1858.—"Meteor." Three crape shawls in captain's baggage intended by him as a present for his wife.
 November, 1858.—"Maria Elizabeth." One case of jewelry, value 15*l.*, personal property of captain.
 November, 1858.—"Cuirant." 112 lbs. of tobacco, ships stores, vessel otherwise in ballast.
 Five vessels of a similar character were exempted from dues in the years 1857 and 1858, and applications for exemption or repayment on 11 vessels were refused, the quantity or nature of goods on board bringing them properly under the meaning of vessels with cargo.

Third, as to Mode of Collection.

April, 1858. Mr. Hutchinson, Hull, that the steamer "Ilawk," from Hull to Bristol, is greatly delayed by having to pay lights at Plymouth, on calling there for orders, in consequence of arriving and departing from thence after official hours, and requesting that payment may be made at Hull.

Reply.—Informed that it is contrary to regulations to charge a coasting vessel at the port of clearance; but that instructions have been given to pass the vessel at Plymouth and charge full dues for the whole voyage at the respective ports of ultimate discharge.

February, 1857. Messrs. Garratt and Gibbon refuse to pay light dues at the Motherbank on two oversea vessels anchoring there for orders, the masters receiving instructions to discharge at a British port.

DUES, &c.

Reply.—Informed that security of revenue requires that duties should be collected from all vessels touching for orders at the Motherbank, even though bound to British ports.

July, 1858. The practice at the western channel ports as regards vessels calling for orders, and declaring their ultimate ports of destination to be British, was to charge for those lights only which had been actually passed, leaving the collector at the ultimate port to receive the remainder; but it appearing that no security existed against the vessels completing their voyages to foreign ports instead of to British, and so evading further charges, an order was issued, "that light duties upon all vessels calling for orders shall be paid at the port where the orders are received, both for lights already passed, and also for those which must necessarily be passed in the prosecution of the voyage to the port of ultimate destination."

This regulation caused the following representations and replies:—

July, 1858. Mr. Phelps, of Plymouth, to collector, objecting on ground of delay caused, and because regulation puts masters to expense of obtaining money at high rate of commission.

Reply.—Regulation must be enforced, but not to take effect until 1st October.

August, 1858. Messrs. Hill, Plymouth, object on ground of delay, and question legality of charging lights not then passed.

Reply.—That on careful consideration of whole matter, Elder Brethren are under necessity of adhering to regulation.

October, 1858. Mr. S. Ward, United States Consul, Bristol, in applying for a repayment observes that much inconvenience arises from regulation, and that it subjects American vessels to consular fees, which could otherwise be avoided were the dues paid at port of discharge.

January, 1859. Messrs. Hudson and Sons, Sunderland, request that light duties for the whole of an oversea voyage, to ports in England, may not be charged at the intermediate port of call.

Reply.—Informed that present arrangement has been found necessary, regret that their request cannot be complied with.

July, 1859. Collector, Scilly, that many masters refuse, and make objections, when called upon to pay the duties. Requests copies of the notice.

Reply.—Copies sent.

September, 1858. Collector, Poole, that agents, and others, object to payment of dues prior to reporting vessel, and to know if he can refuse report until light dues are paid.

Reply.—Solicitor advises that Merchant Shipping Act does not justify his doing so, but that dues can be demanded immediately on becoming due, and failing payment, the ship detained on.

Trinity House, London,
11th April 1860.

P. H. BERTHOE,
Secretary.

CIRCULAR No. II.—LIGHTHOUSES.—GENERAL RETURN.

ENGLAND.
Circular II.

I. The Corporation of Trinity House of Deptford Strond, Trinity House, London, E.C.

II. List of Lighthouses under the superintendence of the Trinity House:—

1. Fern Inner, High.
2. Fern Inner, Low.
3. Fern Outer, Longstone.
4. Coquet.
5. Tynemouth.
6. Whitby, North.
7. Whitby, South.
8. Flambro'.
9. Spurn High.
10. Spurn Low.
11. Hunstanton.
12. Cromer.
13. Haishro' High.
14. Haishro' Low.
15. Winterton.
16. Lowestoft High.
17. Lowestoft Low.
18. Pakefield.
19. Orford High.
20. Orford Low.
21. Harwich High, Upper Light.
22. Harwich High, Lower Light.
23. Harwich Low.
24. Langward Fort.
25. Gunfleet.
26. Maplin.
27. Chapman.
28. Mucking.
29. North Foreland.
30. South Foreland High.
31. South Foreland Low.
32. Dungeness.
33. Beachy Head.
34. St. Catherine's.
35. Needles.
36. Hurst High.
37. Hurst Low, Upper Light.
38. Hurst Low, Lower Light.
39. Portland High.
40. Portland Low.
41. Caskets, St. Peter's.
42. Caskets, St. Thomas.
43. Caskets, Dungeon.
44. Start.
45. Start Lower Light.
46. Plymouth Breakwater.
47. Plymouth Breakwater Lower Light.
48. Eddystone.
49. Falmouth Harbour.
50. Lizard Eastern.
51. Lizard Western.
52. Longships.
53. St. Agnes, Scilly.
54. Bishop, Scilly.
55. Godrevy.
56. Trevoze Head High.
57. Trevoze Head Low.
58. Lundy High.
59. Lundy Low.
60. Bideford High.
61. Bideford Low.
62. Burnham High.
63. Burnham Low.
64. Avon.
65. Usk Upper Light, the Bright one.
66. Usk Upper Light, the Red one.
67. Usk Lower Light.
68. Flatholm.
69. Nash Eastern or High.
70. Nash Western or Low.
71. Caldy.
72. St. Ann's Head High, Milford Haven.
73. St. Ann's Head Low, Milford Haven.
74. Smalls.
75. South Bishop.
76. Bardsey.
77. South Stack, Upper Light.
78. South Stack, Low (occasional) Light.
79. Skerries.
80. Menai.
81. Air.
82. St. Bee's.
83. Heligoland.
84. Gibraltar.

(A Chart was furnished.)

III. Position embracing largest arc of horizon and best indicating the dangers of the locality.

IV. Entirely dependent on locality.

V. Dioptric, first, second, fourth, and sixth order. Catoptric.

VI. Dependent upon the extent of the arc to be illuminated.

VII. Fixed, revolving, flashing, and intermittent.

VIII. Dependent upon lights in the vicinity.

IX. Attached.

X. Small lithographic drawings sent.

TABLE OF PRICES.

	Price	-	-	-	Fixed* 1,313 <i>l.</i> 10 <i>s.</i>
	Ordinary repairs	-	-	-	1 <i>8l.</i> 0 <i>s.</i> 2 <i>d.</i>
Oil	{ Consumption	-	-	-	10 <i>gals.</i> 3 <i>qrs.</i> 1½ <i>pts.</i>
	{ Cost	-	-	-	1 <i>l.</i> 16 <i>s.</i> 4½ <i>d.</i>
Wicks	{ Consumption	-	-	-	1 <i>yd.</i> 0 <i>ft.</i> 1 <i>in.</i>
	{ Cost	-	-	-	7½ <i>d.</i>
Price	-	-	-	-	Flashing* 1,217 <i>l.</i> 7 <i>s.</i>
Ordinary repairs	-	-	-	-	-
Dioptric.	Oil	{ Consumption	-	-	10 <i>gals.</i> 3 <i>qrs.</i> 1½ <i>pts.</i>
		{ Cost	-	-	1 <i>l.</i> 16 <i>s.</i> 4½ <i>d.</i>
1st order.	Wicks	{ Consumption	-	-	1 <i>yd.</i> 0 <i>ft.</i> 1 <i>in.</i>
		{ Cost	-	-	7½ <i>d.</i>
Price	-	-	-	-	Revolving* 1,495 <i>l.</i>
					including fitting, transport, &c.
Ordinary repairs	-	-	-	-	No experience.
Oil	{ Consumption	-	-	-	10 <i>gals.</i> 3 <i>qrs.</i> 1½ <i>pts.</i>
	{ Cost	-	-	-	1 <i>l.</i> 16 <i>s.</i> 4½ <i>d.</i>
Wicks	{ Consumption	-	-	-	1 <i>yd.</i> 0 <i>ft.</i> 1 <i>in.</i>
	{ Cost	-	-	-	7½ <i>d.</i>
Price	-	-	-	-	1,151 <i>l.</i> 15 <i>s.</i> * No experience.
Ordinary repairs	-	-	-	-	12 <i>l.</i> 13 <i>s.</i> 6 <i>d.</i>
Dioptric.	Oil	{ Consumption	-	-	5 <i>gals.</i> 2 <i>qrs.</i>
		{ Cost	-	-	18 <i>s.</i> 4 <i>d.</i>
2nd order.	Wicks	{ Consumption	-	-	2 <i>ft.</i> 1½ <i>in.</i>
		{ Cost	-	-	4½ <i>d.</i>
Dioptric.	Price	-	-	-	81 <i>l.</i> 18 <i>s.</i> 4 <i>d.</i> †
5th order.	Price	-	-	-	Fixed. Not new; adapted from part of an experimental apparatus.
Dioptric.	Ordinary repairs	-	-	-	1 <i>l.</i> 17 <i>s.</i> 11 <i>d.</i>
		-	-	-	2 <i>qrs.</i> 1½ <i>pts.</i>
6th order.	Oil	{ Consumption	-	-	2 <i>qrs.</i> 1½ <i>pts.</i>
		{ Cost	-	-	2 <i>s.</i> 2½ <i>d.</i>
Wicks	{ Consumption	-	-	-	1½ <i>wick.</i>
	{ Cost	-	-	-	3½ <i>d.</i>
Price	-	-	-	-	Revolving* 910 <i>l.</i>
Ordinary repairs	-	-	-	-	17 <i>l.</i> 16 <i>s.</i> 1 <i>d.</i>
Oil	{ Consumption	-	-	-	22 <i>gals.</i> 3 <i>qrs.</i>
	{ Cost	-	-	-	3 <i>l.</i> 15 <i>s.</i> 10 <i>d.</i>
30 burners‡	Wicks	{ Consumption	-	-	3 <i>doz.</i> 4½ <i>doz.</i>
		{ Cost	-	-	8½ <i>d.</i>
Price	-	-	-	-	Fixed, 150 <i>l.</i> * No experience.
Ordinary repairs	-	-	-	-	11 <i>l.</i> 4 <i>s.</i>
Oil	{ Consumption	-	-	-	15 <i>gals.</i>
	{ Cost	-	-	-	2 <i>l.</i> 10 <i>s.</i>
Wicks	{ Consumption	-	-	-	3 <i>doz.</i>
	{ Cost	-	-	-	7½ <i>d.</i>
Dioptric.	Price	-	-	-	Revolving 610 <i>l.</i> * No experience.
18 burners‡	Ordinary repairs	-	-	-	13 <i>l.</i> 13 <i>s.</i>
Oil	{ Consumption	-	-	-	16 <i>gals.</i> 3 <i>qrs.</i> 1 <i>pt.</i>
	{ Cost	-	-	-	2 <i>l.</i> 16 <i>s.</i> 3 <i>d.</i>
Wicks	{ Consumption	-	-	-	2 <i>doz.</i> 8½ <i>doz.</i>
	{ Cost	-	-	-	7½ <i>d.</i>

XI. The stores usually supplied by public advertisement are oil, the London supply of coals, cordage, canvass, and ship chandlery. Those procured by competition from several well-known firms are provisions, paints, white lead, soap, tallow, and olive oil, packing cases, coals for districts, uniform clothing, cleaning stores, &c. Chain cables of special manufacture are supplied upon an annual price list by Messrs. Lenox, and lighting stores also upon a price list by Messrs. Wilkins. The oil is tested by comparison with that of the previous year which has been found of good quality. Chain cables are tested by hydraulic pressure at Messrs. Lenox's, under the superintendence of the Light Committee; other stores by comparison with samples or with previous stock.

XII. Experiments are still in progress with a view of more general adoption of fog signals at lighthouses. Bells are at present used in preference to gongs, and are placed in positions where they can most readily be heard.

XIII. Not in use, except at Bideford, for which see Special Return.

* The "Ordinary Repairs" include charges for ventilating apparatus, the tubes of which require frequent repair.
† At the Spurn Low Light (the only light of this class), the charges being included in those for High Light, separate expense cannot be accurately stated.
‡ These have been given as examples; other catoptric lights have different numbers of burners.

ENGLAND.

Circular II.
Question
XIV.

XIV.

XIV. Nature and dates of any memorials or application for lighthouses on new or old sites, since January 1845, and nature and dates of replies :—

STATIONS IN ENGLAND AND WALES.

1845.

Light on Worms Head.

April.—The Mayor, &c. Carmarthen, proposing one.

The Helwicks lightvessel placed instead, with entire concurrence of memorialists.

1846.

Beumaris Pier.

June.—Council of Borough, requesting sanction for light.

Accorded.

River Ribble.

June.—Directors of Navigation, requesting sanction for light.

Accorded.

Lowestoft Harbour.

July.—Norfolk Railway and Lowestoft Harbour Company, requesting sanction for light.

Accorded.

Banks of Thames, from Woolwich to Nore.

September.—G. M. Goodwin, reverting to proposal made in 1844, for lighting the Thames by means of masked reflectors placed at each angle.

Acquainted that it has been laid before the Board.

Ports of Portsmouth and Milford.

October, January 1849, and March 1852.—G. M. Goodwin, that copy of plans have been transmitted to Admiralty (for lighting by means of masked reflectors).

Receipt acknowledged.

Eastbourne Harbour.

November.—Collector of H. M. Customs, Rye, that it is proposed to erect a light.

Particulars requested.

November.—Mr. W. R. Row, that it is to be a guide for fishing vessels.

Sanctioned.

1857, March.—Clerk of Lighting Inspectors, proposing red coloured lamp at seaside for fishermen.

Have no objection to coloured lamp, but that at Hastings being red, this had better be green.

Newbiggen.

December.—Earl Grey, forwarding memorial from fishermen thereat for a light on Newbiggen Point.

Not considered necessary for general trade, but application for sanction for light will receive consideration.

1847.

Studland Bay, Light on Old Harry.

February.—Collector of H. M. Customs, Southampton, with letter from Mr. J. Goodridge, whose views are concurred in by Mr. Geo. Babot, both being master mariners of long standing, recommending light.

Referred to Committee, who do not recommend its being done.

1860, February.—H. D. Seymour, M.P., with memorial from merchants of Poole for light on or near Durleston Head.

That light in that position must be regarded as a local light, but that Corporation would not offer objection to its exhibition, if placed and maintained by local authorities.

West Hartlepool Harbour.

March.—Dock and Harbour Company, requesting sanction to light.

April.—Bell and Company, furnishing particulars.

Sanctioned.

Blyth Harbour.

March.—Treasury, with representation from Mr. John Stephenson, Pilot at Blyth, as to want of standing light in harbour,
Acknowledged.

LIGHOUSES.—GENERAL RETURN.

XIV.

Folkestone Harbour.

May.—South Eastern Railway Company, requesting sanction for light.

Accorded.

River Lune.

August.—Commissioners of St. George's Quay Lancaster, requesting sanction to light.

Accorded.

Blyth Sand.

October.—Masters of vessels and others, requesting that small light may be placed thereat.

Light ultimately placed on the Chapman.

Fowey Harbour.

November.—Collector of H. M. Customs, that nautical men consider light would be advantageous.

Requested to state how light can be maintained.

1848, June.—Inhabitants of Fowey, requesting that light may be placed thereat.

Requested to state how light can be maintained.

Warkworth Harbour.

November.—Commissioners thereof, requesting sanction to light.

Sanctioned.

Pile Harbour, Lancashire.

November.—Messrs. Nelson and Wynn, requesting sanction to light.

Sanctioned.

1848.

Poole Harbour.

May.—Corporation of the Borough, requesting sanction to light.

Sanctioned.

Littlehampton Pier.

July.—Harbour Commissioners, requesting sanction to light.

Sanctioned.

1850.

Morte Rock.

March.—Lloyd's, forwarding representations in favour of light thereon.

If general trade express wish for light, measures will be taken for its establishment. Buoy subsequently placed.

Forwarded to Admiralty, with observation that two leading lights would appear to be most effectual. (Lightvessel at the Warner ultimately placed.)

Tongue and Goodwin Sands.

April.—T. P. Jordenon, St. Mary-at-Hill, proposing a lighthouse on each of those sands.

Receipt acknowledged.

1851.

Bishop Rock.

January.—C. Moyle, C.E., to place a light in the lower part of the lighthouse at St. Agnes, and reflect it on the Bishop Rock, or to build a small lighthouse on the nearest island sufficiently high as to appear at the same elevation as that of St. Agnes when at two cables' lengths from the Rock.

Accompanied that Corporation; resolved some months since to erect a lighthouse of stone on the Bishop Rock, and that works have been commenced.

Dover Pier.

April.—Town Clerk, requesting sanction to light.

Accorded.

1853.

Breakwater Light.

November.—Mr. L. C. Bailey, R.N., suggesting additional lights, white and green, to lead vessels clear of the Knap, Panther, and Draystone.

A single bright light was placed so as to open immediately on passing the Draystone buoy from the west, and the buoy of the Knap from the east.

Kicker Gill (Warner).

November.—Sub-Commissioners, Portsmouth, with enclosure from Mr. J. Main, pilot, proposing light on the Kicker Gill, or some convenient spot near, as a guide between the Horse Sand and the Warner.

XIV

LIGHTHOUSES.—GENERAL RETURN.

XIV.

ENGLAND.
Circular II.
Question
XIV.

1854.

Llanely Harbour.

March.—Harbour Commissioners, requesting sanction to light on Whitford Sker.
Accorded.

Whitby.

April.—Shipowners at Dundee, Sunderland, and Hartlepool.

May.—Shipowners at Scarbro' and Shields,—recommending light.

Two lights placed.

St. Ives Bay, Stones, Godrevy.

Shipowners, &c., at Barnstaple, Cardiff, Hayle, St. Agnes, St. Ives, St. Mawes, Truro, Waterford Chamber of Commerce.

The Trinity House put themselves into communication with the Board of Trade; an abstract of consequent correspondence is given in answer to Question XVII., and the correspondence itself is set forth in a Parliamentary Paper printed by order of the House of Commons, 8th February 1858.

1856.

Whitby Pier.

February.—Harbour Trustees, recommending that light should be maintained as a general light until proposed lights at High Whitby are established.

Are disposed to comply.

March.—Board of Trade decline to sanction necessary expense.

1857.

St. Alban's Head.

February.—Mr. G. Biddlecombe, R.N., recommending light on Anvil Point, and small lighthouse on Grove Point, Portland, instead of light at Shambles.

Hoped that New Needles may be made available (which has been satisfactorily done).

March.—G. A. Ackers, Esq., recommending light on Anvil Point, and that Old Needles Light should continue to be shown after new one is lighted.

Hoped that New Needles may be made to answer purposes he has in view.

Doubts the New Needles being sufficient.

Penzance Pier.

June.—Town Council, that exhibition should be for all night instead of as at present, when there is only 15 feet water, and that green shade be substituted for red one when the depth of water is less than 15 feet.

Sanctioned.

Bullslaughter Bay.

September.—Rev. W. Allen, recommending light.

Caldy and St. Ann's Lights considered sufficient.

Redcar.

October.—Board of Trade, forwarding letter from the Earl of Zetland recommending light.

Consider that two green lights would be beneficial, and that we see no objection to their exhibition accordingly.

Swansea Harbour.

December.—Trustees, that red light used at the Swivel Bridge only when passage is clear shall be altered to green light when passage is clear and bright red when obstructed.

See no objection, and sanction accordingly.

1858.

Saundersfoot Harbour.

February.—Harbour Master, to exhibit red light at Pier Head in lieu of white one, liable to be mistaken for those in dwellings.

Entirely concur, and sanction accordingly.

Needles and Harst.

June.—Lieut. Hay, R.N., to mark the channel between Warden Ledge and the Shingles by means of blue light from New Needles, and green from High Tower at Hurst.

Acquainted that in judgment of Elder Brethren the light from the Needles, as intended by them, will be sufficient for all practical purposes.

Manacles.

September.—Com. Lory, R.N., recommending light thereon.

October.—Acquainted that, having regard to the vicinity of Lizard and Falmouth Harbour Lights, a lighthouse on the Manacles would be of doubtful expediency, but that experiments are in progress for suitable fog bells, to be applied at various points round the coasts.

1859, October.—Com. Lory, R.N., calls attention to a wreck which might have been avoided had there been a light on the Manacles or the point within.

Acquainted that the Elder Brethren see no reason to alter opinion expressed in October 1858, that the buoy at the Manacles has been recently increased in size, and that having regard to the recent occurrence of the American Ship "Quebec," running in broad daylight on the Eddystone Rock, they are apprehensive that no lighthouse would be effective in counteracting the carelessness displayed by some masters of vessels.

Sheerness, Garrison Point.

November.—Proposal for light.
Concurred in.

Weymouth Harbour Light.

November.—Mayor and Town Council, that light will be discontinued a short time owing to unavoidable accident.

Trust that special care will be taken to exhibit an efficient light in substitution during discontinuance.

Lyme Harbour.

August.—Authorities propose to remove green glass lamp, and place one having a green bull's eye on a plain white ground.

See no objection.

1859, May.—Found not to be an improvement; propose further alteration by placing red bull's eye in room of present green one.

See no objection.

1859.

Carnarvon Harbour.

April.—Harbour Trustees, that they intend to discontinue light.

Requested to state circumstances under which they do so.

May.—Harbour Trustees, that although the light is of general utility, their funds are not sufficient for its maintenance.

Sanction to its discontinuance declined.

June.—Harbour Trustees, requesting further consideration, or that Corporation will take the light.

Light being of local character, cannot properly accept surrender; recommended to apply to Parliament for increase of toll.

July.—Harbour Trustees, representing impediments which exist in applying to Parliament, and expressing hope that measures may be adopted to relieve them of burthen.

Sanction to extinction still withheld; recommended to apply to Board of Trade for satisfactory arrangement of the matter.

STATIONS IN SCOTLAND.

Caitness Coast.

In 1841, the Northern Commissioners had transmitted memorials, &c. for a light on Caitness Coast, and had suggested Sarclett Head. Correspondence ensued; and in 1845 they were advised that the Elder Brethren had examined the locality, and that Noss Head was considered to present the most advantageous site.

1845, May.—Northern Commissioners state that they have appealed to the Privy Council against Noss Head.

Receipt acknowledged.

November.—Northern Commissioners informed that their appeal has been referred to Elder Brethren for report, and copy of said report sent to them.

1846, February.—Northern Commissioners, that Privy Council have directed light to be erected on Noss Head, assume that under circumstances it is not necessary to ask sanction of Corporation.

Trinity House.—Sanction not requisite, but

character of light when determined on should be submitted.

June.—Northern Commissioners request sanction as to particular site and character.

July.—Trinity House.—Approve site; suggest reconsideration as to colour.

Offer to meet Mr. Stevenson at Edinburgh thereon.

October.—Concur in final proposal for revolving light without colour.

1845.

Ardnamurchan.

March.—Northern Commissioners, requesting sanction to light.

May.—Trinity House.—Will inspect.

October.—Sanction.

Cairn Ryan.

July.—Northern Commissioners, proposing to convert beacon into light.

October.—Sanction.

1846.

Coveeen Skerries, Moray Firth.

March.—Northern Commissioners propose introducing red colour on certain bearing.

Trinity House.—Have no objection to offer.

Start Point of Sandy, Orkneys.

March.—Northern Commissioners propose to raise it about 50 feet, and fit improved apparatus.

April.—Approval communicated.

Hoy Sound.

May.—John Robertson, Esq., recommending light therein.

(referred to Northern Commissioners.)

October.—Northern Commissioners propose to erect light on Græmsay.

December.—Sanction given, and to additional light at Clestron to act as a leading light.

Kyleakin.

(See Sound of Skye in 1853.)

October.—Northern Commissioners, requesting sanction to light.

Devaar.

October.—Northern Commissioners, requesting sanction to light.

December.—Granted.

Lochindaal, Islay.

October.—Northern Commissioners, proposing light thereat.

1847, September.—Approved, and recommended that the light should show red in the direction of Laggan Point instead of being masked.

Sanna.

October.—Northern Commissioners, proposing light thereat.

November.—Trinity House.—Removal of Mull of Kintyre light not to be pressed if Sanna be built.

December.—Sanction to Sanna.

1847.

Langness Point, Isle of Man.

October.—Admiralty, transmitting documents in favour of light thereon.

Lights at Calf of Man and at Douglass considered sufficient to avoid dangers off that point.

1848.

North Ronaldshay, Dennissness.

March.—Northern Commissioners, requesting sanction to light, and propose to suspend works at Start, Sandy.

April.—Granted; inquire as to apparatus.

1850.

Arnish Point, entrance to Stornoway.

November.—Northern Commissioners, requesting sanction to light.

November.—Granted.

1852, January.—Northern Commissioners, requesting sanction as to character.

Granted.

1851.

Whalsey, Shetland.

November.—Northern Commissioners, requesting sanction to light on Bound Skerry.

Granted.

1852, November.—Northern Commissioners find that Bound Skerry is very much exposed to assaults of waves, which occasionally pass completely over it. That rock exhibits in some parts proofs of rapid and very recent disintegration, that there would be risk of tower being injured by masses of rock which the sea is frequently detaching and scattering about, and therefore propose change of site to Islet of Gruna.

The season being unfavourable for personal inspection on the spot, and the Elder Brethren being unwilling to be the cause of further delay in proceeding with a lighthouse where one was so urgently needed, and relying on the statement of the Commissioners, were induced to concur in the proposed change.

1854, March.—Northern Commissioners propose temporary light on Bound Skerry during ensuing winter.

April.—Trinity House concur.

July.—A visiting committee of the Elder Brethren inspect the locality, find Bound Skerry in every way eligible for erection of lighthouse, that the sphere which would be illuminated from it seaward to the northward and southward would be much more extensive than from Gruna, (273 against 207,) and that the outer danger, as also the long stretch of foul ground extending from the coast in that immediate locality, would be effectually covered by a light on the outer or Bound Skerry, and not by that proposed on Gruna. A protected site was found a short distance west of the centre of the Skerry, and the sea between it and Gruna observed to be so landlocked as to leave no doubt of the possibility of frequent communication. Under these circumstances, the Elder Brethren could not hesitate as to their duty, but revoked consent given for Gruna in November 1852, and decided on Outer Skerry, on which the lighthouse has since been built.

1853.

Port Gordon.

July.—The Duke of Richmond, forwarding letter from Mr. Balmer expressing wish of fishermen to place two lanterns in line with entrance to harbour.

Informed that controlling power is with Northern Commissioners, and that letter and note have been forwarded to them.

In December 1853, the Northern Commissioners submitted proposals for eight lights at or near Tobermory, Bressay, Cantick Head, Rona, Sound of Skye, Stour Head, Sound of Islay, and Thurso Bay. The Trinity House inquired as to tonnage likely to be liable to tolls, and in January 1854 were of opinion that lights at Tobermory, Bressay, Skye, Islay, and Thurso should be treated as local lights, and that light on Rona might be superfluous if first-class light for Stour Head or Rhu Rhea were placed on the latter headland. The sites were visited in July 1854.

Tobermory, in Mull.

December.—Northern Commissioners. A small light near Tobermory in Mull, to indicate the northern entrance to the Sound of Mull, and at the same time, as far as practicable, to show through the Sound, and open the bay and anchorage of Tobermory.

1854, August.—Elder Brethren of opinion that light should be on outlying north-east point of Mull.

1857, February.—Northern Commissioners send suggestion of Commander Bedford to Board of Trade that green light should extend over arc, including the whole of the rocks between Tobermory and Loch Sanart.

Entirely concur as to range, but unless special reasons exist, think light should be deep red.

(When the Elder Brethren offered this suggestion they had not been apprized by the Northern Commissioners of the character which it had been determined to give the light towards the western entrance of the sound.)

Bressay, in Shetland.

December.—Northern Commissioners, for a small light in the Sound, to open up the entrance to the valuable refuge and anchorage of Lerwick.

1854, August.—Trinity House.—That light should be placed on outermost point of Kirkabisterness.

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Cantick Head.

December.—Northern Commissioners, for a light on Cantick Head or Switha Island, Orkney, to indicate the entrance to the anchorage of Longhope and the entrance to Scapa Flow.

1854, August.—Trinity House.—That light should be on Cantick Head in preference to Switha Head.

Rona.

December.—Northern Commissioners, for a small light on northern extremity to open up the Sound of Applecross.

1854, August.—Concur.

Sound of Skye.

December.—Northern Commissioners, for a small light to guide vessels through the southern portion of the Sound of Skye, after losing Ardnamurchan.

1854, August.—Trinity House.—That light should be on extreme point seaward of Isle of Gillian; recommend also for this locality a light on Oronsa, one on Ushenish, and that the beacon on Collochstone Rock be enlarged.

Stour Head or Rhu Rhea.

December.—Northern Commissioners, for a first-class light on Stour Head or Rhu Rhea as may be afterwards resolved on.

1854, August.—Trinity House, That light should be a general passing light on Rhu Rhea, if the trade will bear it, making Oronsa a local light, and with no need for Stour Head.

Board of Trade inquire as to placing this light so as to open up Loch Broom.

1857, June.—Elder Brethren select South Ear, Stour Head.

1860, January.—Northern Commissioners, as to character of Stour Head relatively to Butt of Lewis.

When character of Stour Head is under consideration, the Elder Brethren will give observations attentive consideration.

Sound of Islay.

December.—Northern Commissioners, for a first-class light at or near Port Askaig in the Sound of Islay, to light up that Sound fully, both as to north and south.

1854, August.—Trinity House, That light would be seen when vessel is fairly in the entrance or abreast of it to the northward, yet it would not guide a vessel to the entrance, and that its usefulness to vessels entering the Sound from the southward would be still more circumscribed, say to less than 4 degrees.

Elder Brethren, think light should be on Rhu Vaal, as useful in guiding vessels to entrance from the northward, and in leading to an anchorage in Sound, if wind were well to westward or southward. Regard southern entrance as almost too dangerous to be taken at night, and that single light would scarcely be sufficient.

November.—Northern Commissioners forward letter, &c. from Commander Bedford demurring to site, and suggesting comparison with Carrig More.

1855, June.—Board of Trade transmit letter from Commander Bedford.

July.—Views of Trinity House, as above, explained to Board of Trade.

1856, July.—Board of Trade transmit letter from Admiralty, with enclosure from Commander Bedford and others relative to change of site from Rhu Vaal.

Opinions expressed by Trinity House in July 1855 reiterated.

1857, February.—Trinity House and Board of Trade concur that light should be fixed.

July.—Trinity House determine that light should be white to N.E., and south as a *guide* for navigation of Sound of Islay, and visible to westward as a *warning* to keep off the dangers abreast of Colonsay and Oronsay, and coloured red only in direction of east coast of Colonsay and Oronsay, with a view of warning vessels approaching too near those islands when bound through the Sound of Islay.

Northern Commissioners of opinion that this white light to the westward will not be understood

as a warning light, and should be red, or masked altogether.

1858, October.—Board of Trade transmit correspondence with Northern Commissioners and copy of proposed notice to mariners, with request that we will insert sailing directions, and transmitting also paragraph suggested by Captain Sullivan, relative to opening passage between Islay and Oronsay.

Elder Brethren, having regard to dangers, and in absence of distinctive character, are not prepared to recommend that masters of vessels should, under any circumstances, take a course defined by compass bearings alone between Islay and Oronsay in the night season. Sailing directions prepared.

Northern Commissioners consider modification of sailing directions necessary, in consequence of light being seen over low part of Oronsay.

Modification made.

Subsequently to this the Northern Commissioners have called attention to the inconvenience and liability to error from the red light showing over the low parts of Oronsay, and Commander Bedford represented danger to a vessel from misconception of character and intention of light.

Elder Brethren suggested fresh issue of sailing directions. Again inspected in summer of 1859, and determined that the red light, which used to show over the low part of Oronsay, should be masked.

Thurso Bay, Holburn Head.

December.—Northern Commissioners, for a light of small size for Thurso Bay, to lead to the proper anchorage in Scabster Roads.

1854, August.—Trinity House, That light should be a local one, inside Holburn Head.

1857, January.—Northern Commissioners formal proposal.

February.—Sanctioned.

1858, April.—Northern Commissioners propose that character should be fixed, colour green.

Trinity House advert to previous opinion of Northern Commissioners, that flashing light would be more suitable, consider it should be a white flashing light.

North Uist, Muckle Flugga.

The question of a light either in the neighbourhood of North Uist or of Whalsey Skerries had been under consideration at a time when it was proposed to place only one light on the north of east of Shetland, but in

1854, March.—The Board of Trade forwarded letter from Admiralty, urging the erection of two, and the placing of temporary lights meanwhile.

In July the site was visited. Lambaces had been preferred by the Northern Commissioners, their engineer stating on one occasion that it was not practicable to erect and maintain a lighthouse on the Muckle Flugga, although Mr. A. Stevenson, his predecessor, appears to have reported on four several occasions in its favour, as the site most proper for the general purposes of navigation, and deserving of the first consideration.

The Commissioners had also considered that a light on Muckle Flugga would also have the effect of drawing vessels injuriously to the southward, but the Elder Brethren observed that the wind during a large proportion of the year prevails from the westward; that under such circumstances ships would do well to keep to the windward, and that the light on Flugga would enable them to do so; that there were no engineering difficulties greater to contend with than those which have been already overcome by the improved skill of the present day, and that Flugga being the great landfall for vessels from the north, the north-west, and the north-east, and being the northernmost danger (with the exception of the stack lying a short distance off), should be taken as the most important and prominent site for a light.

1854.

Start Point.

March.—Northern Commissioners, to alter character of light from revolving to fixed bright when intended revolving light at North Ronaldshay is in operation.

April.—Concur.

1857.

Sound of Islay, Southern End.

January.—Northern Commissioners transmit copy of communication made to Board of Trade relative to light at south end of Islay, and to lighting Sound of Jura.

Trinity House. Think that single light will not be available for both Sounds, and would sanction light on Black Rocks for Islay.

Islay visited in course of summer, and Black Rocks found so difficult that McArthur's Head was preferred.

1859, March.—Northern Commissioners propose as character for McArthur's Head a revolving 2nd order.

Elder Brethren prefer fixed 2nd order.

Northern Commissioners reply.

Elder Brethren will postpone decision until visit.

September.—Elder Brethren suggest application of principle in use at Oronsay.

1860, January.—Northern Commissioners send plan.

Elder Brethren approve it.

Sound of Jura.

1857, February.—Northern Commissioners, recommending Rhuadsgier and Goat Island for sites.

May.—Northern Commissioners request sanction.

June.—Elder Brethren consider Skervoile preferable to Goat Island, and that Rhuadsgier is less urgently required.

1859, March.—Northern Commissioners propose fixed 3rd order for Skervoile.

July.—Elder Brethren concur, but light to show red southward of rock. (Sent in April, but miscarried.)

Phladda or Bladda.

May.—Northern Commissioners for sanction.

June.—Elder Brethren concur.

1859, January.—Northern Commissioners as to character.

February.—Elder Brethren, that Board of Trade suggest arc of red light.

Northern Commissioners think additional arc, if at all, should be green.

March.—Elder Brethren concur with Board of Trade.

Caledonian Canal.

February.—Board of Trade suggest light.

Sent to Northern Commissioners.

Corran.

May.—Northern Commissioners recommend Corran Point.

Sanctioned.

1859, January.—Northern Commissioners request sanction to character.

February.—Informed that Board of Trade suggest extension of bright light to northward.

Northern Commissioners adhere to original view.

March.—Trinity House concur with Northern Commissioners.

Butt of Lewis.

February.—Board of Trade, with correspondence with Northern Commissioners.

Elder Brethren, having regard to works in progress, postpone consideration for the present. Subsequently sanctioned.

May.—Northern Commissioners for sanction.

1860, January.—Elder Brethren, that character should be fixed bright.

Northern Commissioners, that it should be revolving.

February.—Elder Brethren see no reason to alter.

1858.

Ushenish.

January.—Northern Commissioners propose extension of arc upon that originally arranged to full extent of lie of shore, both north and south.

Elder Brethren approve range extending to $\frac{1}{2}$ miles of outlying danger on south coast; would not have concurred as to red colour, if character had been originally submitted, agreeably with requirement of 17 and 18 Vict. c. 104.

Frith of Forth.

February.—Board of Trade request opinion as to proposal of Northern Commissioners for lights on St. Abb's Head and Fifeness.

Elder Brethren consider light on St. Abb's Head desirable; as regards Fifeness, are not prepared to notify approval.

Northern Commissioners forward application from General Steam Navigation Company for light on St. Abb's Head.

May.—Trinity House, Sanction light on St. Abb's Head after visit to site.

1859.

Hebrides.

February.—Board of Trade forward correspondence with Northern Commissioners.

Elder Brethren visit sites, select westernmost of Monach Group.

October.—Northern Commissioners decline to express opinion on site selected.

Elder Brethren suggest that Monach should be quick revolving, Barra Head changed to a fixed bright light, and Butt of Lewis fixed bright.

November.—Board of Trade with correspondence. Northern Commissioners have resolved to build on westernmost of Monach Group.

1860, January.—Elder Brethren sanction Monach, both as to site and character; deem it unadvisable to alter Barra Head at present.

STATIONS IN IRELAND.

1846.

Cable Island.

January.—W. C. Morgan, forwarding two memorials from Cork for lighthouse thereon. Referred to Irish Board.

Irish Board, that inspector considers that Cable Island would not be the best situation, but that if Elder Brethren continue to prefer it will proceed.

Acquainted that Elder Brethren do so.

March.—Irish Board concur on full consideration, and request sanction.

April.—Accorded.

1847, April.—Board of Trade, that Captain Denham considers Ballycotton the most eligible site.

Acquainted that Cable Island is considered preferable.

November.—Admiralty, forwarding approval of site (Cable Island) from Admiral Beaufort, Commanders Wolfe and Fraser, and the Ballast Board of Cork. See 1848, *Ballycotton and Minehead.*

Cape Clear and Old Head of Kinsale.

February.—Irish Board advert to observations of Elder Brethren in 1844, propose to alter sites.

Elder Brethren entirely approve.

Dingle Harbour.

September.—John Hickson, Esq., recommending light thereat.

Referred to Irish Board.

Dundalk Harbour.

October.—Irish Board, requesting sanction to two small lights.

November.—Granted, if expenses are defrayed from local revenues.

1847, February.—Irish Board, further as to sanction.

Sanction confirmed, toll being only chargeable on local trade of port.

1847.

Beeres Rock.

February.—Irish Board, requesting sanction to light.

Accorded.

Rathlin Island.

March.—Irish Board, requesting sanction to light.

Trinity House, Advert to previous discussion with reference to relative importance of light on Rathlin Island, and those on Mull of Cantyre, &c.

1852, July.—Trinity House inquire as to character, on account of Devaar.

August.—Irish Board propose that it should be intermittent.

Elder Brethren concur, but suggest a fixed light below, in the same tower.

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September.—Irish Board transmit report from Engineer.

Trinity House adhere to original opinion.

Glascarrick Point.

April.—Editor of "Liverpool Mercury," calling attention to "Brief Notes" therein, proposing a light.

Sent to Irish Board.

June.—Irish Board reply, suggesting two buoys on outer edge of Blackwater Bank.

Elder Brethren concur and sanction.

Fastnett Rock.

December.—Irish Board propose to place light thereon, in lieu of south-west Point of Capc Clear.

Elder Brethren inquire for further particulars.

1848, January.—Elder Brethren send sanction.

1848.

Tralee Bay.

January.—Irish Board, requesting sanction to light on Saphire Island.

Elder Brethren will sanction if harbour light or lights.

March.—Harbour light sanctioned.

Ballycotton, Minehead.

March.—Irish Board forward letter from Admiralty, that two lights are necessary between Hook Tower and Old Head of Kinsale, and memorials in favour thereof.

Elder Brethren consider that one light only would be best placed on Cable Island, but that now two lights are proposed, Ballycotton and Minehead are the best situations; sanction granted accordingly.

1850, April.—Irish Board as to character, propose that Ballycotton should be flashing, Minehead intermittent.

May.—Elder Brethren concur if distinction be accurately marked; inquire further.

June.—Irish Board explain details.

Elder Brethren approve.

April.—Shipowners, &c., Liverpool, T. C. Anstey, M.P.

Acquainted with the arrangement which had been sanctioned above.

Youghal Harbour.

March.—Irish Board, requesting sanction to light. Harbour light sanctioned.

Lights on South Coast.

April.—Trinity House sends memorials from Liverpool and Youghal.

May.—Irish Board thereon.

Trinity House inquire further.

Broadhaven Harbour.

July.—Irish Board, requesting sanction to light.

August.—Trinity House inquire further.

1850.

Galley Head.

Jan.—Irish Board, requesting sanction to light.

Not considered by Trinity House that an additional coast light is necessary; would not object if expense be local.

April.—Lord Bernard, forwarding recommendation from Grand Jury of Cork County for light.

Above opinion forwarded.

July.—Lord Bernard, forwarding recommendation from Grand Jury of Cork County for light.

Above opinion forwarded.

1857, March.—Irish Board renew application.

Trinity House reply as before.

Galway Bay.

January.—Irish Board propose light on Inishere Island and on Rock Island, and to discontinue that on Arran Island.

Suggested by Trinity House whether it would not be desirable to defer proposed erection on Rock Island, and confine operations to light on Inishere Island, and retain Arran Light; but if Irish Board consider both lights should be proceeded with, sanction will not be withheld.

February.—Irish Board concur in suggestion.

1853.

Rock-a-Bill.

October.—Irish Board advert to previous correspondence in 1838, request sanction to light.

November.—Accorded, provided tolls for Balbriggan Light become local.

In March 1859, the character of the Rock-a-Bill Lighthouse came under consideration, and it was determined that it should be quick, flashing, bright to seaward, red to westward between Cloger Head and Bailey Head, and consequent thereon that the fore and mizen lanterns of the Kish should be lowered; no alteration in Carlingford or in Howth Bailey, but St. John's Point to be changed from bright to red, to render it more distinct from South Rock.

A letter was received from the Board of Trade, suggesting that the Kish should be made a single revolving light instead of lowering the lanterns; and that the period of revolution at St. John's should be altered instead of making it a red light. A copy of this letter was sent to the Irish Board, with an intimation that the Elder Brethren see no reason to alter their expressed views.

1854.

Straw Island.

November.—Board of Trade inquire as to utility of proposed small harbour light.

Trinity House.—That it would facilitate entrance to Killcany Bay and Gregory's Sound, and would be advantageous to fisheries; is to be regarded as alone for the purposes of the locality.

1857.

South-west Coast.

March.—Irish Board propose to erect lights on Galley Head, Bull and Foze, and Black Rock.

April.—Trinity House.—Will sanction Bull and Foze, if in substitution for Skelligs and Black Rock or Achill Island.

June.—Sanction "Bull" if Skelligs be discontinued; "Calf," if they remain; sanction Foze; sanction Black Rock, Achill Head being too far to the eastward.

Hook Tower, Waterford.

July.—Irish Board propose to paint top red.

Concur.

1859.

Spit Bank, Cork Harbour.

March.—Irish Board propose increase of power, &c.

Concur as to power; character should not be further altered by addition of flashes, as had been suggested.

Crookhaven.

March.—Irish Board propose to colour arc over Alderman Rock red.

Concur.

Mutton Island, Galway.

May.—Irish Board to show a lower light coloured red, to indicate channel between Black Rock and Margaretta Bank.

Concur; afterwards advise that Board of Trade cannot allow charge on Mercantile Marine Fund.

Light on Cahore Point. See Blackwater Bank Lightvessel.

Arranmore.

July.—Irish Board request sanction to re-lighting.

Elder Brethren inquire as to character.

October.—Irish Board propose single flashing, and that Rathline O'Erne be changed from flashing to single fixed.

November.—Elder Brethren concur.

Spit of Passage, Waterford.

December.—Irish Board, requesting sanction to light.

Elder Brethren do not consider it of such general advantage as to justify their forwarding proposal for sanction of Board of Trade.

Copeland Island Light, &c.

December.—Irish Board propose removal.

Elder Brethren cannot pronounce opinion until after visit.

STATIONS IN THE CHANNEL ISLANDS.

1846.

Guernsey.

January.—Mr. Sadler, recommending light thereat.

February.—Acquainted that proceedings will be taken in relation thereto on receiving requisition from trade.

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March.—Chamber of Commerce, stating that no light is required.

Mr. Sadler, further recommending light.

Both acquainted that Corporation decline taking further steps therein.

Mr. Sadler, forwarding copy of letter he has addressed to Chamber of Commerce.

Acknowledged.

Mutual Insurance Society, contradicting statements made by Mr. Sadler.

Acknowledged.

June.—Mr. Sadler, with opinion of Rev. D. Dobree, Rector of Tortoval, as to advantage of light.

Trinity House reply that when application for light is made by shipping interest, consideration of subject will be resumed.

1847, May.—Mr. Sadler, with memorial from certain shipowners, praying establishment of light. Governor of Island communicated with hereon.

September.—Mr. Sadler, further recommending light.

Acquainted Committee had visited Island, and find opposition to light continues.

1848, February.—Mr. Sadler, calling attention to wreck of the "Emanuel."

March.—Mr. Sadler, calling attention to wreck of the "Five Sisters."

Copies forwarded to parties who object to light. Mutual Insurance Society, that light would be of service to coasting trade.

April.—Chamber of Commerce, still objecting to light.

Mr. W. Wilson, referring to loss of the "Nabob."

Lloyd's requested to furnish particulars in relation to this wreck.

May.—Lloyd's furnish particulars.

Attention of Lieut.-Governor directed to these representations, and inquiry made whether there would be any objection to a moderate charge for the expenses of a light.

June.—Lieut.-Governor, transmitting resolution of Chamber of Commerce objecting to light.

Mr. Sadler, advocating exhibition of light.

Rev. D. Dobree, suggesting that Tortoval Church steeple be appropriated for light.

July.—Lieut.-Governor, transmitting resolution of Chamber of Commerce expressing conditional approval.

Opinion of counsel to be obtained in relation to powers of Corporation to erect lights on Channel Islands.

October.—Lieut.-Governor, transmitting papers from Mr. Sadler and others in favour of light.

November.—Mr. Sadler, forwarding copy of memorial to Corporation sent in 1846, in relation to security vessels would derive from light.

Counsel (Mr. Robinson) of opinion that Corporation have no power at present to erect light-houses on the Channel Islands.

Counsel's opinion to be forwarded to Mr. Sadler.

Mr. Sadler, urging that measures may be taken by those who have authority for exhibition of light.

Lords of H.M. Treasury to be addressed on the subject.

1849, January, Mr. C. Crespinal, representing want of light.

Acquainted with the powers of the Corporation.

February.—Treasury have forwarded communication to Sir George Grey, with a request that he will address Lieut.-Governor thereon.

April.—Treasury are prepared to receive suggestions in relation to light.

Informed that Elder Brethren concur in opinion that light is necessary, but that Corporation have no power at present to erect it. Referred to erection of lights at Gibraltar and Heligoland.

October.—Board of Trade, forwarding copy of letter addressed by Mr. Sadler to Mr. Labouchere, consider arrangements more properly rest with Treasury.

Copy to be forwarded to the Treasury, and inquiry made whether their Lordships contemplate the adoption of any measures for the erection of light.

December.—Lieut.-Governor inquires whether collection of tolls in Guernsey for light thereat would be likely to lead to liability for lights which may hereafter be erected on the British side of the channel.

Acquainted that Board has no intention or wish that it should do so.

December.—Lieut.-Governor, suggesting an arrangement for providing and maintaining light.

Forwarded to the Lords of the Treasury.

1857, March.—Board of Trade, forwarding memorial from Chamber of Commerce for light.

Elder Brethren continue to entertain opinion that light would be useful on south-west part of island.

June.—Board of Trade, that they are still in communication with authorities of the island thereon.

Board of Trade, that Mr. A. Gordon recommends an iron lighthouse.

Trinity House consider light should be built of granite.

1858, June.—Messrs. Harvey, Hayle, offering to moor and maintain a lightvessel on Herbert's plan for reasonable period, and if found not to answer, to build an iron lighthouse for 15,500*l*.

Acquainted that there is no intention of placing a lightvessel thereat.

1859, July.—It was resolved to build a light-house, which is now in course of erection on Le Biseau, one of the Hanois group.

1856.

Jersey.

August.—C. Crespinal, Esq., recommending light on the Corbierre.

Forwarded to authorities at Jersey for observations.

December.—Admiralty, requesting opinion in relation to proposed light on Vercluit Pier.

No objection to offer thereto.

1858, April.—Board of Trade, forwarding letter from master of "Prince of Wales," and C. Crespinal, Esq., recommending light on the Corbierre.

Referred to Visiting Committee.

1858.

Alderney, Harbour of Refuge.

December.—Admiralty, whether there is any objection to two lights thereat.

Acquainted that there is no objection.

XV. Total income for lighthouses, floating lights, buoys and beacons, and total expenditure on maintenance of lighthouses, in each year since 1st January 1845:—

	Total Income.	Expenditure for Lighthouses.
1845	£319,325 19 9½	£34,019 17 4
1846	305,363 12 9	27,244 10 4
1847	333,142 5 5	32,922 9 8
1848	341,014 1 4	32,534 3 11
1849	323,429 9 8½	23,412 9 5
1850	271,507 19 8½	24,721 14 2
1851	290,986 13 11	25,384 12 1
1852	286,961 18 8	29,260 6 3
1853	292,856 10 5	27,963 7 11
1854	236,172 19 6	21,022 12 7
1855	253,497 3 5	26,796 7 2
1856	304,648 11 9	33,693 8 11
1857	267,624 10 0	34,148 9 3
1858	255,122 13 3	25,115 3 3

Income.

For the years preceding 1855 the amounts stated are the total of light duties collected for English lights; subsequent years show the totals collected at English Ports.

XVI. Considered by Board; referred by them to Mr. Faraday; tried at the Trinity House or in the experimental lantern at Blackwall; and, if preliminary investigations warrant it, finally at a lighthouse.

XVII. Dates of all applications to Board of Trade for power to construct or reconstruct or alter light-houses since 1st October 1853, with date of final approval, and in case of non-compliance, the reason given for any deviation from the application:—

1854.

Orford.

January 30th.—Requesting sanction for expenditure necessary for repairing damage caused by high tide and providing for future security of buildings.

February 1st.—Board of Trade final approval.

Needles.

June 24th.—Requesting sanction for expenditure required for erection of light on outer Needles rock in lieu of light on present elevated position.

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January 16th, 1855.—Board of Trade final approval.

Smalls.

June 24th.—Requesting sanction for expenditure necessary for erection of new lighthouse of stone instead of present structure on wooden piles.

January 16th, 1855.—Board of Trade final approval.

Whitby.

June 24th.—Requesting sanction for expenditure necessary for erection of a new lighthouse on the cliff east of Whitby.

July 20th.—Board of Trade sanctioned.

November 17th.—Trinity House.—Recommending that two lights should be exhibited.

23rd December.—Board of Trade approve.

1856, February 28th.—Trinity House.—Requesting sanction for expenditure necessary for exhibition of light on Whitby Pier as a general light until coast lights are completed.

March.—Board of Trade.—Sanction declined, their Lordships being of opinion there does not exist urgent necessity.

1858, October.—Trinity House.—Requesting sanction to expenditure for purchase of extra sprig of water.

November.—Board of Trade.—Approve purchase if supply be adequate; suggest lease with right of purchase.

1855.

St. Ives Bay.

January 23rd.—Trinity House.—Preliminary proposal for expenditure necessary for erection of lighthouse therein.

February.—Board of Trade. Will give full consideration on receipt of particulars.

July 13th.—Elder Brethren have adopted recommendation of Committee that light should be on Godrevy, the cost of erection on the Stones being assumed to be too great.

September 12th.—Board of Trade find that Admiralty have been surveying; will be glad of estimate for light on northern Stone.

September 19th.—Trinity House. Advert to Committee's report in which the Stones was considered most eligible site, and that it was question of expense alone which prevented its recommendation. Mr. Walker's estimate, 40,000*l.* to 45,000*l.* sent.

October.—Board of Trade. Request estimate of difference of cost between inner and outer Stone.

Trinity House. Difference (2,000*l.* to 3,000*l.*) found to be too inconsiderable to recommend adoption.

Board of Trade negotiate with War Office for site on St. Ives Head.

1856, September 13th.—Trinity House. Requesting sanction for expenditure necessary for erection of lighthouse on that site, which all parties agree in considering the best, viz., the Stones.

November 25th.—Board of Trade. "Stones" admitted to be most eligible site, but cost too great, having regard to the trade to be benefited to justify charge on Mercantile Marine Fund; their Lordships therefore sanction Godrevy.

1858, March 5th.—Trinity House. Requesting sanction for expense of lightvessel during erection of lighthouse.

March 13th.—Sanctioned.

November 6th.—Trinity House. Requesting sanction for expense of fog bell.

November 12th.—Sanctioned.

South Foreland.

April 10th.—Trinity House. Requesting sanction to expenditure for erecting lightkeepers' dwellings.

April 17th.—Sanctioned.

Portland.

August 9th.—Trinity House. Requesting sanction to expenditure for adaptation of old tower to new light and for lightkeepers' dwellings.

October 16th.—Board of Trade. Sanction as regards adaptation of tower; request modification of plans to reduce outlay for dwellings.

1856, July 12th.—Reduced estimate sanctioned.

Longships.

August 18th.—Requesting sanction to expenditure for erection of lightkeepers' dwellings and boat and storeroom at Sennen Cove.

November 7th.—Board of Trade sanction.

Maplin.

August 15th.—Requesting sanction to expenditure for certain works necessary for security of structure.

September 3rd.—Board of Trade sanction.

Fern.

September 10th.—Requesting sanction to expenditure for increasing power of light on Longstone.

September 15th.—Board of Trade sanction.

Pakefield.

September 10th.—Requesting sanction to expenditure for additional lamp thereat.

September 15th.—Board of Trade sanction.

1856.

Bideford.

February 18th.—Requesting sanction to expenditure for repairing sea defences.

February 21st.—Board of Trade sanction.

Harwich.

February 19th.—Requesting sanction to rent a cottage for lightkeeper of Langard Fort light, and to put the same in repair.

February 28th.—Board of Trade sanction.

1858, July 19th.—Requesting sanction to erect structure to serve the double purpose of dwelling for keeper and place from which to exhibit light instead of at Langard Fort.

Board of Trade. Request further particulars. 1859, May 13th.—Trinity House. Requesting sanction for expenditure for new lighthouses on the Cliff at Dovercourt and on Langard Point.

June 15th.—Board of Trade sanction.

September 21st.—Requesting sanction to expenditure for temporary dwellings for lightkeepers at Langard.

September 27th.—Board of Trade sanction.

Air.

March 6th.—Requesting sanction to expenditure for repair of structure.

March 13th.—Board of Trade sanction.

Lundy.

March 10th.—Requesting sanction to expenditure for new lighting apparatus.

May 19th.—Board of Trade sanction.

1857, May 7th.—Requesting sanction to expenditure for repair of road rendered impassable by landslip.

May 13th.—Board of Trade sanction.

Bardsey.

March 29th.—Requesting sanction to expend ture necessary for improving light thereat.

April 3rd.—Board of Trade sanction.

Haisbro'.

March 29th.—Requesting sanction to expenditure necessary for improving light thereat.

March 31st.—Board of Trade sanction.

Caskets.

April 10th.—Requesting sanction necessary for expenditure for erecting keepers' dwellings.

April 18th.—Board of Trade sanction.

Spurn.

May 14th.—Requesting sanction necessary for expenditure for repairing Low Lighthouse, and for continuing piling round the high tower.

May 19th.—Board of Trade sanction.

1859, September 1st.—Requesting sanction necessary for expenditure for sea defences.

North Foreland.

July 2nd.—Requesting sanction for expenditure for erecting keepers' dwellings.

July 21st.—Board of Trade sanction.

1858, May 5th.—Requesting sanction for expenditure for improving light by substituting dioptric apparatus, and making lantern applicable.

May 12th.—Board of Trade sanction.

June 28th.—Requesting sanction for expenditure for iron girders in lieu of decayed timbers to support lantern.

ENGLAND.
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XVII.

July 6th.—Board of Trade sanction.
1859, February 1st.—Requesting sanction for expenditure for stone stairs and making building fireproof.
Board of Trade inquire as to cheaper method, Trinity House send reasons for proposed plan. Board of Trade sanction, but require tenders to be obtained from not less than six builders, and forwarded to them.
June 23rd.—Final sanction.
November 29th.—Requesting sanction for expenditure for coating tower with cement.
December 3rd.—Board of Trade sanction.

Gunfleet.

October 21st.—Requesting sanction for expense of fog bell and apparatus.
October 31st.—Board of Trade think such works should be put out to contract.
Trinity House explain that arrangement for striking has been devised by Mr. Wilkins, and that it was not thought fair to lay it open to inspection and competition.

1857.

South Stack.

June 11th.—Requesting sanction for expense of erecting lightkeeper's dwelling.
July 4th.—Board of Trade sanction, but think amount very high; request that in future no orders may be given for preparation of plans without their knowledge.

Heligoland.

December.—Requesting sanction for expenditure necessary for increasing dwelling accommodation for keepers.
December.—Board of Trade sanction.

1858.

Dunqeness.

December.—Requesting sanction for expenditure for fog bell.
1859, January.—Board of Trade sanction.
1859, July.—Requesting sanction for expenditure for new lantern and lighting apparatus.

1859.

Burnham.

August.—Requesting sanction for expenditure for improving lightkeepers' dwellings.
August.—Board of Trade sanction.

1860.

Wolf Rock.

April.—Requesting sanction for expenditure for erecting lighthouse thereon.
Board of Trade inquire whether lightvessel would not answer every purpose.
Trinity House explain why not.
Board of Trade request further information.
May.—Trinity House reply.
June.—Board of Trade concur in expenditure necessary for lighthouse; suggest that work should not be commenced until after completion of the Hanois light, when the tug and staff employed thereon would be available.

Nash.

May.—Requesting sanction for expenditure for upholding cliff thereat.
Board of Trade sanction portion of proposed outlay; consider rest of work far from urgent, &c.
June.—Trinity House forward Mr. Walker's observations; state that two new cracks have appeared, and that Board are confirmed in opinion, that the most economical course will be to carry out entire work at once.

XVIII. The papers required were furnished.
XIX. Answers to Questions of a general character in the Special Returns. (See Circular III, for the Questions to which the following are Answers.)
I. The Corporation of Trinity House of Deptford Strand, Trinity House, London, E.C.
V. As a general rule, whenever it appeared desirable to the Elder Brethren to exhibit a new light, it was the practice of the Corporation (previous to October 1853) to ascertain the views of parties likely to be affected thereby, who then signified their willingness to pay the toll requisite for its

LIGHTHOUSES.—GENERAL RETURN.

XIX.

STATEMENT showing the Taxes paid on account of each Lighthouse in 1852, and the Expense for Repairs in 1852 and 1858.

Lights.	Taxes, 1852.	Repairs, 1852.	Repairs, 1858.
	£ s. d.	£ s. d.	£ s. d.
Fern	7 4 0	63 0 5	75 11 11
Couquet	28 3 10	57 1 1	25 19 6
Tinmouth	3 3 9	93 4 4	26 0 5
Finnaro	38 5 9	46 12 3	41 1 1
Spurn	0 10 0	3,228 6 1	540 2 9
Humbstanton	3 16 8	69 14 11	71 5 10
Tromer	6 2 7	46 6 8	33 5 8
Halsbro'	27 16 1	18 15 5	279 4 5
Winterston	- - -	79 11 10	113 8 4
Lowestoft	6 19 3	151 4 4	57 11 0
Pakefield	2 2 0	95 7 11	77 8 7
Orford	36 8 2	453 5 1	46 8 4
Harwich	- - -	28 9 4	36 2 11
Langward	- - -	8 4 4	14 5 7
Gundest	- - -	542 8 3	10 6 9
Maplan	- - -	106 9 1	60 5 3
Chesman	- - -	7 11 0	31 1 6
Stucking	17 15 1	791 10 8	31 1 6
North Foreland	21 16 8	153 4 7	1,062 17 7
South Foreland	56 6 5	187 7 7	241 7 2
Dunqeness	2 2 0	562 9 0	83 10 4
Beechy Head	4 9 7	48 10 2	19 14 2
St. Catherine	- - -	418 1 1	57 1 1
Needles	2 18 4	294 14 10	32 19 5
Hurst	25 6 10	107 30 8	329 14 4
Portland	- - -	118 7 2	343 13 8
Caskets	0 16 1	31 5 11	14 9 0
Plymouth Breakwater	- - -	571 14 5	16 14 10
Edystone	- - -	51 17 0	53 12 11
Falmouth Harbour	1 2 2	157 8 1	16 13 3
Lizard	5 5 3	186 3 4	41 12 10
Longships	- - -	119 4 7	213 5 7
Scilly	2 6 0	50 0 1	85 2 11
Bishop	- - -	- - -	- - -
Galtery	- - -	- - -	- - -
Traveese	2 8 7	119 6 7	168 1 0
Lundy	- - -	453 19 9	532 5 9
Bideford	- - -	7 3 11	63 2 1
Burnham	1 15 1	95 10 7	11 8 8
Avon	2 14 0	144 2 7	31 12 0
Teak	- - -	23 3 1	85 3 10
Flatholm	5 8 4	58 15 6	24 5 0
Nash	3 17 6	192 10 8	17 7 9
Calby	- - -	17 14 7	74 1 7
Milford	5 17 8	140 1 2	84 16 7
Smalls	- - -	224 14 0	10 4 4
So. Bishop	- - -	137 15 7	208 12 5
Bardeley	- - -	157 15 5	71 13 1
South Stack	18 7 6	29 15 11	412 8 0
Sherries	16 5 0	680 9 1	14 2 11
Menni	6 6 10	157 13 7	24 15 2
Air	0 1 8	18 7 9	98 1 8
St. Bees	0 0 1	35 5 5	29 3 2
Heligoland	- - -	38 14 9	8 13 10
Gibraltar	- - -	137 4 2	49 9 5

maintenance by memorializing the Board to establish a light in the locality.

XX. From sunseting to sunrise (except at Bideford, for which see Special Return).

XXXIII. The lighthouses and adjoining buildings are repaired according to requirements, by local tradesmen; whenever it is practicable their work is performed under contract; no lighthouse is kept in repair by annual or periodical contract.

XXXIV. The lighthouses and adjoining premises are painted either by the Corporation's foreman painter with the assistance of hired journeymen, or by a local tradesman for an agreed sum. In either case the paints and oil are supplied from the Corporation's stores.

XXXIX. Pure refined rapeseed oil, price per imperial gallon, estimated at nine pounds weight per gallon, in 1857, four shillings (4s.); in 1858, three shillings and threepence (3s. 3d.).

XLII. From revenues derivable from dues for lights, buoys, and beacons, paid into the Paymaster-General's Office to the account of the Mercantile Marine Fund.

XLIV. The amount stated for 1852 differs from that shown in the Parliamentary Return for that year, as the latter included the cost of collection (now defrayed by the Custom House), taxes (no longer leviable), charges for repairs, and a proportion of the expense of the steam or sailing tender by which each light was served. The whole sum stated to be expended on the lighthouse in each year is made up of items for agency, wages, provisions, rents, and insurance, coals, oil, and stores, boat hire, medical expenses, incidentals and stationery; expenses for repairs are not included, because their exceptional amounts would prevent any comparison between the expenditure of the two years. A statement of the taxes in 1852, and of the repairs in each year, is subjoined. (See table at top of column.)

XLV. XLVI, XLVII. Attached. (See page 52, ante.)

LV. The only tidal light under the immediate jurisdiction of the Corporation is that of Bideford, for which see Special Return.

LVI. The signal code for the Corporation's use by day is submitted. The lighthouses generally have no occasion for night signals, but the Fern Station is supplied with rockets.

CIRCULAR No. III.—LIGHTHOUSES.—SPECIAL RETURN.

THE CORPORATION OF TRINITY HOUSE, LONDON.

The Lights are numbered to correspond with the Index Map.

1.

FERN INNER HIGH.

Near the S.W. Point of the Island.

3. Samuel M. King, North Sunderland, near Chathill, Northumberland.
4. Two, bearing N. by W. $\frac{1}{2}$ N., S. by E. $\frac{1}{2}$ E., 187 yards. The Longstone forms part of the Fern group, for which see Special Return.
5. 1st December 1673. Patent granted to Sir John Clayton and George Blake to erect lighthouses on Fern Islands. March 1775, renewed. See General Return, 19.
6. Capt. John Blackett, and the trade of Newcastle, Sunderland, Whitby, and the north country coasting or fishing trade.
7. The best position with regard to the Megstone and adjacent dangers.
8. 1776, as a coal fire; rebuilt 1809-10. 20th January 1811, as an oil light.
9. Builder, Joseph Nelson. Engineer, Daniel Alexander. Not by contract.
10. Sea light.
11. Stone; solid wall; at base 2 feet 6 inches, at top 2 feet; coated with cement; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 43 feet.
14. 87 feet.
15. 10 miles.
16. 15 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. Perfect revolution in 31 minutes, showing the full face of a reflector every half minute.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch in diameter and parabolic reflectors 21 inches diameter, 9 inches deep Clockwork revolving machine.
22. Seven burners.
23. No alteration.
24. Reflectors, frame, &c., Geo. Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1 $\frac{1}{2}$ in. diameter over the flames of the lamps, and ventilators in the lantern pedestal.
26. None.
27. None.
28. 28 days.
29. 1810: two lighthouses, 5,21*l.* 5*s.* 10*d.* 1842: three dwellings, 2,40*l.* 3*s.* 11*d.* 1846: site, 193*l.* 10*s.* 7*d.*
30. Completed.
31. Diameter, 9 feet. Height: pedestal, 3 feet 6 inches; glass, 5 feet; glass to vane, 12 feet; total, 20 feet 6 inches. Two lanterns, one for high and one for low light, including apparatus and fitting, 3,92*l.* 8*s.* 10*d.*
32. Three lighthouses, 86,445*l.* 13*s.* 2*d.*; December 1824, redemption of the lease.
33. 40*l.* 8*s.* 9*d.* since construction, including low light and Longstone.
34. 80*l.* 6*s.* 1*d.*; by foremen painters; about once in four years.
35. Three for the two inner Fern lights; one, 65*l.*, one, 46*l.* 10*s.*, and one, 45*l.*, a suit of clothes annually, coal, oil, and furniture for dwellings.
36. Included in price of lantern.
37. 1857, 6*l.* 15*s.* 6*d.*, including low light; 1858, 5*l.* 15*s.* 3*d.*, ditto.
38. For the two lights—1857, oil, 812 gallons; wicks, 34 dozen. 1858, 309 gallons; 36 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 7*s.* 1*d.*; 1858, 7*s.* 6*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. For the three lights—1852, 448*l.* 13*s.* 7*d.*; 1858, 284*l.* 3*s.* 5*d.* Total for 1852, 1,340*l.* 4*s.* 8*d.*
44. 1852, 504*l.* 13*s.* 9*d.*; 1858, 590*l.* 8*s.* 4*d.*, including low and outer light (Longstone); and see Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 23rd May, 17th August. 1858, 17th May, 1st October (weather prevented a landing), 2nd October. Agent: 1857, 1st, 24th, 27th June; 2nd July; 1st, 5th, 22nd August; 1st, 23rd September; 2nd November. 1858, 1st, 10th, 24th June; 1st, 5th, 10th July; 2nd August; 1st September; 2nd, 4th, 12, 21st October; 1st, 29th November; 3rd, 24th December.
52. No.
53. Three lamps, with burners complete; in the basement of tower. Diameter of oil cellar, 12 feet; height of oil cellar, 8 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Signal for life-boat, black ball on the flagstaff in the day-time; rockets at intervals of ten minutes at night. For code, see Lighthouses, General Return, 19.
57. Not relieved.

2.

FERN INNER LOW.

Near the N.W. Point of the Island.

3. Samuel M. King, North Sunderland, near Chathill, Northumberland.
4. Two, bearing N. by W. $\frac{1}{2}$ W. and S. by E. $\frac{1}{2}$ E.; 187 yards.
5. 1810. See General Return, 19.
6. Trade of Berwick, Alcmouth, and northern ports.
7. The site best adapted for a low light to serve as a leading mark, in one with the high light, to guide ships through the channel between the two shoals called the *Goldstone* and the *Plough*.
8. 1st February 1811.
9. Builder, Joseph Nelson. Engineer, Danl. Alexander. Not by contract.
10. Sea light.
11. Rough stone; solid wall; at base 1 foot 6 inches, at top 1 foot; not coated; white; octagonal; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 27 feet.
14. 45 feet.
15. 7 $\frac{1}{2}$ miles.
16. 12 miles.
17. 15° north; N. 15 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamp, burner $\frac{3}{4}$ of an inch, and parabolic reflector 21 inches diameter, 9 inches deep.
22. One burner.
23. No alteration.
24. R. Wilkins and Son, London.
25. Faraday's tube, 1 $\frac{1}{2}$ inch diameter over the flame of the lamp.
26. None.
27. None.
28. 28 days.
29. Included in Fern inner high light.
30. Completed.
31. Diameter, 6 feet 6 inches. Height: pedestal, 3 feet 4 inches; glass, 4 feet; glass to vane, 7 feet 10 inches; total, 15 feet 2 inches. Price included in that of the high light.
32. Three lighthouses, 36,445*l.* 13*s.* 2*d.*; December 1824, redemption of the lease.
33. As No. 29.
34. As No. 29.
35. Three for the two inner Fern lights. One, 65*l.*, one, 46*l.* 10*s.*, and one, 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. As No. 29.
37. Ditto.
38. Included in consumption of high light.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross; cost included with high light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Fern Inner High Light.
44. Ditto ditto and see Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. February 1857. Receiver of wreck at Berwick to Board of Trade, who transmit it, "that the leading light should be moved from the Big Fern to the *Megstone*." Decline to adopt recommendation; disapprove of giving further encouragement to vessels using the inner channel at night time or in thick weather.
49. Nil.
50. Committees of Elder Brethren and Agent.
51. Committees: 1857, 23rd May, 17th August. 1858, 17th May, 1st October, 2nd October, (weather prevented a landing). Agent: 1857, 1st, 24th, 27th June; 2nd July; 1st, 5th, 22nd August; 1st, 23rd September; 2nd November. 1858, 1st, 10th, 24th June; 1st, 5th, 10th July; 2nd August; 1st September; 2nd, 4th, 12th, 21st October; 1st, 29th November; 3rd, 24th December.
52. No.
53. One lamp, with burner complete; in oil cellar at high lighthouse. Diameter of oil cellar, 12 feet; height of oil cellar, 8 feet.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

3.

FERN OUTER.

Longstone Rock, one of the Outer Staple Islands.

3. Samuel M. King, North Sunderland, near Chathill, Northumberland.
4. One only, but classed generally with the Inner Ferns.
5. March 1775. For its removal, March 1810. See General Return, 19.
6. 1775, Capt. J. Blackett and trade of the northern ports. 1810, Mr. Robert Gladstone and the old Shipping Company of Berwick-upon-Tweed.
7. On consideration of the position of the previous light on the Brownsman Island relatively with the outer danger called the Navestone, it was removed to its present site as being of greater utility to the general trade.
8. 15th February 1826 (from the Longstone.)
9. Builder and Engineer, Joseph Nelson. Contract for stone only.
10. Sea light.
11. Rough stone; solid wall; at base three feet, at top two feet; not coated; red; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 85 feet.
14. 75 feet.
15. 9½ miles.
16. 15 miles.
17. 96°. The whole circle.
18. Revolving; bright.
19. Perfect revolution in two minutes, showing a flash every 30 seconds.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners seven-eighths of an inch, and parabolic reflectors 21 inches diameter, nine inches deep. Clockwork revolving machine.
22. 12 burners.
23. No alteration.
24. William Wilkins, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps.
26. None.
27. None.
28. 21 days.
29. 1826, lighthouse and adjoining buildings, 4,771*l.* 14*s.* 7*d.* 1842, dwellings, 2,631*l.* 18*s.* 9*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet; glass, 6 feet; glass to vane, 11 feet; total, 21 feet. Price 1,144*l.* 11*s.* 8*d.* (includes illuminating apparatus and cost of fitting.)
32. Redemption of lease, three lighthouses (the Outer Fern then on the Brownsman), 36,442*l.* 13*s.* 2*d.* December 1824.
33. Included in Fern Inner High Light.
34. Included in Fern Inner High Light. About once in four years.
35. Two; one at 80*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in price of lantern. Revolving apparatus, 108*l.* 10*s.*
37. 1857, 4*l.* 8*s.* 6*d.* 1858, 4*l.* 0*s.* 7*d.*
38. 1857, oil, 395 gallons; wicks, 44 dozen. 1858, oil, 395 gallons; wicks, 40 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 9*s.* 2*d.* 1858, 8*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Fern Inner High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren; agent in 1858.
51. Committees:—1857, May 23rd, August 17th; 1858, May 17th, October 1st, weather prevented a landing. Agent:—1858, 3rd, 24th March; 3rd, 27th April; 1st, 10th May; 1st, 10th, 24th June; 1st, 5th, 10th July; 2nd August; 1st September; 4th, 21st October; 1st, 29th November; 3rd, 24th December.
52. 18th March 1852, pane of glass broken by a wild duck; extinguished about 20 minutes.
53. 7 lamps with burners complete. In the basement of the tower. Diameter of oil cellar, 16 feet; height, 11 feet.
54. Barometer with thermometer attached. External and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

4.

COQUET.

The South-west Part of the Island.

3. No agent. Principal keeper acts as local agent. Wm. Brooks Darling, Coquet Lighthouse, Amble, near Acklington, Northumberland.
4. One.
5. April 1826. See General Return, 19.
6. Lieut. Jones, R.N., and persons connected with the northern coasting trade (per the Duke of Northumberland).
7. To keep vessels coming from the southward outside the reef off Hauxley Point.
8. 1st October 1841.
9. Builder, Robert Dunn, Alnwick. Engineer, James Walker, Superintendent of Works, Alexandor Howe. By contract.
10. Sea light.
11. Sandstone; solid walls, 3 feet 9 inches; coated with cement; white; four-sided, with turreted parapet.
12. Dr. Faraday's.
13. 72 feet.
14. 83 feet.
15. 9½ miles.
16. 14 miles.
17. 180°. N. 18 E., S. 18 W.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. Six refractors of 10 to the circle, with 19 zones of prisms, 13 above and six below the refractors. Fountain, four concentric wick lamp, with regulating condenser. Red shades on lens.
22. 1st order.
23. 19th December 1854, zones substituted for mirrors. January 1854, red shade fitted to strike Hauxley Point buoy at suggestion of inspecting committee. March 1854, red shade fitted to strike Boulmer Rocks. No alteration in character.
24. Refractors, Isaac Cookson and Co., Newcastle. Zones, Henry Lepaute, Paris. Frame, lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and by openings in lantern pedestal.
26. None.
27. None.
28. 12 days.
29. Lighthouse and dwellings, 3,268*l.* 5*s.* 2*d.* Buoy store adjoining, 671*l.* 14*s.* 4*d.*
30. Completed.
31. Diameter, 18 feet. Height: pedestal, 4 feet 7 inches; glass, 10 feet; glass to vane, 11 feet 9 inches; total, 26 feet 4 inches. Price, 665*l.* 8*s.* 5*d.* Cost of fitting included in that of fitting illuminating apparatus.
32. Not purchased.
33. 23*l.* 9*s.* 5*d.* since construction. Not by contract.
34. 24*l.* 17*s.* 1*d.* Foreman painters. About once in four years.
35. Three; one at 65*l.*, one at 46*l.* 10*s.*, one at 35*l.*, a suit of clothes annually to the two first, none to the other, and coal, oil, and furniture for the dwellings.
36. 1,426*l.* 7*s.* 4*d.* 486*l.* 15*s.* 1*d.* (including fitting of lantern.)
37. 1857, 8*l.* 12*s.* 6*d.* 1858, 8*l.* 17*s.* 3*d.*
38. 1857, oil, 451 gallons; wicks, 84 yards. 1858, oil, 436 gallons; wicks, 72 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 2*l.* 12*s.* 6*d.* 1858, 2*l.* 5*s.* 4*l.* Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,902*l.* 2*s.* 1*d.* 1858, 544*l.* 3*d.* Total for 1852, 374*l.* 9*s.* 5½*d.* (includes the Coquet Buoys, &c.)
44. 1852, 286*l.* 1*s.* 3*d.* 1858, 287*l.* 15*s.* 10*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
- 48, 49. In 1854, the Corporation having adopted a red shade for marking rocks to the southward, and the Committee of Elder Brethren on the spot having concurred in the suggestion of Mr. Hepplewhite, Harbour Master, Warkworth, for a red light from the lantern in a northerly line to lead vessels clear of Boulmer Rocks, it was fitted.
50. Committees of the Elder Brethren.
51. Committees: 1857, 23rd May, 15th August weather prevented a landing, 17th August. 1858, 2nd October, 1st October weather prevented a landing.
52. No.
53. Three burners; two reservoirs; two receivers. In the bottom of the tower. Length of oil cellar, 10 feet 10½ inches; breadth, 8 feet 8½ inches; height, 10 feet 9½ inches.
54. Barometer with thermometer attached. Aneroid barometer with thermometer. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

5.

TYNEMOUTH.

The Castle Yard.

3. No agent. Principal lightkeeper acts as local agent. Samuel Wesenraft, Tynemouth Lighthouse, near North Shields
4. One.
5. Not known. See General Return, 19.
6. Not known.
7. No record, not having been erected by Trinity House.
8. About 1662 as a coal fire. 11th March 1802 as an oil light.
9. Not known. Built by Sir Edward Villiers.¹
10. Sea light.
11. Sandstone; solid wall, at base 4 feet 9 inches, at top 2 feet 5 inches; coated with cement; white; four-sided or square; lantern gallery three parts round.
12. Dr. Faraday's.
13. 79 feet.
14. 154 feet.
15. 13½ miles.
16. 18 miles.
17. 202° N. 18 E., S. 40. W.
18. Revolving; bright.
19. Perfect revolution in three minutes, showing a face every minute.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch and parabolic reflectors 21 inches diameter, 9 inches deep. Clockwork revolving machine.
22. 18 burners.
23. No alteration.
24. Frame of apparatus and revolving machine, George Robinson, London. Reflectors and lamps, &c., Robert Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by openings in the pedestal of the lantern.
26. None.
27. None.
28. 32 days.
29. Not known. Built by private proprietor.
30. Completed.
31. Diameter, 12 feet. Height; pedestal, 3 feet 6 inches; glass 7 feet; glass to vane, 11 feet; total, 21 feet 6 inches. Price not known.
32. 1st January 1841. 124,678*l.* 17*s.* 2*d.*
33. Since purchase, 26*l.* 15*s.* 5*d.*
34. Since purchase, 21*l.* 10*s.* 3*d.* Foremen painters generally. Once in four years.
35. Two; one at 80*l.* per annum, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Original price not known.
37. 1857. 8*l.* 15*s.* 1858, 18*l.* 11*s.*
38. 1857, oil, 751 gallons; wicks, 120 dozen. 1858, oil, 734 gallons; wicks, 112 dozen.
39. See Lighthouses, General Return, 19.
49. Argand cotton, 2*s.* 6*d.* per gross. 1857, 25*s.* 1858, 23*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 831*l.* 3*s.* 23*d.* 1858, 548*l.* 7*s.* 10*d.* Total for 1852, 2,800*l.* 11*s.* 3*d.*
44. 1852, 268*l.* 16*s.* 1*d.* 1858, 319*l.* 16*s.* 2*d.*, and see Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren.
51. Committees: 1857, 15th August; 1858, 13th August.
52. No.
53. Four lamps, with burners complete; on the ground floor of lighthouse. Diameter of oil cellar, 14 feet 3 inches; height, 8 feet.
54. Barometer with thermometer attached. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

6.

WHITBY, NORTH

Near Ling Hill, High Whitby.

3. John Gatenby, Skinner Street, Whitby, Yorkshire.
4. Two. S. by E. ¼ E., N. by W. ¼ W. 258 yards.
5. June 1844. See General Return, 19.
6. Shipowners of Sunderland and Trustees of the Piers and Harbour of Whitby.
7. As being the preferable headland about High Whitby, and affording a plain mark to coasters for clearing the Whitby Scar.
8. 1st October 1858.
9. Builder, William Falkingbridge, Whitby. Engineer, James Walker. Superintendent of the Works, Henry Norris. By contract.
10. Sea light.
11. Stone; solid walls; 3 feet; not coated; white; octagonal; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 67½ feet.
14. 240 feet.
15. 16½ miles.
16. 23 miles.
17. 190° N. 28 W., S. 17 E.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 5 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors. Red shade outside the lens. Fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 31st October 1858, red shade added by direction of the Board. No alteration in "character."
24. Messrs. R. L. Chance, Brothers, and Co., Birmingham.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp.
26. None.
27. None.
28. Eight in the three months October, November, and December.
29. Two lighthouses, north and south, including dwellings and storehouse, 5,250*l.* 10*s.* 7*d.* Site, 437*l.* 14*s.* 3*d.*
30. Completed.
31. Diameter, 14 feet. Height; pedestal, 5 feet 1 inch; glass, 10 feet; glass to vane, 13 feet 6 inches; total, 28 feet 7 inches. Two lanterns, one for each lighthouse, 3,055*l.* 5*s.*
32. Not purchased.
33. Not lighted till after the first quarter of 1858.
34. Has not been painted or coloured since construction.
35. Two; one at 65*l.* and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 778*l.* fitting and transport included.
37. Not lighted until 1858.
38. 1858, oil (during the three months ending 31st December), 150 gallons; wicks, 8 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7*d.* per yard. 1858 (for 3 months), 5*s.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Toll not collected till after Midsummer 1858.
44. None for 1852.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren; agent in 1858.
51. Committees: 1857, 14th May. 1858, 14th August, 29th and 30th September; 4th and 23rd October. Agent: 9th and 24th December.
52. No.
53. 5 lamps, 2 reservoirs, 2 receivers, 1 set of red shades; in the bottom of tower. Diameter of oil cellar, 12 feet; height, 9 feet.
54. Barometer, with thermometer attached. External and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

7.

WHITBY, SOUTH.

Near Ling Hill, High Whitby.

3. John Gatenby, Skinner Street, Whitby, Yorkshire.
4. Two. S. by E. $\frac{1}{2}$ E., N. by W. $\frac{1}{2}$ W. 258 yards.
5. June 1844. See General Return, 19.
6. Trade of Sunderland and Trustees of the Piers and Harbour of Whitby.
7. As preferable to the other headlands, and affording sufficient elevation to render the light visible over the north creek of Robinhood Bay, and as a mark open E. of the North Light for clearing the Whitby Scar.
8. 1st October 1858.
9. Builder, William Falkingbridge, Whitby. Engineer, James Walker. Superintendent of the Works, Henry Norris. By contract.
10. Sea light.
11. Stone; solid walls; three feet; not coated; white; octagonal; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 48 feet.
14. 240 feet.
15. $16\frac{1}{2}$ miles.
16. 23 miles.
17. 190°. N. 28 W., S. 17 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. $\frac{3}{4}$ refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors, and three and a half spherical reflectors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. None.
24. R. L. Chance, Brothers, and Co., Birmingham.
25. Faraday's tube, $\frac{3}{4}$ inch diameter over the flame of the lamp, and ventilating windguard on lantern.
26. None.
27. None.
28. Eight (in the three months October, November, December).
29. Included in high light return.
30. Completed.
31. Diameter, 11 feet. Height: pedestal, 5 feet 1 inch; glass, 10 feet; glass to vane, 13 feet; total, 28 feet 1 inch. Price included in high light return.
32. Not purchased.
33. Not lighted till after the first quarter of 1858.
34. Has not been painted or coloured since construction.
35. Two; one at 65*l.*, one at 4*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,003*l.* (sitting and transport included).
37. Not lighted until October 1858.
38. 1857, nil. 1858, oil, 167 gallons; wicks, 11 yards, during three months ending 31st December.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, $7\frac{1}{2}$ d. per yard. 1858 (for three months), 6*s.* 10*½*d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. Toll not collected till after Midsummer 1858.
44. 1852, nil. 1858, lighted for three months only.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren; agent in 1858.
51. Committees: 1857, 14th May. 1858, 14th August; 29th, 30th September; 4th, 23rd October. Agent: 1858, 21th, 31st December.
52. 1st October 1858. Down draft caused by the eddy wind from the cliff; extinguished three minutes.
53. 5 lamps, 2 reservoirs, 2 receivers; in the bottom of the tower. Diameter of oil cellar, 13 feet; height of do., 9 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

8.

FLAMBRO'.

About 400 yards within the extreme point of the Head.

3. John Gatenby, Skinner Street, Whitby.
4. One.
5. 1674; renewed November 1805. See General Return, 19.
6. 1674; Sir John Clayton. November 1805, trade of London and northern ports.
7. Its being the most prominent headland. Present site selected in the same line of direction as the old tower, but nearer to the point.
8. About 1674. New tower erected 1806. 1st December 1806, from present lighthouse.
9. Builder, John Matson, Bridlington. Engineer, Samuel Wyatt, London. Superintendent of the Works, Nathaniel Gott. By contract.
10. Sea light.
11. Brick, solid wall; at base 3 feet 6 inches, at top 2 feet 1 inch; not coated; white; circular; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 87 feet.
14. 214 feet.
15. $15\frac{1}{2}$ miles.
16. 20 miles.
17. 295°. N. 28 W., S. 87 W.
18. Revolving; bright and red.
19. Perfect revolution in six minutes, showing a face every two minutes; 2 faces, bright, 1 red.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners seven-eighths of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Red shades over seven of the reflectors; clockwork revolving machine.
22. 21 burners.
23. No alteration.
24. Reflectors and revolving machine, G. Robinson. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, $1\frac{1}{2}$ inch diameter over flames of the lamps, and by openings in the lantern pedestal.
26. None.
27. None.
28. 31 days.
29. Lighthouse, 3,121*l.* 16*s.* 11*d.*; adjoining buildings, 977*l.* 13*s.* 6*d.* site. 13*l.* 10*s.*
30. Completed.
31. Diameter, 13 feet. Height: pedestal, 3 feet 6 inches; glass, 8 feet; glass to vane, 11 feet 6 inches; total, 23 feet. 2,894*l.* 11*s.* 8*d.*, including illuminating apparatus and all charges.
32. Not purchased.
33. Since 1822, 3*l.* 12*s.* 8*d.*
34. Since 1822, 24*l.* 4*s.* 5*d.* Foremen painters. Once in four years.
35. Two; one at 65*l.*, one at 4*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in price of lantern.
37. 1857, 12*l.* 14*s.* 5*d.* 1858, 9*l.* 18*s.* 11*d.*
38. 1857, oil, 857 gallons; wicks, 159 dozen. 1858, oil, 849 gallons; wicks, 133 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 6*s.* 10*½*d. 1858, 1*l.* 7*s.* 8*½*d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer, 1852, 1,222*l.* 15*s.* 7*d.*; Midsummer, 1858, 855*l.* 17*s.* 11*d.* Total for 1852, 4,380*l.* 14*s.* 11*½*d.
44. 1852, 320*l.* 4*s.* 5*d.*; 1858, 330*l.* 3*s.* 1*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 14th August. 1858, 12th and 16th August. Agent: 1857, 24th February; 26th May; 21st August; 10th November. 1858, 12th March; 19th June; 30th September; 24th November; 13th December.
52. 21st November 1851. Pane of glass broken by a wild duck; extinguished about 30 minutes.
53. Four lamps, with burners complete; in the base of the tower. Diameter of cellar, 14 feet 2 inches; height of ditto, 11 feet.
54. Barometer, with thermometer attached. Internal and external thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

9.

SPURN HIGH.

Spurn Point, Mouth of the Humber.

3. William Davie, Yarmouth, Norfolk.
4. Two. N.W. $\frac{1}{2}$ N., S.E. $\frac{1}{2}$ S. 158 yards.
5. August 1661; renewed, 1672. See General Return, 19.
6. 1661, by the trade to Newcastle. 1672, by Mr. Justinian Angell and trade of Newcastle and northern ports.
7. To lead up to the mouth of the Humber.
8. 16th April 1675, from a temporary "swape." 1st Sept. 1776, from the present tower. 20th July 1819, as an oil light. 29th Nov. 1853, as a dioptric light.
9. Builder, William Taylor, of York. Engineer, John Smeaton. By contract.
10. Sea light.
11. Brick; solid wall; coated with cement; at base 3 ft. 9 in., at top 1 ft. 7 in.; red; circular; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 112 feet.
14. 93 feet.
15. 10 $\frac{1}{2}$ miles.
16. 15 miles.
17. 315°. N. 28 E., N. 17 W
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 7 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 29th November 1853, present apparatus fitted in substitution for 24 argand lamps and parabolic reflectors by the Board's direction. No alteration in "character."
24. Optical parts. Henry Lepaute, Paris. Frame, lamps, &c., William Wilkins, London.
25. Faraday's tube, $\frac{4}{3}$ inches diameter over the flame of the lamp, and by openings round the lantern pedestal.
26. None.
27. None.
28. 39 days.
29. Not known. Dwelling 2,447. 3s. 10d. for High and Low Lights.
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 7 feet; glass, 10 feet; glass to vane, 11 feet; total, 28 feet. 2,218*l.* 17s. 11*d.*
32. 309,531*l.* 4s. 6*d.* (two lighthouses.) 1st January 1841, one-fourth. 1st April 1841, three-fourths.
33. 41*l.* 7s. 3*d.* since construction (including low light.)
34. 27*l.* 8s. (including low light.) Not by contract. Coated once in four years.
35. Three (for both lights). One, 65*l.*, one, 46*l.* 10s., one, 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings; 5*l.* per annum for keep of a pony.
- 36.
37. 1857, 30*l.* 14s. 10*d.* (including low light.) 1858, 25*l.* 19s. 11*d.* (ditto.)
38. 1857, oil, 635 gallons (for both lights); wicks, 60 yards (high light only.) 1858, oil, 635 gallons; wicks, 61 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7 $\frac{1}{2}$ *d.* per yard. 1857, 37s. 6*d.* 1858, 38s. 1 $\frac{1}{2}$ *d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 1,726*l.* 9s. 1*d.* (for the two lights); Midsummer quarter, 1858, 1,323*l.* 2s. 9*d.* (ditto.) Total for 1852, 6,711*l.* 8s. 0*d.*
44. 1852, 509*l.* 10s. 8*d.* 1858, 519*l.* 0s. 8*d.* (for the two lights.) See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and agent.
51. Committees: 1857, 25th May; 14th August. 1858, 17th August. Agent: 1857, 24th February; 21st March; 27th June; 5th, 22nd August; 9th November. 1858, 15th March; 21st June; 1st July; 29th September; 23rd November, 31st December.
52. No.
53. Two lamps, with burners complete; one reservoir. In the bottom of the tower. Diameter of oil cellar, 20 feet; height, 10 feet.
54. Barometer, with thermometer attached. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

10.

SPURN LOW.

On the Point, at the Mouth of the Humber.

3. William Davie, Yarmouth, Norfolk.
4. Two. N.W. $\frac{1}{2}$ N., S.E. $\frac{1}{2}$ S. 158 yards.
5. August 1661; renewed 1672. See General Return, 19.
6. 1661, by the Newcastle trade. 1672, by Mr. Justinian Angell and the trade to Newcastle and northern ports.
7. To lead up to the mouth of the Humber.
8. 16th April, 1675, as a temporary light. 1st September 1776, from a wood tower or "swape." 1816, as an oil light from brick tower. 24th June 1852, from the present building (in the same line as regards the high light, but to the northward, the previous building to the southward having been washed away).
9. Builders, Thomas Hutchings and Company. Engineer, James Walker. Superintendent of the Works, Henry Norris. By contract.
10. Sea light.
11. Brick; solid wall, two feet; coated with cement; red; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 76 feet.
14. 50 feet.
15. 7 $\frac{1}{2}$ miles.
16. 12 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Nut revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. Complete lenticular apparatus; fountain, two concentric wick lamp, with regulating condenser.
22. 5th order.
23. 30th January 1848, present apparatus fitted in lieu of argand lamps and parabolic reflectors by the Board's direction. No alteration in "character."
24. Optical parts. Henry Lepaute, Paris. Frame, lamps, &c., William Wilkins, London.
25. Faraday's tube, $\frac{3}{4}$ inches diameter over the flame of the lamp, and by iron grating in the lantern floor.
26. None.
27. None.
28. 39 days.
29. 2,915*l.* 19s. 5*d.*, including temporary light and ad repair to Groynes.
30. Completed.
31. Diameter, 9 feet. Height: pedestal, 4 feet, 6 inches; glass 7 feet; glass to vane, 12 feet 6 inches; total, 24 feet. 895*l.*
32. 309,531*l.* 4s. 6*d.* (two lighthouses.) 1st January 1841, one-fourth. 1st April 1841, three-fourths.
33. Included in Return for Spurn High Light.
34. Included in Return for Spurn High Light. Once in four years.
35. Three (for both lights). One, 65*l.*, one, 46*l.* 10s., one, 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwelling; 5*l.* per annum for keep of a pony.
36. 81*l.* 18s. 4*d.*; 24*l.* 4s.; 11*l.* 7s. 0*d.*
37. Included in Return for Spurn High Light.
38. Consumption of oil included with High Light; wicks, 1857, 16 yards; 1858, 16 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 5 $\frac{1}{2}$ *d.* per yard. 1857, 7s. 4*d.* 1858, 8s. 3*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Spurn High Lighthouse.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 25th May; 14th August. 1858, 17th August. Agent: 1857, 24th February; 21st March; 27th June; 5th, 22nd August; 9th November. 1858, 15th March; 21st June; 1st July; 29th September; 23rd November; 31st December.
52. No.
53. Two lamps, with burners complete; one reservoir. In oil cellar of the High Lighthouse; diameter, 20 feet; height, 10 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

11.

HUNSTANTON.

Top of the Cliff.

8. William Davie, Yarmouth, Norfolk.
4. One.
5. Before 1663. Exact date not known. See General Return, 19.
6. Owners and masters of ships and other mariners; inhabitants of the Port of King's Lynn.
7. The highest elevation commanding the distance of about 12 miles, and extending the light to the Boston Bar and Burnham Flats buoys.
8. 1665, as a coal fire. 1777, as an oil light. 3rd September 1840, as a dioptric light from new tower.
9. Builder, William Candler, Lynn, Norfolk. Engineer, James Walker. Superintendents of works, Dalrymple and Duncan. By contract.
10. Sea light.
11. Stone plinth; brick tower; stone gallery floor; solid wall, at base 4 feet 3 inches, at top 3 feet 6 inches; coated with mastic; white; circular; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 68 feet.
14. 109 feet.
15. 11 miles.
16. 16 miles.
17. 2259. S. 60 W., S. 75 E.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 5 refractors of 8 to the circle, with 8 tiers of concave mirrors, 5 above and 3 below the refractors; red shade outside the lens or refractors; fountain, 3 concentric wick lamp, with regulating condenser.
22. 2nd order.
23. No alteration.
24. Optical portions, J. Cookson and Co., Newcastle-on-Tyne. Frame Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube over the flame of lamp, 3½ inches diameter, and by ventilators round the pedestal of the lantern.
26. None.
27. None.
28. 12 days.
29. Light tower and two dwellings, 2,696*l.* 13*s.* 8*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet; glass, 8 feet; glass to vane, 10 feet; total, 22 feet. Price 1,037*l.* 16*s.* 7*d.*
32. 1,221*l.* 0*s.* 8*d.*, 1st January; 384*l.* 2*s.* 10*d.*, 4th February, 1837. Total, 1,605*l.* 3*s.* 6*d.*
33. 28*l.* 2*s.* 0*d.* since purchase.
34. 19*s.* 3*d.* since purchase. Not by contract. Once in four years.
35. Two; one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil and furniture for dwellings.
36. Price 516*l.* 12*s.* 11*d.* Transport, 81*l.* 3*s.* Fitting, 228*l.* 6*s.*
37. 1857, 10*l.* 15*s.* 6*d.* 1858, 15*l.* 16*s.* 9*d.*
38. 1857, oil, 258 gallons; wicks, 52 yards. 1858, oil, 256 gallons; wicks, 51 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 6½*d.* per yard. 1857, 28*s.* 2*d.*; 1858, 27*s.* 7½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 68*l.* 15*s.* 8*d.*; 1858, 41*l.* 16*s.* Total for 1852, 300*l.* 18*s.*
44. 1852, 262*l.* 4*s.* 6*d.*; 1858, 198*l.* 4*s.* 9*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 23rd August. 1858, 17th August. Agent: 1857, 27th February; 29th March; 28th May; 25th August; 7th November. 1858, 7th March; 22nd June; 28th September; 25th November.
52. No.
53. Two burners, one reservoir, one receiver, one refractor, two mirrors, one red shade. Oil stored in a cellar or vault at the base of tower, underground. Diameter, 12 feet; height, 9 feet.
54. Barometer, with thermometer attached, and external thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

12.

CROMER.

About 250 yards from the Cliff.

3. Henry Sandford, Crauer, Norfolk.
4. One.
5. 1674. Renewed 1718. See General Return, 19.
6. 1674, Sir John Clayton. 1718, Edward Bowell, of Ipswich, and masters of vessels in the coal trade belonging to Newcastle, Yarmouth, and ports northward.
7. Present site selected in consequence of a fall of the cliff in front of the old lighthouse.
8. 29th September 1719, as a coal fire. 8th September 1792, as an oil lamp. 29th June 1838, from present tower.
9. Builders, Messrs. Freeman. Engineer, James Walker. Superintendent of Works, — Baily. By contract.
10. Sea light.
11. Stone and brick; solid wall, at base 4 feet, at top 3 feet; coated with cement; white; octagonal; stone lantern gallery.
12. Dr. Faraday's.
13. 61 feet.
14. 274 feet.
15. 17½ miles.
16. 23 miles.
17. 1929. N. 50 W., S. 88 E.
18. Revolving; bright.
19. Perfect revolution in three minutes, showing a face every minute.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¼ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clock-work revolving machine.
22. 30 burners.
23. No alteration.
24. Reflectors and revolving machine, Messrs. Robinson and Wilkins, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by openings in the pedestal of the lantern.
26. None.
27. None.
28. 45 days.
29. 3,892*l.* 0*s.* 7*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 8 feet; glass to vane, 13 feet; total, 25 feet 6 inches. 1,056*l.* 1*s.* 11*d.*
32. Not purchased. Lease expired 1822.
33. 14*l.* 7*s.* 1*d.* since 1822.
34. 14*l.* 12*s.* 10*d.* since 1822.
35. Two; one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually to one keeper, and coal, oil, and furniture, for dwellings.
36. 537*l.* 6*s.* 7*d.* (part adapted from old). Fitting, 39*l.* 10*s.* Transport, 106*l.* 7*s.* 4*d.*
37. 1857, 23*l.* 13*s.* 9*d.* 1858, 15*l.* 18*s.* 1*d.*
38. 1857, oil, 970 gallons; wicks, 129 dozen. 1858, oil, 968 gallons; wicks, 124 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 26*s.* 10½*d.* 1858, 25*s.* 10*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,054*l.* 13*s.* 5½*d.* 1858, 711*l.* 5*s.* 7*d.* Total for 1852, 3,918*l.* 3*s.* 10½*d.*
44. 1852, 394*l.* 6*s.* 1*d.* 1858, 378*l.* 19*s.* 4*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 13th August. 1858, 18th August. Agent: 1857, 31st January; 23rd February; 31st May; 30th June. 1858, 31st January; 29th February; 31st March; 30th April; 31st May; 30th June; 31st July; 31st August; 30th September; 31st October; 30th November; 31st December.
52. No.
53. Seven lamps, with burners complete. Lower floor of the tower—Diameter of oil cellar, 17 feet; height, 8 feet 2 inch.
54. Barometer, with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

13.

HAISBOROUGH HIGH.

S.S.E. of Haisborough Church.

3. William Sturgess, Bacton, near North Walsham, Norfolk.
4. Two. N.W. $\frac{1}{2}$ W., S.E. $\frac{1}{4}$ E. Half a mile.
5. 1789. See General Return, 19.
6. Mr. Henry Taylor, of North Shields, and trade of Newcastle, Whitby, and Scarborough.
7. The Haisbro' shore lights, with the floating light, were established for the safe guidance of vessels passing in and out of Haisbro' Gateway.
8. 1st January 1791. (The lights at Caistor and the small light at Winterton then discontinued as unnecessary.)
9. Builders, James Green, Wroxham, Norfolk; Joseph Stannard, Norwich, Norfolk. Engineers, William Wilkins, Norwich; Richard Norris, London. Built by contract.
10. Sea light.
11. Brick; solid wall, at base four feet, at top three feet; not coated; white; circular; lantern gallery with iron railing.
12. Dr. Faradays.
13. 94 feet.
14. 137 feet.
15. 12 $\frac{1}{2}$ miles.
16. 17 miles.
17. 179^o. N. 26 W., S. 9 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, nine inches deep.
22. 13 burners.
23. No alteration.
24. Reflectors and frame, Geo. Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ inch diameter over the flames of the lamps, and ventilators in walls.
26. None.
27. None.
28. 17 days.
29. Lighthouse (1790), 3,924l. 17s. 1d., including low lighthouse dwellings (1842), 1,706l. 18s.; site of dwellings, 143l. 13s. 1d.
30. Completed.
31. Diameter, 14 feet 6 inches. Height: pedestal, 3 feet 5 inches; glass, 1 foot; glass to vane, 9 feet; total, 19 feet 5 inches. Price, two lanterns and lighting apparatus, 1,851l. 7s. 10d.
32. Not purchased.
33. 40l. 2s. 1d. since 1822, including Low Light.
34. 33l. 18s. 10d. (including Low Light). Not by contract. Once in four years.
35. Two keepers: one at 65l. and one at 45l. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in price of lanterns.
37. 1857, 30l. 10s. 7d., including Low Light. 1858, 20l. 18s. 7d. ditto.
38. 1857, oil, 442 gallons; wicks, 76 dozen. 1858, oil, 452 gallons; wicks, 87 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2s. 6d. per gross. 1857, 15s. 10d. 1858, 18s. 1 $\frac{1}{2}$ d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,564l. 15s. 9d.; 1858, 900l. 14s. Total for 1852, 5,650l. 16s. 7d. (Includes the Haisbro' Low Lighthouse and Newarp Floating Light.)
44. 1852, 541l. 9s. 9d., including Low Light. 1858, 631l. 7s. 1d., ditto. (See Lighthouses, General Return, 19.)
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 13th August. 1858, 18th August; 5th Oct. Agent: 1857, January 1, 7, 13, 19, 24, 30; February 2, 9, 14, 19, 25, 28; March 2, 7, 11, 16, 21, 27; April 1, 7, 12, 18, 23, 29; May 1, 7, 12, 15, 21, 27; June 1, 6, 12, 17, 24, 26; July 1, 6, 12, 15, 21, 26; August 1, 7, 13, 16, 19, 23, 26; September 1, 3, 6, 11, 17, 21, 28; October 1, 8, 14, 19, 24, 29; November 3, 7, 11, 17, 23, 28; December 1, 7, 10, 16, 23, 28. 1858, January 1, 6, 12, 18, 23, 24, 30; February 3, 8, 14, 19, 24; March 1, 7, 9, 15, 20, 25; April 2, 6, 12, 18, 23, 28; May 1, 6, 13, 18, 22, 28; June 2, 7, 9, 15, 21, 23, 26; July 1, 3, 8, 12, 13, 19, 26, 28, 29; August 1, 4, 8, 13, 16, 18, 29; September 4, 9, 12, 17, 22, 24, 30; October 4, 8, 14, 20, 25, 30; November 2, 7, 12, 17, 25; December 2, 5, 8, 13, 17, 24.
52. No.
53. Two lamps, with burners complete. On the ground floor of the tower; diameter of the oil cellar, 15 feet; height, ditto, 9 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

14.

HAISBOROUGH LOW.

S.S.E. of Haisborough Church.

3. William Sturgess, Bacton, near North Walsham, Norfolk.
4. Two. N.W. $\frac{1}{2}$ W., S.E. $\frac{1}{4}$ E. Half a mile.
5. 1789. See General Return, 19.
6. Mr. Henry Taylor, of North Shields, and trade of Newcastle, Whitby, and Scarborough.
7. The Haisbro' shore lights, with the floating light, were established for the safe guidance of vessels passing in and out of Haisbro' Gateway.
8. 1st January 1791. The lights at Caistor and the small light at Winterton were then discontinued as unnecessary.
9. Builders, James Green, Wroxham; Joseph Stannard, Norwich. Engineers, William Wilkins, Norwich; Richard Norris, London. By contract.
10. Sea light.
11. Brick; solid wall, at base 3 feet, at top 2 feet; not coated; white; circular; lantern gallery with iron railing.
12. Dr. Faradays.
13. 74 feet.
14. 100 feet.
15. 10 $\frac{1}{2}$ miles.
16. 15 miles.
17. 179^o. N. 26 W., S. 9 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 13 burners.
23. No alteration.
24. Reflectors and frame, Geo. Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ inch diameter over the flames of the lamps, and ventilators fixed in walls.
26. None.
27. None.
28. 11 days.
29. Included in High Lighthouse.
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 3 feet 4 inches; glass, 6 feet; glass to vane, 8 feet; total, 17 feet 4 inches. Price included in High Light Return.
32. Not purchased.
33. Included in High Lighthouse Return.
34. Included in High Lighthouse Return.
35. Two keepers, one at 65l. and one at 45l. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in price of lantern.
37. Included in High Lighthouse Return.
38. 1857, oil, 449 gallons; wicks, 62 dozen. 1858, oil, 472 gallons; wicks, 66 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton. 2s. 6d. per gross. 1857, 12s. 11d. 1858, 13s. 9d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Haisbro' High Light.
44. Do. Do.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of Elder Brethren and Agent.
51. Committees: 1857, 13th August. 1858, 18th August. Agent, 1857, January 1, 7, 13, 19, 24, 30; February 2, 9, 14, 19, 25, 28; March 2, 7, 11, 16, 21, 27; April 1, 7, 12, 18, 23, 29; May 1, 7, 12, 15, 21, 27; June 1, 6, 12, 17, 24, 26; July 1, 6, 12, 15, 21, 26; August 1, 7, 13, 16, 19, 23, 26; September 1, 3, 6, 11, 17, 21, 28; October 1, 8, 14, 19, 24, 29; November 3, 7, 11, 17, 23, 28; December 1, 7, 10, 16, 23, 28. 1858, January 1, 6, 12, 18, 23, 24, 30; February 3, 8, 14, 19, 24; March 1, 7, 9, 15, 20, 25; April 2, 6, 12, 18, 23, 28; May 1, 6, 13, 18, 22, 28; June 2, 7, 9, 15, 21, 23, 26; July 1, 3, 8, 12, 13, 19, 26, 28, 29; August 1, 4, 8, 13, 16, 18, 29; September 4, 9, 12, 17, 22, 24, 30; October 4, 8, 14, 20, 25, 30; November 2, 7, 12, 17, 25; December 2, 5, 8, 13, 17, 24.
52. No.
53. Two lamps, with burners complete; on ground floor of the tower. Diameter of oil cellar, 19 feet 4 inches; height, 8 feet 8 inches.
54. Barometer, with thermometer attached, and external and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

15.

WINTERTON.

On the Point (Wintertonness.)

3. Robt. Rising, Horsely, near Yarmouth, Norfolk.
4. One.
5. About 1615. See General Return, 19.
6. Not known.
7. No record (a purchased lighthouse.)
8. About 1615. 23rd November 1791 as an oil light.
9. Not known; built by lessee.
10. Sea light.
11. Brick; solid wall, 3 feet 6 inches; coated with cement; coloured red; octagonal; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 60½ feet.
14. 97 feet.
15. 9—10½ miles.
16. 14 miles.
17. 162°. N. 16 W., S. 34 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 11 burners.
23. No alteration.
24. Reflectors and frame, Geo. Robinson, London. Lamps, &c., Robert Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by air tubes through the walls.
26. One.
27. None.
28. 81 days.
29. Lighthouse not known; built by lessee. Two dwellings, 1, 212l. 13s. 6d.
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 3 feet 7 inches; glass, 6 feet 6 inches; glass to vane, 9 feet 8 inches; total, 19 feet 9 inches.
32. 37,896l. 7s. 1d. for the Winterton and two Orford Lights, 1st January 1857.
33. 33l. 17s. since 1836.
34. 20l. 10s. 1d. since 1836. Not by contract. Once in four years.
35. Two; one at 65l. per annum, one at 45l. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. 1857, 12l. 11s. 8d.; 1858, 17l. 2s. 7d.
38. 1857, oil, 440 gallons; wicks, 75 dozen. 1858, 415 gallons; wicks, 76 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2s. 6d. per gross. 1857, 15s. 7½d.; 1858, 15s. 10d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 2,704l. 1s. 9½d. 1858, 1,655l. 13s. 2d. Total for 1852, 9,800l. 5s. 10½d., includes the two Orford lighthouses.
44. 1852, 238l. 19s. 9d. 1858, 284l. 16s. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 13th August. 1858, 19th August, 5th October. Agent: 1857, 1st, 31st January; 1st, 14th, 28th February; 3rd, 15th, 31st March; 1st, 30th April; 1st, 30th May; 2nd, 30th June; 1st, 28th July; 1st, 11th August; 2nd, 30th September; 1st, 31st October; 1st, 19th, 30th November; 1st, 26th December. 1858, 1st, 31st January; 1st, 27th February; 2nd, 12th, 29th March; 1st, 30th April; 1st, 31st May; 1st, 16th, 26th June; 1st, 11th, 31st July; 1st, 30th August; 1st, 9th, 23rd, 30th September.
52. No.
53. 5 lamps, with burners complete; on the ground floor of lighthouse. Diameter of oil cellar, 12 feet 3 inches; height, 8 feet 2 inches.
54. Barometer, with thermometer attached. Internal and external thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

16.

LOWESTOFT HIGH.

On the Cliff.

1. William Davie, Yarmouth, Norfolk.
4. Two. N. ½ E., S. ½ W. 1,013 yards.
5. Not known. See General Return, 19.
6. Not known.
7. The best situation for the high light to serve as a leading mark for the Stanford Channel when in one with the low light.
8. 1609. Rebuilt 1628 and 1676. 25th January 1796 as an oil light.
9. Not known.
10. Sea light.
11. Brick; solid wall; at base, 3 feet 6 inches, at top 3 feet; coated with cement; white; circular; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 53 feet.
14. 119 feet.
15. 12 miles.
16. 16 miles.
17. 165°. N. 37 E., S. 22 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch and parabolic reflectors 21 inches diameter, 6½ inches deep.
22. 11 burners.
23. No alteration.
24. Reflectors, Geo. Robinson, London. Lamps, &c., R. Wilkins and Son, London. Frame of apparatus, W. Wilkins and Co.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and ventilators round the lantern.
26. None.
27. None.
28. 27 days.
29. Tower not known. Dwellings, 1,585l. 1s. 3d.
30. Completed.
31. Diameter, 13 feet. Height: pedestal, 3 feet 6 inches; glass, 7 feet; glass to vane, 13 feet 6 inches; total, 24 feet.
32. Not purchased.
33. 49l. 12s. 10d. since 1822, including Low Lighthouse.
34. 27l. 18s. 2d., including Low Lighthouse. Not by contract. Once in four years.
35. Two; one at 65l. and one 45l. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 317l. 19s. 6d. 1856, frame and apparatus for lamps, 54l. 11s.
37. 1857, 45l. 15s. 4d.; 1858, 27l. 2s. 2d., including Low Lighthouse.
38. 1857, oil, 477 gallons; wicks, 111 dozen. 1858, oil, 474 gallons; wicks, 90 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2s. 6d. per gross. 1857, 1l. 5s. 1½d.; 1858, 18s. 9d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,576l. 12s. 9½d.; 1858, 909l. 16s. 8d. Total for 1852, 5,657l. 3s. 7d., includes the Lowestoft, Low, and Pakefield lighthouses, and the Stanford floating light.
44. 1852, 583l. 0s. 8d.; 1858, 364l. 17s. 2d., including Low Light. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of Elder Brethren and Agent.
51. Committees: 1857, 24th August; 24th September. 1858, 20th August. Agent: 1857, 5th, 22nd January; 17th, 28th February; 13th, 26th March; 27th April; 5th, 26th June; 17th, 27th July; 31st August; 14th, 28th September; 5th, 28th October; 5th November; 1st December. 1858, 11th, 28th January; 26th February; 29th March; 28th April; 4th June; 5th July; 5th August; 5th, 27th October; 25th November; 29th December.
52. No.
53. Three lamps, with burners complete. In the bottom of the tower, underground. Diameter of oil cellar, 14 feet 6 inches; height, 12 feet.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

17.

LOWESTOFT, LOW.

Lowestoft Beach.

3. William Davie, Yarmouth, Norfolk.
4. Two. N. $\frac{1}{2}$ E.; S. $\frac{1}{2}$ W. 1,013 yards.
5. Not known. See General Return, 19.
6. Not known.
7. To enable vessels to pass into the Stanford Channel from the southward, with the two lights in one.
8. 1609. 1730 as an oil light. 25th January 1796, improved. 1st May 1832, from present lighthouse.
9. Builder, Joseph Bemment, Lowestoft; Engineer, Richard Suter, London. By contract.
10. Sea light.
11. Lantern erected on a framing of timber upon a brick foundation. White; square building, with a gallery of wood, enclosed by iron railing.
12. Dr. Faraday's.
13. 48 feet.
14. 45 feet.
15. 7 $\frac{1}{2}$ miles.
16. Eleven (11).
17. 73°. S. 33 $\frac{1}{2}$ E.; S. 39 $\frac{1}{2}$ W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 7 inches deep.
22. Three burners.
23. No alteration.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{4}$ inch diameter, over the flames of the lamps, and by ventilators round the lantern.
26. None.
27. None.
28. Seven (7).
29. 1832. Framework, 305*l.* 0*s.* 9*d.*; dwellings, &c., 283*l.* 17*s.*
30. Completed.
31. Diameter, 8 feet 6 inches. Height: pedestal, 3 feet 6 inches; glass, 5 feet 6 inches; glass vane, 10 feet; total, 19 feet. Price, altered from old light, 91*l.* 10*s.* 11*d.*
32. Not purchased.
33. Included in High Light.
34. Included in High Light.
35. One, 65*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. 55*l.* 6*d.*, altered from old light.
37. Included in High Light.
38. 1857, oil, 127 gallons; wicks, 18 dozen. 1858, oil, 131 gallons; wicks, 18 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 3*s.* 9*d.*; 1858, 3*s.* 9*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Lowestoft High Light.
44. Do. do.
- 45, 46, 47. Nil. See Lighthouses General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1837, 24th August; 24th September. 1858, 20th August. Agent: 1857, 5th and 22nd January; 17th and 28th February; 13th and 26th March; 27th April; 5th and 26th June; 17th and 27th July; 31st August; 2nd and 23rd September; 5th and 29th October; 5th November; 1st December. 1858, 11th and 29th January; 26th February; 29th March; 28th April; 4th June; 5th July; 5th August; 5th and 27th October; 25th November; 30th December.
52. No.
53. One lamp, with burner complete. In a room at the rear of the lighthouse adjoining the kitchen. Dimensions, 10 feet \times 4 inches by 8 feet 5 inches; height, 8 feet 11 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

18.

PAKEFIELD.

South Part of the Cliff.

3. William Davie, Yarmouth, Norfolk.
4. One.
5. No application. Proposed by an Inspecting Committee of the Elder Brethren in July 1831. See General Return, 19.
6. No application.
7. The best position for lighting the channel between the Newcome and Barnard Sands.
8. May 1, 1832.
9. Builder, James Taylor, Yarmouth; Engineer, Richard Suter, London. By contract.
10. Sea light.
11. Brick; solid wall, 1 foot 2 inches, coated with compo; white; circular lantern, gallery with iron railing.
12. Dr. Faraday's.
13. 34 feet.
14. 68 feet.
15. Nine miles.
16. Nine miles.
17. 6°. N. $\frac{1}{2}$ W.; N. $\frac{3}{4}$ W.
18. Fixed; red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Red shade inside lantern; glass.
22. Two burners.
23. September 1855. One burner added at suggestion of an Inspecting Committee in July 1855. No alteration in "character."
24. William Wilkins and Company, London.
25. Faraday's tubes, $\frac{1}{4}$ inch diameter, over the flames of the lamps, and by air tubes in the lantern pedestal.
26. None.
27. None.
28. 17.
29. 82*l.* 9*s.* 4 $\frac{1}{2}$ *d.*
30. Completed.
31. Diameter, 12 feet 6 inches. Height: pedestal, 2 feet 3 inches; glass, 4 feet; glass to vane, 9 feet 3 inches; total, 15 feet 6 inches. Price, 380*l.* 1*s.* 8*d.*
32. Not purchased.
33. 25*l.* 10*s.* 7*d.* since construction.
34. 8*l.* 7*s.* 2*d.* Nut by contract, coated once in four years.
35. Two. One 65*l.*, one 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 190*l.* 18*s.* 6*d.*
37. 1857, 18*l.* 4*s.* 3*d.* 1858, 4*l.* 1*s.* 11*d.*
38. 1857, oil, 84 gallons; wicks, 19 dozen. 1858, oil, 87 gallons; wicks, 18 dozen.
39. See Lighthouses General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 3*s.* 11 $\frac{1}{2}$ *d.* 1858, 3*s.* 9*d.*
41. Nil.
42. See Lighthouses General Return, 19.
43. See Return for Lowestoft High Light.
44. 1859, 157*l.* 4*s.* 8*d.* 1858, 187*l.* 5*s.* 4*d.* (See Lighthouses, General Return, 19.)
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. August, 1858. Messrs. Gowing, Sons, and Rounce suggest alterations in the leading light and the buoyage of Pakefield Gwaty; the brig "Wilberforce" having grounded midway between the South Newcome and the North Barnard.
49. This channel repeatedly alters; a slight change was made at this period.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1837, 24th August and 24th September. 1858, 27th August and 24th September. Agent: 1857, 9th and 22nd January; 17th February; 12th and 26th March; 27th April; 5th and 26th June; 17th and 27th July; 31st August; 14th September; 5th and 29th October; 5th November; 1858, 11th and 28th January; 26th February; 29th March; 28th April; 4th June; 5th July; 4th and 20th August; 5th and 27th October; 25th November; 30th December.
52. No.
53. Two lamps, with burners complete; one reflector. In the basement of the tower. Diameter of oil cellar, 12 feet 4 inches; height, 10 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

19.

ORFORD, HIGH.

On Orfordness

3. The Light Committee of the Board.
4. Two. N.E. by E.; S.W. by W. 1,439 yards.
5. 1634. See General Return, 19.
6. Sir John Meldrum, and masters of vessels of London and ports on the east coast.
7. For leading between Sizewell Bank and Aldbro' Napes to the northward, and between the Cutler and Whiting and Bawdsey to the southward, and to the anchorage in Hoseley Bay.
8. About 1634; rebuilt 1792-3. 6th May 1793, as an oil light from new tower.
9. Builder not known. Engineer, William Wilkins, Norwich. Whether by contract or otherwise, not known.
10. Sea light.
11. Brick, solid wall; at base, 3 feet 8 inches; at top, 2 feet 3 inches; stuccoed; red. Circular. Lantern gallery, with iron railings.
12. Dr. Faraday's.
13. 89 feet.
14. 83 feet.
15. 9½ miles.
16. 14 miles.
17. 207°. N. 4½ E.; S. 7½ W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 16 burners.
23. 16th April 1859. Two burners added on suggestion of an Inspecting Committee in October, 1858. No alteration in character.
24. Reflectors, George Robinson, London. Frame, lamps, &c., William Wilkins and Company.
25. Faraday's tubes, 1½ inches diameter, over the flames of the lamps, and by openings in the lantern pedestal.
26. None.
27. None.
28. 15 days.
29. Not known. Built by lessee (Lord Howard). Additional rooms and outbuildings to dwellings, 1,342*l.* 9*s.* 3*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 3 feet 4 inches; glass, 6 feet 3 inches; glass to vane, 8 feet 11 inches; total, 18 feet 6 inches. Price not known.
32. 37,896*l.* 7*s.* 1*d.*; 1st January 1837 (including Orford Low and Winterton Lights).
33. 67*l.* 16*s.* since purchase, including Low Light.
34. 53*l.* 19*s.* 6*d.*, including Low Light; not by contract; once in four years.
35. Two; one, 65*l.*, one, 46*l.* 10*s.* per annum; a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. 1857, 26*l.* 5*s.* 7½*d.*, including Low Light; 1858, 22*l.* 4*s.* 6*d.*, ditto.
38. 1857, oil, 462 gallons; wicks, 91 dozen. 1858, oil, 471 gallons; wicks, 87 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 18*s.* 11½*d.*; 1858, 18*s.* 1½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Winterton Lighthouse.
44. 1852, 490*l.* 19*s.* 11*d.*, including Low Light; 1858, 493*l.* 8*s.* 11*d.*, ditto. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. Committees: 1857, 24th April. 1858, 24th April, 20th August, 14th October, 16th September (weather prevented a landing). Blackwall Superintendent: 1857, 3rd January; 28th March, 26th June, 25th September, 13th November. 1858, 1st January, 26th March, 29th June, 29th September, 22nd November, 29th December.
52. No.
53. Six lamps, with burners complete; in the base of the tower, oil cellar (semi-circular), diam. *er.* 21 feet; height, 11 feet 10 inches.
54. Barometer, with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return,
56. Ditto, ditto.
57. Not relieved.

20.

ORFORD, LOW.

On Orfordness.

3. The Light Committee of the Board.
4. Two. N.E. by E.; S.W. by W. 1,439 yards.
5. 1634. See General Return, 19.
6. Sir John Meldrum, and masters of vessels of London and ports on the east coast.
7. For leading between Sizewell Bank and Aldbro' Napes to the northward, and between the Cutler and Whiting and Bawdsey to the southward, and to the anchorage in Hoseley Bay.
8. About 1634, from a timber building; 14th October 1793, as an oil light; January, 1838, as a dioptric light.
9. Not known.
10. Sea light.
11. Brick, solid walls; at base, 3 feet 10 inches, at top, 3 feet 1 inch; stuccoed, red. Octagonal. Lantern gallery, with iron railings.
12. Dr. Faraday's.
13. 72 feet.
14. 63 feet.
15. 8½ miles.
16. 13 miles.
17. 211°. N. 42 E.; S. 73 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric, 6 refractors of 10 to the circle, with 19 zones of prisms, 15 above and 6 below the refractors, Rountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. August 1850; zones substituted for mirrors on suggestion of an Inspecting Committee. No alteration in character.
24. Refractors, Isaac Cookson and Company, Newcastle. Zones, Henry Lepaute, Paris. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter, over the flame of the lamp, and by openings in the lantern pedestal.
26. None.
27. None.
28. 9 days.
29. Not known; built by lessee, 1843; dwellings, 2,429*l.* 10*s.* 6*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 10 feet; glass to vane, 11 feet 2 inches; total, 25 feet 8 inches. Price 1,633*l.* 1*s.* 6*d.*
32. 37,896*l.* 7*s.* 1*d.*, 1st January 1837 (including Orford High and Winterton Lights).
33. Included in Orford High Light Return.
34. Ditto.
35. Two; one 65*l.*, one 45*l.* per annum; a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 825*l.* 11*s.* 2*d.*; 116*l.* 10*s.* 6*d.*; 11*l.* 0*s.* 2*d.*
37. Included in High Light Return.
38. 1857, oil, 423 gallons; wicks, 41 yards. 1858, oil, 426 gallons; wicks, 40 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 25*s.* 7½*d.*. 1858, 25*s.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Winterton Lighthouse.
44. Included in High Light Return.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. Committees: 1857, 24th April. 1858, 24th April, 20th August, 14th October, 16th September (weather prevented a landing). Blackwall Superintendent: 1857, 3rd January; 26th March, 27th June, 24th September, 13th November. 1858, 1st January, 26th March, 29th June, 29th September, 22nd November, 29th December.
52. No.
53. Three burners, one refractor; at the base of the tower; oil cellar semi-circular; diameter, 16 feet 5 inches; height, 10 feet 9 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

21.

HARWICH, HIGH.

Entrance of Harwich Harbour, South of the Town. Upper Light in High Tower.

3. The Light Committee of the Board.
4. Two towers. N. W. by N.; S. E. by S. 218 yards; two lights in the High Tower. Upper Light 33 feet above the lower.
5. November 1664. See General Return, 19.
6. Sir William Batten, Surveyor to the Navy, and 104 owners and masters of ships trading to Newcastle, Sunderland, and farther northward.
7. Best position in line with the low light to lead into the harbour.
8. About 1,665. 31st March 1818, from new tower as an oil light; raised to its present position, 1822.
9. Builder, Mr. Lee; Engineer, Daniel Alexander. If by contract or otherwise, not known. Built by lessee.
10. Sea light.
11. Brick (on a wood pile foundation); inner and outer wall (inner wall, 9 inches; vacuity, 6 inches; outer wall, 12 inches); octagonal; gallery railing before the light-room window; railing round the base. Not coated, white.
12. Mr. Faraday's.
13. 85 feet.
14. 69 feet.
15. 9 miles.
16. 13 miles.
17. 110°. S. 20½ W.; S. 89½ E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 9 burners.
23. No alteration.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter, over the flames of lamps and air openings round the tower, with pipes leading to ventilator in centre of lantern floor.
26. None.
27. None.
28. 15 days.
29. Not known; built by lessee; two dwellings, 923*l.* 6*s.* 2*d.*
30. Completed.
31. No lantern. Diameter of light-room, 10 feet; height of window, 5 feet 8 inches; width of ditto, 9 feet 5 inches.
32. 31,730*l.* 1*s.* (the two lighthouses), 1st January 1837.
33. 54*l.* 6*s.* 11*d.*, including Low Lighthouse.
34. 25*l.* 19*s.* 2*d.*, including Low Lighthouse. Not by contract. Once in four years.
35. Three for both lighthouses; one at 65*l.* per annum, one at 46*l.* 10*s.* per annum, and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. 1857, 13*l.* 2*s.* 3*d.*, including Harwich Low Light. 1858, 8*l.* 11*s.* 11*d.*, ditto.
38. 1857, oil, 216 gallons; wicks, 37 dozen. 1858, oil, 328 gallons; wicks, 56 dozen. For both lights in High Tower.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 7*s.* 8*d.*; 1858, 11*s.* 8*d.* For both lights in High Tower.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,016*l.* 12*s.* 10*d.*; 1858, 670*l.* 5*s.* 2*d.* Total for 1852, 3,850*l.* 16*s.*, including the Harwich Low Lighthouse.
44. 1852, 306*l.* 3*s.* 5*d.*, including Low Light. 1858, 267*l.* 18*s.* 8*d.*, ditto. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. Committees: 1857, 15th August. 1858, 23rd April; 20th August; 14th October. Superintendent: 1857, 2nd and 28th January; 26th February; 26th March; 28th April; 30th May; 27th June; 25th July; 26th August; 25th September; 14th and 27th November. 1858, 28th January; 27th February; 25th March; 23rd April; 28th May; 28th June; 26th July; 26th August; 27th September; 29th October; 21st November; 29th December.
52. No.
53. Six lamps, with burners complete; in vault under the basement of the tower. Diameter of oil vault 15 feet; height, 14 feet.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

22.

HARWICH, HIGH.

Entrance of Harwich Harbour, South of the Town. Lower Light in High Tower.

3. The Light Committee of the Board.
4. Two in one tower; Lower, 33 feet below the Upper Light.
5. November 1664. See General Return, 19.
6. Sir William Batten, Surveyor of the Navy, and the trade to Newcastle and northern ports.
7. In consequence of extension of the "Beach End," to lead into the harbour.
8. 9th February 1848. This date refers to the exhibition of the light from its present elevation. The original High Light was shown from about the same height.
9. Builder, Mr. Lee; Engineer, Daniel Alexander. If by contract or otherwise, not known.
10. Sea light.
11. Brick, on a wood pile foundation; inner and outer wall (inner, 9 inches; outer, 12 inches; vacuity, 6 inches). Not coated, white; octagonal; gallery railing before light-room window; railing round the base of tower.
12. Dr. Faraday's.
13. 85 feet.
14. 36 feet.
15. 6½ miles.
16. 9 miles.
17. 6°. S. 22 E.; S. 28 E.
18. Fixed; red and bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric and dioptric. Argand lamp, burner ¾ of an inch, and spherical reflector; 1 section of a 1st order lens; red glass shade on the lens.
22. One burner.
23. None.
24. Robert Wilkins and Son, London.
25. None.
26. None.
27. None.
28. 15 days.
29. Not known. Built by lessee.
30. Completed.
31. No lantern. Diameter of light-room, 13 feet 6 inches; height of window, 2 feet; width of ditto, 3 feet. Cost, 23*l.* 14*s.* 1*d.*
32. 31,730*l.* 1*s.* (the two lighthouses), 1st January 1837.
33. Included in Return for the Upper Light in high tower.
34. Ditto, ditto.
35. Three for the two lighthouses; one at 65*l.* per annum, one at 46*l.* 10*s.* per annum, and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Lens adapted from an external apparatus. Lamps and frame, 13*l.* 8*s.* 4*d.* Fittings, 4*l.* 2*s.* 7*d.*
37. Included in Return for the Upper Light in High Tower.
38. Included in consumption of Upper Light in High Lighthouse.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross; cost included with Upper Light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Harwich Upper Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. See Return for Harwich Upper Light.
52. No.
53. One lamp, with burner complete; one red glass shade. Oil stored in the vault of High Tower; diameter, 15 feet; height, 14 feet.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Ditto, ditto.

23.

HARWICH, LOW.

Entrance of Harwich Harbour, South of the Town.

3. The Light Committee of the Board.
4. Two towers. N.W. by N.; S.E. by S. 213 yards.
5. November 1664. See General Return, 19.
6. Sir William Batten, Surveyor of the Navy, and the trade to Newcastle and northern ports.
7. Best position in line with High Light for leading into the harbour.
8. About 1665; 31st March 1818, from new tower as an oil light.
9. Builder, Mr. Lee; Engineer, Daniel Alexander. If by contract or otherwise, not known.
10. Sea light.
11. Brick (on a wood pile foundation); inner and outer wall (inner wall, 9 inches; vacuity, $4\frac{1}{2}$ inches; outer wall, 9 inches); not coated; white; octagonal; gallery before light-room window; railing round the base of the tower.
12. None.
13. 40 feet.
14. 25 feet.
15. $5\frac{1}{2}$ miles.
16. 10 miles.
17. 44° S. 12° E.; S. 56° E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches in diameter, 9 inches deep.
22. Three burners.
23. No alteration.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, $1\frac{1}{2}$ inch diameter over the flames of lamps, and air openings round the tower, with pipes leading to ventilator in lantern floor.
26. None.
27. None.
28. 24 days.
29. Not known; built by lessee; dwelling included in High Light Return.
30. Completed.
31. No lantern; diameter of light-room, 10 feet 6 inches; height of window, 5 feet 4 inches; width of ditto, 9 feet 2 inches.
32. $31,730$ l. s. (the two lighthouses), 1st January 1837.
33. Included in High Light (Upper) Return.
34. Included in High Light (Upper) Return.
35. Three keepers (for both lighthouses), one at 65*l.* per annum, one at 46*l.* 10*s.* per annum, and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. Included in High Light (Upper) Return.
38. 1857, oil, 92 gallons; wicks, 14 dozens. 1858, oil, 100 gallons; wicks, 23 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton; 2*s.* 6*d.* per gross. 1857, 2*s.* 11*d.* 1858, 4*s.* 9*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Harwich High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. See Return for Harwich High Light.
52. No.
53. One lamp with burner complete; in vault under basement of tower. Diameter of oil vault, 12 feet 6 inches; height of ditto, 6 feet 7 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

24.

LANGUARD FORT.

Light placed in a Window in the Barracks.

3. The Light Committee of the Board.
4. One.
5. No application; proposed by the Board in 1812 and in 1848. See General Return, 19.
6. Proposed by the Board.
7. To facilitate the navigation into Harwich Harbour.
8. 1st October 1848.
9. Not built by the Corporation.
10. Local.
11. Not known.
12. None.
13. Not known.
14. Not known.
15. Not known.
16. 4 miles.
17. 135° S. 11° W.; N. 34° W.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. Argand lamp, burner $\frac{1}{2}$ of an inch, and section of a small lenticular apparatus.
22. 6th order.
23. 1858. Green shade removed and discontinued by direction of the Board. No alteration in character.
24. R. Wilkins and Son, London.
25. Faraday's tube, $1\frac{1}{2}$ in. diameter over the flame of the lamp.
26. None.
27. None.
28. No record kept.
29. 45*l.* 14*s.* 6*d.* for preparing light-room.
30. Completed.
31. Dimensions of lightroom: height, 6 feet 1 inch; length, 21 feet; width, 8 feet 7 inches.
32. Not purchased.
33. 5*l.* 12*s.* 3*d.*
34. Nil.
35. Two, one at 52*l.*, and one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Lens adapted from old one in store; lamp and fitting, 15*l.* 10*s.* 5*d.*
37. 1857, 2*l.* 5*s.* 1*d.* 1858, 1*l.* 10*s.* 10*d.*
38. 1857, oil, 27 gallons; wicks, 4 dozen. 1858, oil, 31 gallons; wicks, 4 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 10*d.*; 1858, 10*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. No toll.
44. 1852, 111*l.* 19*s.* 9*d.* 1858, 69*l.* 2*s.* 7*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. No toll.
48. Nil.
49. Nil.
50. Committee of the Elder Brethren and Blackwall Superintendent.
51. Committee: 1858, 14th October. Blackwall Superintendent: 1857, 26th February; 28th April; 29th June; 28th October. 1858, 27th January; 28th April; 27th May; 28th June; 26th July; 27th August.
52. No.
53. Two lamps, with burners complete; in an apartment on the same floor as light-room. Height, 6 feet 1 inch; length, 8 feet 11 inches; width, 8 feet 7 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

25.

GUNFLEET.

The South-east Part of the Sand.

3. The Light Committee of the Board.
4. One.
5. January 1849. See General Return, 19.
6. James Laming.
7. The most suitable for guarding the Gunfleet Sand.
8. 1st August 1850, from a temporary lightvessel moored in nine fathoms on the northern side of the East Swin; 1st May 1856, from Pile Lighthouse.
9. Builder, George Henry Saunders; Engineer, James Walker; Superintendent of the Works, James N. Douglass. By contract.
10. Sea light.
11. Iron; on Mitchell's screw pile foundation; red; six-sided; open gallery with iron railings and flagstaff.
12. None.
13. 72 feet.
14. 41 feet.
15. 7 miles.
16. 9 miles.
17. 860°. The whole circle.
18. Revolving; red.
19. Perfect revolution in 1½ minutes, showing a flash every 30 seconds.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 2½ inches diameter, 9 inches deep. Red shades on the faces of reflectors; clockwork revolving machinery.
22. Nine burners.
23. None.
24. William Wilkins and Company, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by ventilators in lantern pedestal.
26. Bell of 3 cwt., sounded by clockwork machinery.
27. Twelve days.
28. Twelve days.
29. 14,567*l.* 7*s.* 5*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 5 feet; glass, 7 feet 6 inches; glass to vane, 12 feet 6 inches; total, 25 feet. 1,667*l.* 10*s.* 11*d.*
32. Not purchased.
33. 8*l.* 6*s.* 11*d.*
34. Nil; coated about once in two years.
35. Three; one at 60*l.*, one at 49*l.* 10*s.*, and one at 48*l.* per annum, and 1*s.* 6*d.* per diem for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. 65*l.* 16*s.* 5*d.* (including transport); fittings, 7*8*l.* 6*s.* 8*d.**
37. 1857, 4*l.* 5*s.* 5*d.*; 1858, 7*l.* 19*s.*
38. 1857, oil, 365 gallons; wicks, 71 dozen. 1858, oil, 371 gallons; wicks, 79 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 14*s.* 9½*d.*; 1858, 16*s.* 5½*d.*
41. 339*l.* 9*s.* 11*d.*
42. See Lighthouses, General Return, 19.
43. 1852, 481*l.* 4*s.* 2*d.*; 1858, 206*l.* 12*s.* 9*d.*. Total for 1852, 1,700*l.* 3*s.* 6*d.*
44. 1852, a floating light; 1858, 339*l.* 12*s.* 9*d.*. See Lighthouses, General Return, 19.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren, and Blackwall Superintendent in 1858.
51. Committees: 1857, 1st January; 7th November: 1858, 24th April; 21st August, weather prevented inspection. Superintendent: 5th February; 9th June.
52. No.
53. Three lamps, with burners complete; 3 red shades; in the apartment next living room; height, 9 feet; length, 12 feet; width, 7 feet 9 inches.
54. Aneroid barometer, with thermometer attached. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month; two of the three keepers are constantly at the lighthouse and one on shore in rotation. Relieved by sailing tender.

26.

MAPLIN.

South-east Part of the Sand.

3. The Light Committee of the Board.
 4. One.
 5. November 1837. See General Return, 19.
 6. Directors of the General Steam Navigation Company.
 7. The most suitable for guarding the Maplin Sand.
 8. 23rd July 1838, from a temporary lightvessel; 10th February 1841, from Pile Lighthouse.
 9. Builders, Alexander Mitchell (screw piles), Messrs. Gordons and Company, Messrs. Gates and Horne; Engineer, James Walker; Superintendents of the Works, James Lee and John Stretton. By contract.
 10. Sea light.
 11. Iron, on Mitchell's screw pile foundation, painted red; six-sided; open gallery with iron railing and flagstaff.
 12. Dr. Faraday's.
 13. 69 feet.
 14. 36 feet.
 15. 6½ miles.
 16. 9 miles.
 17. 252°. N. 4 E.; S. 76 W.
 18. Fixed; red and bright.
 19. Not revolving.
 20. See Lighthouses, General Return, 19.
 21. Dioptric. 6 refractors of 8 to the circle; hydraulic, three concentric wick lamp with regulating condenser; red shade outside refractors.
 22. 2nd order.
 23. 1849, Bright light opened in direction of Shivering Sand at suggestion of Deputy-Master and Inspecting Committee. No alteration in character.
 24. Refractors, Isaac Cookson and Co., Newcastle-on-Tyne; frame, lamps, &c., R. Wilkins and Son, London.
 25. Faraday's tube, ¾ inch diameter over the flame of the lamp, and ventilators in lantern pedestal.
 26. Bell of 3 cwt., sounded by clockwork machinery.
 27. Eight days.
 28. Eight days.
 29. 4,948*l.* 6*s.* 9*d.*
 30. Completed.
 31. Diameter, 12 feet 6 inches. Height: pedestal, 3 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 12 feet; total, 23 feet. 805*l.* 16*s.* 4*d.*, including fitting lighting apparatus.
 32. Not purchased.
 33. 25*l.* 17*s.* 2*d.* since construction.
 34. 17*l.* 2*s.* 6*d.*; not by contract; coated about once in two years.
 35. Three; one at 60*l.*, two at 49*l.* 10*s.*, each per annum, and 1*s.* 6*d.* per diem for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
 36. 366*l.* 11*s.* 3*d.*, fitting included in price of lantern; transport, 5*l.* 10*s.* 4*d.*
 37. 1857, 36*l.* 5*s.* 3*d.*. 1858, 16*l.* 9*s.* 4*d.*
 38. 1857, oil, 257 gallons; wicks, 22 yards. 1858, oil, 261 gallons; wicks, 24 yards.
 39. See Lighthouses, General Return, 19.
 40. Concentric cotton, 6½*d.* per yard. 1857, 11*s.* 11*d.*; 1858, 13*s.*
 41. 182*l.* 11*s.* 9*d.* (bell not new).
 42. See Lighthouses, General Return, 19.
 43. 1852, 470*l.* 5*s.* 3½*d.*. 1858, 208*l.* 18*s.* 10*d.*. Total for 1852, 1,600*l.* 5*s.* 8½*d.*
 44. 1852, 275*l.* 13*s.* 1*d.*. 1858, 322*l.* 9*s.* 4*d.*. See Lighthouses, General Return, 19.
 45. 46, 47. Nil. See Lighthouses, General Return, 19.
 - 48, 49. February 1855; wreck returns to Board of Trade from Commander Scott, transmitted by their Lordships, wherein it is stated that Mouse and Shears (Maplin) are not sufficiently strong and properly directed to guide vessels navigating that part of river Thames, masters having been unable to distinguish Mouse Light from lights shown by vessels at anchor.
- Wrecks (on the Blacktail Spit) found to have occurred in two cases during heavy snow and continual squalls from the north-east, and in the third in dull squally weather, the lead in this last case having been once only half-hour. Board of Trade informed that Elder Brethren are of opinion that losses are not attributable to inefficiency or want of strength in either of the lights mentioned or in the Nore, which are perfectly effective for the purposes intended, especially for clearing the Maplin and Blacktail Sands, provided the masters of vessels pay proper attention, but that they resulted in each case from the want of ordinary precaution and seamanship, and from recklessness in being under weigh at such times and in such weather.
50. Committees of the Elder Brethren, and by officer in charge of monthly relief.
 51. Committees, 1857, 25th January; 1858, 19th March.
 52. No.
 53. 1 lamp, 3 burners, 1 refractor, 1 reservoir, 1 receiver, 1 red shade; oil stored in room adjoining living room; diameter of oil room, 3 feet; height, 7 feet.
 54. Aneroid barometer with thermometer attached; internal thermometer and compass.
 55. See Lighthouses, General Return, 19.
 56. Ditto, ditto.
 57. Once a month; two of the three keepers are constantly at the lighthouse and one on shore in rotation. Relieved by steam vessel.

27.

CHAPMAN.

Chapman Head, Sea Reach, River Thames.

3. The Light Committee of the Board.
4. One.
5. October 1847. See General Return, 19.
6. James Laming, and masters of steam and other vessels, owners of coasters, and others interested in the navigation of the River Thames.
7. To guard the River Middle.
8. 1st October 1849, from a temporary lightvessel. August 1851, from Pile Lighthouse.
9. Builders: foundation pipes, Simpson and Co.; other castings, Fox, Henderson, and Co.; superstructure, Gates and Horne. Engineer, James Walker. Superintendent of the Works, D. Christie. By contract.
10. Sea light.
11. Iron; on Mitchell's screw pile foundation; red; six-sided, open gallery, with iron railing and flagstaff.
12. No.
13. 74 feet.
14. 40 feet.
15. 6½ miles.
16. 11 miles.
17. 180°. E. 17 S.; W. 17 N.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. Four refractors of 6 to the circle; red shade outside the refractors; fountain, three concentric wick lamp, with regulating condenser.
22. 2nd order.
23. None.
24. Refractors, Henry Lepaute, Paris. Frame, lamps, &c., W. Wilkins, London.
25. Faraday's tube, 3¼ inches diameter over the flame of the lamp, and by ventilators in the lantern-floor.
26. Bell of 3 cwt., sounded by clockwork machinery.
27. 12 days.
28. 12 days.
29. 7,110*l.* 5*s.* 10*d.*, including Mucking Lighthouse.
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet 6 inches; glass 7 feet 6 inches; glass to vane, 11 feet; total, 23 feet 2,737*l.* 9*s.* 4*d.*
32. Not purchased.
33. 19*l.* 14*s.* 4*d.* since construction.
34. 2*l.* 15*s.* 5*d.* for paint only; labour by men from the wharf at Blackwall; coated about once in two years.
35. Three; one at 60*l.*, one at 4*l.* 10*s.*, one at 4*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for living-rooms
36. 378*l.* 1*s.* 4*d.*, fitting included in price of lantern.
37. 1857, 12*l.* 11*s.* 1*d.* 1858, 15*l.* 14*s.* 8*d.*
38. 1857, oil, 272 gallons; wicks, 26 yards. 1858, oil, 273 gallons; wicks, 28 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 6½*d.* per yard. 1857, 14*s.* 1*d.*; 1858, 15*s.* 2*d.*
41. 7*l.* 8*s.* 5*d.*
42. See Lighthouses, General Return, 19.
43. 1852, 285*l.* 16*s.* 1858, 300*l.* 3*s.* 4*d.* Total for 1852, 1,662*l.* 10*s.* 6*d.* These figures include income for the Mucking Lighthouse.
44. 1852, 274*l.* 15*s.* 1858, 310*l.* 9*s.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. Committees: 1857, 9th January; 6th March; 8th May; 6th August; 5th November. 1858, 8th March; 6th May; 8th July; 3d August. Superintendent: 13th April.
52. No.
53. Three burners, one reservoir, one receiver, one red shade. Oil is stored in room next to living room. Diameter, 7 feet; height, 9 feet 3 inches.
54. Internal thermometer and compass.
55. See Lighthouses, General Return, 19.
56. Ditto. ditto.
57. Once a month; two of the three keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by steamer vessel.

28.

MUCKING.

Mucking Flat, Sea Reach, River Thames.

3. The Light Committee of the Board.
4. One.
5. October 1847. See General Return, 19.
6. James Laming, and masters of steam and other vessels, owners of coasters, and others interested in the navigation of the River Thames.
7. To clear the Scars and the Chapman Head to the east, and the Owens to the south-west.
8. 1st October 1849, from temporary lighthouse. 5th April 1851, from Pile lighthouse.
9. Builders: foundation pipes, Simpson and Co., London; other castings, Fox, Henderson, and Co., London; superstructure, Gates and Horne, London. Engineer, James Walker. Superintendents of Works, N. Douglass, J. N. Douglass. By contract.
10. Sea light.
11. Iron, on a hollow pile foundation. Black and white in alternate horizontal bands. Bridge painted white.
12. No.
13. 66 feet.
14. 40 feet.
15. 6½ miles.
16. 11 miles.
17. 185°. S. 79° E.; S. 56° W.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. Four refractors, of six to the circle; red shades outside the refractors; fountain, three-concentric wick lamp, with regulating condenser.
22. 2nd order.
23. None.
24. Refractors, Henry Lepaute, Paris. Lamps, shades, &c., Wm. Wilkins, London.
25. Faraday's tube, 3¼ inches diameter over the flame of the lamp.
26. Bell of 3 cwt., sounded by clockwork machinery.
27. 20 days.
28. 26 days.
29. Included in cost of Chapman Light. Dwellings, 1,238*l.* 6*s.* 4*d.* Site, 182*l.* 15*s.* 10*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet; glass, 7 feet 6 inches; glass to vane, 7 feet 6 inches; total, 19 feet. 2,854*l.* 0*s.* 4*d.*
32. Not purchased.
33. 29*l.* 15*s.* 6*d.* since construction.
34. 26*l.* 6*s.* 1*d.* By contract; coated about once in two years.
35. Two; one at 85*l.*, one at 40*l.* per annum, and a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 378*l.* 1*s.* 4*d.*, fitting included in price of lantern.
37. 1857, 25*l.* 19*s.* 1*d.* 1858, 24*l.* 1*s.* 11*d.*
38. 1857, oil, 206 gallons; wicks, 30 yards. 1858, oil, 205 gallons; wicks, 41 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 6½*d.* per yard. 1857, 16*s.* 3*d.*; 1858, 22*s.* 2½*d.*
41. 77*l.* 18*s.* 5*d.*
42. See Lighthouses, General Return, 19.
43. See Return for Chapman Lighthouse.
44. 1852, 194*l.* 12*s.* 1*d.* 1858, 159*l.* 17*s.* 4*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Blackwall Superintendent.
51. Committees: 1857, 8th January; 4th March; 9th May; 9th July; 6th August. 1858, 8th March; 5th May; 3rd June; 8th July; 6th and 29th August; 2nd and 25th September; 1st December. Superintendent at Blackwall: 1857, 8th March; 16th May; 4th July; 21st October. 1858, 10th May; 2nd September; 22nd October.
52. No.
53. One lamp, three burners, one receiver, one reservoir, three refractors. In room adjoining living room. Diameter, about 7 feet; height, 9 feet.
54. Internal thermometer and compass.
55. See Lighthouses, General Return, 19.
56. Ditto. ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

29.

NORTH FORELAND.

On the Head.

3. James White, Trinity Store, Ramsgate.
4. One.
5. 1634. See General Return, 19.
6. Sir John Meldrum, and masters of vessels, pilots of the Navy, and others, inhabitants of Sandwich, Dover, and other ports.
7. For leading vessels through the Downs and to entrance of the Thames.
8. About 1634, 1790, as an oil light. 26th March 1860, as a dioptric light.
9. Not known.
10. Sea light.
11. Stone, with an inner brick lining; solid wall, at base 4 feet 8 inches, at top 3 feet 9 inches; coated with cement; white; octagonal; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 92 feet.
14. 203 feet.
15. 15½ miles.
16. 20 miles.
17. 260°. N. 50. W.; S. 30. W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 6 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors, and 2 spherical reflectors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 1860, dioptric substituted for catoptric apparatus of 18 Argand lamps and reflectors, by direction of the Board. No alteration in "character."
24. Optical parts, Sautter, Paris; frame, lamps, reflectors, &c., William Wilkins and Company, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp.
26. None.
27. None.
28. 26 days.
29. Not known.
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 5 feet; glass, 10 feet; glass to vane, 13 feet; total, 28 feet. 1,235*l.* 10s.
32. Purchased, with the two South Foreland Lighthouses, for 8,399*l.* 16s., July 1832.
33. 2*l.* 7s. 2*d.* since 1832.
34. 2*l.* 6s. 3*d.*; not by contract; once in four years.
35. Two; one at 65*l.* per annum and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,018*l.* 10s., including all charges.
37. 1857, 14*l.* 16s. 4*d.*, for catoptric apparatus. 1858, 7*l.* 11s. 8*d.*, ditto.
38. 1857, oil, 714 gallons; wicks, 113 dozen; by the catoptric light. 1858, oil, 703 gallons; wicks, 130 dozen, ditto.
39. See Lighthouses General Return, 19.
40. Argand cotton, 2s. 6*d.* per gross. 1857, 1*l.* 3s. 6½*d.*, for the catoptric light. 1858, 1*l.* 7s. 1*d.*, ditto.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,478*l.* 7s. 9*d.*. 1858, 1,149*l.* 15s. 6*d.*. Total for 1852, 5,298*l.* 16s. 6*d.* (includes the two South Foreland Lighthouses.)
44. 1852, 301*l.* 2s. 7*d.*. 1858, 238*l.* 17s. 0*d.*. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 2nd April; 22nd June; 5th September. 1858, 7th March; 20th April; 1st May. Agent: 2nd and 29th February; 24th March; 23rd June; 25th September; 23rd October; 23rd December. 1858, 24th March; 16th June; 25th September; 9th November; 28th December.
52. No.
53. Under the basement of tower; length of oil cellar, 18 feet 9 inches; breadth, 9 feet 8 inches; height, 8 feet 3 inches.
54. Barometer, with thermometer attached. External and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

30.

SOUTH FORELAND, HIGH.

On the Head, 2¾ miles from Dover.

3. James White, Trinity Store, Ramsgate.
4. Two. E. by S.; W. by N. 449 yards.
5. 1634. See General Return, 19.
6. Sir John Meldrum, and masters of vessels, pilots of the Navy, and others, inhabitants of Dover and other ports.
7. For leading vessels clear of the Goodwin Sands, through the Downs, and up and down Channel.
8. About 1634, 1793, as an oil light. 2nd May 1843 as a dioptric light. Tower raised, and partly rebuilt, 1841-2.
9. Builders, Messrs. Bushell and Denny; Engineer, James Walker; Superintendent of Works, — Garrett; this applies to the rebuilding.
10. Sea light.
11. Stone; solid wall, not coated; at base, 6 feet; at top, 3 feet. White, square castellated tower.
12. Dr. Faraday's.
13. 69 feet.
14. 372 feet.
15. 20½ miles.
16. 27 miles.
17. 246°. N. 11 E.; S. 77 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 6 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors, and 2 spherical reflectors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 1851, zones (as above) substituted for mirrors, by direction of the Board. 1852, spherical reflectors, by direction of the Board. No alteration in "character."
24. Optical parts, Henry Lepaute, Paris; frame, lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and by openings in the lantern pedestal.
26. None.
27. None.
28. 45 days.
29. Lighthouse not known. 1841, rebuilt, 1,068*l.* 15s. 9*d.* 1843, dwellings, and alteration to towers of High and Low Lights, 4,409*l.* 4s. 3*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 7 feet 6 inches; glass, 10 feet; glass to vane, 11 feet; total, 28 feet 6 inches. 1,828*l.* 17s.
32. 8,399*l.* 16s. (three lighthouses), July 1832.
33. 30*l.* 17s. 10*d.*, including Low Light, since 1892.
34. 2*l.* 11s. 8*d.*, including Low Light. Not by contract; once in four years.
35. Two; one at 46*l.* 10s. per annum, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,003*l.*; 51*l.* 12s.; 28*l.* 9s. 11*d.*
37. 1857, 23*l.* 4s. 9*d.*, including Low Light. 1858, 14*l.* 10s. 4*d.*, ditto.
38. 1857, oil, 511 gallons; wicks, 60 yards. 1858, oil, 494 gallons; wicks, 54 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7*d.* per yard. 1857, 1*l.* 17s. 6*d.*; 1858, 1*l.* 13s. 9*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for North Foreland Light.
44. 1852, 467*l.* 0s. 8*d.*; 1858, 569*l.* 14s. 10*d.*, including Low Light. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 25th February; 22nd June. 1858, 9th and 11th December. Agent: 12th and 25th March; 26th June; 28th September; 5th November; 28th December. 1858, 27th February; 27th March; 29th June; 9th and 29th September; 24th December.
52. No.
53. Two burners, one reservoir, one receiver, one refractor, on the basement floor of lighthouse. Diameter of oil cellar, 15 feet; height of ditto, 8 feet.
54. Barometer, with thermometer attached. External and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

31.

SOUTH FORELAND, LOW.

On the Head, 3 miles from Dover.

3. James White, Trinity Store, Ramsgate.
4. Two. E. by S.; W. by N. 449 yards.
5. 1634. See General Return, 19.
6. Sir John Meldrum, and masters of vessels, pilots, and others, inhabitants of Dover and other ports.
7. For leading vessels clear of the Goodwin Sands, through the Downs, and up and down Channel.
8. About 1634; 1795 as an oil light; 1846 from present tower.
9. Builder (of present tower), H. P. McKenzie; Engineer, James Walker; Superintendent of Works, Joshua Robinson. By contract.
10. Sea light.
11. Stone, inner and outer wall; vacuity, 4 inches; inner wall 9 inches; outer wall, 3 feet 8 inches, 3 feet 2 inches, 3 feet. Wall at level of lantern floor under gallery, solid, 2 feet 6 inches in depth. Not coated; painted white; an octagonal castellated tower.
12. Dr. Faraday's.
13. 49 feet.
14. 275 feet.
15. 17½ miles.
16. 24 miles.
17. 199°. N. 56 E.; S. 75 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 15 burners.
23. No alteration.
24. R. Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps. No other mode.
26. None.
27. None.
28. 45 days.
29. 2,664*l.* 10*s.* 4*d.*, exclusive of site, which was purchased with the three lighthouses (see No. 32); dwellings included in S.F. High Light Return.
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 6 feet 6 inches; glass, 10 feet; glass to vane, 11 feet; total, 27 feet 6 inches. Price 94*l.* 16*s.* 3*d.*, which includes the cost of fitting and transporting of the illuminating apparatus.
32. 3,399*l.* 16*s.* (for the three lighthouses), July 1832.
33. Included in South Foreland High Light Return.
Ditto, ditto.
35. Two; one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 379*l.* 2*s.* 6*d.*, exclusive of cost of fitting and transport (see No. 31.)
37. Included in South Foreland High Light Return.
38. 1857, oil, 647 gallons; wicks, 144 dozen. 1858, oil, 648 gallons; wicks, 125 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 10*s.* 1858, 1*l.* 6*s.* 0*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for North Foreland Light.
44. See Return for South Foreland High Light.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 12th June. 1858, 28th May, 18th September, 3rd November. Agent: 1857, 12th and 25th March, 26th June, 28th September, 5th November, 24th December. 1858, 27th March, 15th April, 29th June, 9th and 29th September, 24th December.
52. No.
53. Two lamps, with burners complete; on the basement floor of the tower. Diameter of oil room, 13 feet 8 inches; height of ditto, 7 feet 6 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

32.

DUNGENSESS.

Extreme of the Point.

3. James White, Trinity Store, Ramsgate.
4. One.
5. Before 1615; exact date not known. See General Return, 19.
6. Sir Edwd. Hayward, and merchants and others interested in the navigation.
7. To mark the low point of Dungeness.
8. 1615; rebuilt 1792. 23rd February 1792, as an oil light.
9. Builder not known; built by private proprietor. Engineer, Samuel Wyatt. Whether by contract or otherwise, not known.
10. Sea light.
11. Brick; solid wall; at base, 4 feet 1 inch, at top, 1 foot 7 inches; coated with cement; red; circular; lantern gallery, with iron railing.
12. Dr. Faraday's.
13. 108 feet.
14. 92 feet.
15. 10½ miles.
16. 15 miles.
17. 256°. N. 50 E.; N. 52 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 18.
23. No alteration in character. 1860, dioptric apparatus of the 1st order will be fitted by direction of the Board.
24. Reflectors, George Robinson, London; lamps, &c., R. Wilkins, and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by air openings through the pedestal and centre of lantern floor.
26. None; bell intended to be fitted.
27. None.
28. 15 days.
29. Not known; built by private proprietor.
30. Completed.
31. Diameter, 16 feet 9 inches. Height: pedestal, 4 feet; glass, 5 feet 2 inches; glass to vane, 10 feet 3 inches; total, 19 feet 5 inches. Not known.
32. 20,954*l.* 2*s.* 5*d.*; 1st January, 1837.
33. 20*l.* 6*s.* 8*d.* since 1835.
34. 2*l.*; not by contract; once in four years.
35. Two; one at 65*l.* per annum and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. 1857, 9*l.* 8*s.* 2*d.* 1858, 39*l.* 0*s.* 2*d.*
38. 1857, oil, 638 gallons; wicks, 141 dozen. 1858, oil, 645 gallons; wicks, 117 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 9*s.* 4*d.* 1858, 1*l.* 4*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 1,076*l.* 12*s.* 11*d.* Midsummer quarter, 1858, 922*l.* 4*s.* 11*d.* Total for 1852, 4,107*l.* 13*s.* 2*d.*
44. 1852, 208*l.* 0*s.* 3*d.* 1858, 254*l.* 19*s.* 11*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committee of the Elder Brethren in 1838, and by Agent in 1857 and 1858.
51. Committees: 1857, Nil. 1858, 10th December. Agent: 1857, 13th and 27th March, 19th and 22nd May, 5th and 25th June, 27th July, 26th August, 26th September. 1858, 25th March, 21st May, 25th August, 25th October, 29th December.
52. No.
53. Two lamps, with burners complete; two burners on the ground floor of the tower. Diameter of oil cellar, 23 feet 6 inches; height of ditto, 13 feet 6 inches.
54. Barometer with thermometer attached; external and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

33.

BEACHY HEAD.

Belletoute Cliff, 300 feet below the Summit of the Head and 96½ feet distant from the Edge of the Cliff.

3. Capt. James Hewett, R.N., Eastbourne, Sussex.
4. One.
5. First, 1670; renewed in 1812 and 1826. See General Return, 19.
6. 1670, John William Russell, Silas Titus, and Edward Andrews. 1812, Capt. Harvey, R.N., (through the Admiralty). 23rd December 1826; Capt. Mingaye, R.N., and Thomas Bayley, Pilot of Deal.
7. To mark the headland and clear the shoals to the eastward.
8. 1st October 1828, from a temporary wooden building; 11th October 1834, from the present lighthouse.
9. Builder, William Hallett; Engineer, James Walker; Superintendent of the Works, George Burrell. By contract.
10. Sea light.
11. Stone, with facing of granite; solid wall, at base 3 feet 9 inches, at top 3 feet; not coated; white; circular. Lantern gallery with iron railings.
12. Dr. Faraday's.
13. 47 feet.
14. 235 feet.
15. 18 miles.
16. 23 miles.
17. 1859. S. 53 E., N. 48 W.
18. Revolving; bright.
19. Perfect revolution in six minutes, showing the full arc of the reflectors every two minutes, and a flash every fifteen seconds.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clock-work revolving machine.
22. Thirty burners.
23. No alteration.
24. Reflectors, revolving machine, &c., Robinson & Wilkins, London. Lamps, &c., R. Wilkins & Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and openings round pedestal and in the roof of the lantern.
26. None.
27. None.
28. 39 days.
29. In 1828, 4,482*l.* 13*s.* 7*d.* including lantern and apparatus. Alterations in 1835, including all charges, 3,324*l.* 0*s.* 1*d.*
30. Completed.
31. Diameter, 13 feet 6 inches. Height: pedestal, 4 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 10 feet; total, 22 feet. Included in No. 29.
32. Not purchased.
33. 29*l.* 9*s.* 5*d.* since construction.
34. 18*l.* 4*s.* 1*d.*; not by contract; once in four years.
35. Two; one at 6*s.* and one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in No. 29.
37. 1857, 91*l.* 15*s.* 10*d.* 1858, 16*l.* 16*s.* 10*d.*
38. 1857, oil, 981 gallons; wicks, 183 dozen. 1858, oil, 1,004 gallons; wicks, 231 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 13*s.* 1½*d.* 1858, 2*l.* 8*s.* 1½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 966*l.* 10*s.* 9½*d.* 1858, 917*l.* 16*s.* 2*d.* Total for 1852, 3,893*l.*
44. 1852, 420*l.* 4*s.* 7*d.* 1858, 417*l.* 11*s.* 3*d.* See Lighthouses, General Return, 19.
- 45, 46, 47, Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 12th June, 1st July. 1858, 27th May. Agent: 1857, 1st and 15th January; 1st and 12th February; 1st and 14th March; 1st and 15th April; 1st and 15th May; 1st and 14th June; 1st and 15th July; 1st and 15th August; 1st and 15th September; 1st and 14th October; 1st and 12th November. 1858, 1st and 16th January; 1st and 14th February; 1st and 14th March; 1st and 11th April; 2nd and 13th May; 1st and 17th June; 1st and 12th July; 1st and 16th August; 1st and 14th September; 1st and 13th October; 1st and 16th November; 1st and 16th December.
52. No.
53. Seven lamps, with burners complete; in the basement of the tower; diameter of oil cellar, 10 feet 8 inches; height, 9 feet.
54. Barometer, with thermometer attached. External and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

34.

ST. CATHERINE'S.

On the Point.

3. Robert Willis, East Cowes, Isle of Wight.
4. One.
5. December, 1780. See General Return, 19.
6. 1780, William Tatnall, junior, and the trade using or interested in the navigation of the English Channel.
7. Southernmost point of the island considered the best lighthouse.
8. 1st March 1840.
9. Builder, Thomas Dashwood, Ryde, Isle of Wight; Engineer, James Walker, London. Superintendent of Works, — Adie. By contract.
10. Sea light.
11. Stone; solid wall, at base 4 feet 6 inches, at top 2 feet; not coated; white; octagonal with turreted parapet.
12. Dr. Faraday's.
13. 122 feet.
14. 178 feet.
15. 14½ miles.
16. 19 miles.
17. 221°. S. 79 E., N. 38 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 6 refractors of 10 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors, and 4 spherical reflectors completing the circle. Fountain, 4 concentric wick lamp, and regulating condenser.
22. 1st order.
23. 1849, zones substituted for mirrors by direction of the Board. No alteration in character.
24. Refractors, J. Cookson and Company, Newcastle. Zones, Henry Lepaute, Paris. Frame, reflectors, lamps, &c., R. Wilkins and Son.
25. Faraday's tube, 4½ inches diameter over the flame of the lamps, and ventilators round lantern pedestal.
26. None.
27. None.
28. 76 days.
29. Lighthouse and adjoining buildings, 7,673*l.* 17*s.* 2*d.* Site, 182*l.* 0*s.* 8*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 7 feet; glass, 10 feet; glass to vane, 11 feet; total, 28 feet. Price 1,882*l.* 15*s.* 3*d.*
32. Not purchased.
33. 29*l.* 15*s.* 2*d.* since construction.
34. 23*l.* 9*s.* 6*d.*; not by contract; once in four years.
35. Two; one at 6*s.*, one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,222*l.* 6*s.* 8*d.*; 99*l.* 7*s.*; 41*l.* 16*s.* 3*d.*
37. 1857, 22*l.* 12*s.* 9*d.* 1858, 13*l.* 8*s.* 10*d.*
38. 1857, oil, 404 gallons; wicks, 23 yards. 1858, oil, 431 gallons; wicks, 23 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 17*s.* 6*d.* 1858 17*s.* 6*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for the Needles Light.
44. 1852, 245*l.* 11*s.* 1*d.* 1858, 212*l.* 5*s.* 6*d.* See Lighthouses, General Return, 19.
- 45, 46, 47, Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 6th August. 1858, 28th April; 28th September; 11th June, weather prevented a landing. Agent: 1857, 25th March; 24th June; 5th September; 7th November. 1858, 22nd and 26th February; 12th June; 16th July; 29th August; 29th September; 19th November.
52. No.
53. 1 lamp, 3 burners; in the basement of tower; diameter of oil cellar, 14 feet; height, 9 feet.
54. Barometer, with thermometer attached. External and internal thermometer and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

35.

NEEDLES.

West End of the Outer Needle Rock.

3. Robert Willis, East Cowes, Isle of Wight.
4. One light.
5. December 1780. See General Return, 19.
6. William Tatnall, jun., and Stephen Mignan, and the trade sang or inter-acted in the navigation of the British Channel.
7. To mark the entrance of the Needles Channel, and in substitution of light on the Isle of Wight, frequently obscured by fog.
8. 29th September 1786, from the Point; rebuilt 1854-58; 1st January 1859, from the present tower.
9. Engineer, James Walker; Superintendent of the Works, Thomas Orniston; contract for stone only (De Lank Granite Company).
10. Sea light.
11. Granite; solid wall, at base 3 feet 6 inches, at top 2 feet; not coated nor coloured; circular; open gallery, no railing.
12. Dr. Faraday's.
13. 108 feet.
14. 80 feet.
15. 9½ miles.
16. 9 miles.
17. 290°, N. 68 E., S. 42 E.
18. Fixed; red and bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric, 7 refractors, 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors, and 2 sections of circles of red shades outside the lens and zones; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 1859, dioptric, substituted for catoptric apparatus, of 13 Argand lamps and refractors, by direction of the Board. No alteration in character.
24. Optical parts, Henry Lepaute, Paris. Frame, lamps, shade, &c., William Wilkins and Company, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and by openings in lantern pedestal.
26. Bell of 3 cwt., sounded by clockwork machinery.
27. Not in use till 1859.
28. 75 days; this applies to the light on the Point.
29. 19,830*l.* 5*s.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 10 feet; glass to vane, 14 feet; total height, 28 feet 6 inches. Price 1,382*l.* 19*s.* 3*d.*
32. Not purchased.
33. No average yet obtained. Old light, 46*l.* 12*s.* since construction.
34. Not yet painted or coloured since construction.
35. Three; one at 60*l.* per annum, one at 49*l.* 10*s.* per annum, and one at 48*l.* per annum; 1*s.* 6*d.* per diem for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. 1,087*l.* 10*s.*, including all charges.
37. Not exhibited in those years from present tower.
38. 1857, oil, 551 gallons; wicks, 173 dozen, by the catoptric light. 1858, oil, 538 gallons; wicks, 179 dozen, ditto.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 16*s.* 0*d.* 1858, 1*l.* 17*s.* 3*d.*, for the catoptric light.
41. 244*l.* 15*s.* 6*d.*
42. See Lighthouses, General Return, 19.
43. 1852, 1,025*l.* 16*s.* 8½*d.* 1858, 1,883*l.* 15*s.* 5*d.* Total for 1852, 7,879*l.* 4*s.* 6½*d.* (includes the Saint Catherine's and two Hurst Lighthouses).
44. Not exhibited in those years from present tower. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. 1st January 1859. Hydrographer, Admiralty, observed that proposed bearing of white light to W.¼ N. passes within one mile of Durlstone Head, suggests W.¼ S., or other alteration. This was an error in the preliminary notice; limit of W.¼ N. closer to Durlstone Head than was intended, light actually bears to due west. Notice to that effect issued on exhibition of light.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 25th April; 10th June. 1858, 3rd March; 10th June; 21st October. Agent: 21st February; 27th March; 18th June; 19th October; 26th December. 1858, 11th March; 28th June; 24th September; 10th December. These inspections apply to the light on the Point.
52. No.
53. 5 lamps, with burners complete, 2 reservoirs, 2 receivers, 2 sets of red shades; oil is stored in the basement of tower; diameter of oil cellar, 14 feet 10 inches; height of ditto, 10 feet 8 inches.
54. Barometer with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month; two of the three keepers are constantly at the lighthouse, and one on shore in rotation; relieved by sailing tender.

36.

HURST, HIGH.

The Beach of Hurst Point.

3. Robert Willis, East Cowes, Isle of Wight.
4. Two; N.E. by E. ½ E., S.W. by W. ½ W.; 252 yards; 25 feet above the lower light in the Low Lighthouse.
5. No application. See General Return, 19.
6. No application.
7. Leading mark with the Low Light over the bridge through the Needles Channel to Hurst Point.
8. 27th August 1812.
9. Builder, Wm. Colborne, Lymington; Engineer, Daniel Alexander; by contract.
10. Sea light.
11. Brick; solid wall, at base 2 feet 9 inches, at top 1 foot 6 inches; coated with cement; red; conical.
12. Dr. Faraday's.
13. 87 feet.
14. 76 feet.
15. 9½ miles.
16. 13 miles.
17. 230°, S. 50 W., S. 73 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 21 inches in diameter, 9 inches deep.
22. Three burners.
23. No alteration.
24. Reflectors and frame, G. Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1½ in. diameter over the flames of the lamps, and by openings in the lower part of the lightroom.
26. None.
27. None.
28. 24 days.
29. Dwellings, 1,563*l.* 9*s.* 1*d.* Lighthouse included in building Hurst Low and Old Needles Light.
30. Completed.
31. Diameter (of lightroom) 8 feet 6 inches; height, 11 feet; height of window, 4 feet 3 inches; width of ditto, 3 feet 6 inches.
32. Not purchased.
33. 60*l.* 11*s.* 6*d.*, including low light.
34. 5*l.* 8*s.* 10*d.*; not by contract; once in four years.
35. Three (for both lighthouses): one at 65*l.* per annum, one at 46*l.* 10*s.* per annum, and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Cannot be ascertained.
37. 1857, 9*l.* 8*s.* 5*d.*; 1858, 5*l.* 16*s.* 10*d.*, including low light.
38. 1857, oil, 129 gallons; wicks, 22 dozen. 1858, oil, 129 gallons; wicks, 24 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 4*s.* 7*d.* 1858, 5*s.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for the Needles Light.
44. 1852, 558*l.* 15*s.* 9*d.* for Needles, Hurst High, and Hurst Low Lights. 1858, 580*l.* 18*s.* 10*d.*, ditto. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th June; 1st July. 1858, 29th April. Agent: 21st February; 27th March; 18th June; 7th July; 15th and 28th September; 26th December. 1858, 11th and 27th March; 8th May; 11th and 28th June; 7th and 24th September; 22nd November; 27th December.
52. No.
53. Two lamps, with burners complete; in the basement of the tower; diameter of oil cellar, 13 feet; height of ditto, 8 feet.
54. Barometer, with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

37.

HURST, LOW.

The Beach of Hurst Point, Lower Light in Low Tower.

3. Robert Willis, East Cowes, Isle of Wight.
4. Two in one tower; lower 20 feet below the upper light.
5. December 1780. See General Return, 19.
6. Wm. Tatnall, junior, and Stephen Mignan, and a numerous body of merchants, owners and masters of vessels.
7. Leading mark with the high light, over the bridge, through the Needles Channel to Hurst Point.
8. 29th September 1786.
9. Builder, Thos. Colborne, Lymington. Engineer, R. Jupp, London.
10. Sea light.
11. Brick; solid wall, at base 3 feet, at top 2 feet 3 inches; coated with cement; red; lantern gallery with iron bars.
12. Dr. Faraday's.
13. 60 feet.
14. 29 feet.
15. 5½ miles.
16. 10 miles.
17. 30°. S. 47 W.; S. 77 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¼ of an inch, and parabolic reflectors 2½ inches diameter, 9 inches deep.
22. Three burners.
23. No alteration.
24. Reflectors and frame, George Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1¼ inch diameter over flames of the lamps.
26. None.
27. None.
28. 13 days.
29. See Return for Hurst High Light.
30. Completed.
31. Lightroom window (on third stage of low tower), height, 4 feet; width, 5 feet.
32. Not purchased.
33. Included in High Light Return.
34. Ditto, ditto.
35. Three (for both lighthouses), one at 65*l.*, one at 46*l.* 10*s.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
- 36, 37. See Return for Hurst High Light.
38. 1857, oil, 172 gallons; wicks, 19 dozen (for both lights in low tower). 1858, oil, 164 gallons; wicks, 19 dozen (ditto).
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 3*s.* 11½*d.* 1858, 3*s.* 11½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for the Needles Light.
44. Included in Return for Hurst High Light. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th June, 1st July. 1858, 29th April. Agent: 1857, 21st, 26th February, 27th March, 18th, 25th June, 7th July, 16th, 28th September, 19th October; 26th December. 1858, 11th, 27th March, 8th May, 11th, 28th June, 7th, 24th September, 22nd November, 27th December.
52. No.
53. Two lamps, with burners complete (for both lights in low tower); in the basement of tower; diameter, 7 feet; height, 9 feet.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

38.

HURST, LOW.

The Beach of Hurst Point, Upper Light in Low Tower.

3. Robert Willis, East Cowes, Isle of Wight.
4. Two towers; N.E. by E. ½ E., S.W. by W. ½ W.; 252 yards: two lights in the low tower, upper 20 feet above the lower light.
5. No application; proposed by the Board. See General Return, 19.
6. No application.
7. For leading up the Solent.
8. 27th August 1812.
9. Builder, Thos. Colborne, Lymington. Engineer, R. Jupp, London.
10. Sea light.
11. Brick; solid wall, at base 3 feet, at top 2 feet 3 inches; coated with cement; red; lantern gallery with iron bars.
12. Dr. Faraday's.
13. 60 feet.
14. 49 feet.
15. 7½ miles.
16. 11 miles.
17. 34°. S. 73 W., N. 73 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamp, burner ¼ of an inch, and parabolic reflector 2½ inches diameter, 9 inches deep.
22. One burner.
23. No alteration.
24. Reflector and frame of apparatus, George Robinson, London. Lamp, &c., R. Wilkins and Son, London.
25. Faraday's tube, 1¼ inch in diameter over the flame of lamp, and by openings in the pedestal of the lantern.
26. None.
27. None.
28. 13 days.
29. See Return for Hurst High Light.
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 2 feet 4 inches; glass, 4 feet 2 inches; glass to vane, 11 feet. Total height, 17 feet 6 inches.
32. Not purchased.
33. Included in High Light Return.
34. Ditto, ditto.
35. Three (for both lighthouses), one at 65*l.*, one at 46*l.* 10*s.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. See Return for Hurst High Light.
37. Included in High Light Return.
38. Included in consumption of Lower Light in Low Lighthouse.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. Cost included with Lower Light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for the Needles Light.
44. See Return for the Hurst High Light.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th June, 1st July. 1858, 29th April. Agent: 1857, 21st, 26th February, 27th March, 18th, 25th June, 7th July, 16th, 28th September, 19th October, 26th December. 1858, 11th, 27th March, 8th May, 11th, 28th June, 7th, 24th September, 22nd November, 27th December.
52. No.
53. Two lamps, with burners complete (for both lights in low tower). In the basement of tower. Diameter of oil cellar, 7 feet; height of ditto, 9 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

39.

PORTLAND, HIGH.

Bill of Portland.

3. Robert Willis, East Cowes, Isle of Wight.
4. Two; N.N.W. $\frac{1}{2}$ W., S.S.E. $\frac{1}{2}$ E.; 503 yards.
5. February 1699; renewed 5th May 1715. See General Return, 19.
6. Captain Holman and the Corporation of Weymouth, and the trade to the westward. Renewed application by Robert Weare and William Borrett, junr.
7. To lead, in combination with the Low Light, between the Race and Shambles.
8. 1716. August 1788 as an oil light.
9. Not known; built by lessees.
10. Sea light.
11. Stone; solid wall, at base 2 feet 3 inches, at top 1 foot 10 inches; not coated; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 36 feet.
14. 222 feet.
15. 15 $\frac{1}{2}$ miles.
16. 21 miles.
17. 265°. N. 69 E., N. 26 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 17 burners.
23. No alteration.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, 1 $\frac{1}{2}$ inches diameter over the flames of the lamps, also ventilators connected with the outside and in the floor of the lantern.
26. None.
27. None.
28. 36 days.
29. Not known.
30. Completed.
31. Diameter, 10 feet 3 inches. Height: pedestal, 3 feet 9 inches; glass, 6 feet; glass to vane, 6 feet 3 inches; total, 16 feet. Price not known.
32. Not purchased. Lease expired 10th October 1777.
33. 4*l.* 13*s.* 1*d.* since 1822, including the Low Light.
34. 27*l.* 11*s.* 11*d.*, including the Low Light. Not by contract; once in four years.
35. Two; one at 65*l.* per annum, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. 1857, 20*l.* 6*s.* 1*d.*, including Low Light. 1858, 21*l.* 6*s.* 3*d.*, ditto.
38. 1857, oil, 790 gallons; wicks, 139 dozen. 1858, oil, 796 gallons; wicks, 125 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 8*s.* 11*d.* 1858, 1*l.* 6*s.* 0*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, quarter, 1,019*l.* 14*s.* 11*d.* 1858, quarter, 985*l.* 14*s.* 2*d.* Total for 1852, 4,123*l.* 9*s.* 2*d.*
44. 1852, 508*l.* 17*s.* 6*d.*, including Low Light. 1858, 656*l.* 1*s.* 6*d.*, ditto. See Lighthouses, General Return, 19.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
46. In December 1858, the Board of Trade sanctioned expenditure of lightvessel off Shambles, but in doing so suggested whether, when the lightvessel was so placed, one of the lights on the Bill of Portland might not be dispensed with. Their Lordships were acquainted that the purpose served by the two lights at Portland is not only that of giving them a distinctive character, but also that of leading vessels with the lights in one between the Shambles and the Race, which channel is now much frequented, and would be rendered no longer available during the night by the discontinuance of one of the lights. January 1859, their Lordships rejoin that they are still of opinion that it is not necessary to have leading lights to clear a danger as well as a lightship on that danger, but that, as Elder Brethren consider it important to retain both the Portland lights, they do not desire to press the objection.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 11th June. 1858, 27th May. Agent: 1857, 6th and 25th March; 26th June; 25th September; 13th November. 1858, 23th March; 25th June; 15th July; 27th September; 23rd November.
52. No.
53. Four lamps, with burners complete. Lower room of the light-house. Diameter of oil room, 13 feet 6 inches; height, 13 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto. ditto.
57. Not relieved.

40.

PORTLAND, LOW.

Bill of Portland.

3. Robert Willis, East Cowes, Isle of Wight.
4. Two; N.N.W. $\frac{1}{2}$ W., S.S.E. $\frac{1}{2}$ E. 503 yards.
5. February 1699; renewed May 1715. See General Return, 19.
6. Captain Holman and the Corporation of Weymouth, and the trade to the westward; renewed application by Robert Weare and W. Borrett, junr.
7. To lead, in combination with the High Light, between the Race and Shambles.
8. 1716; rebuilt 1789. 22nd October 1789, as an oil light from new tower.
9. Builder, William Johns, Weymouth; Engineer, not known. By contract.
10. Sea light.
11. Portland stone; solid wall, at base 3 feet, at top 2 feet 6 inches. Diameter of tower (outside), at base 20 feet, at top 10 feet. Not coated; white; conical; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 82 feet.
14. 145 feet.
15. 12 $\frac{1}{2}$ miles.
16. 18 miles.
17. 229°. N. 70 E.; N. 61 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 15 burners.
23. No alteration.
24. Reflectors and frame, Robinson and Wilkins, London; lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 11 inches diameter over the flames of the lamps.
26. None.
27. None.
28. 18 days.
29. Not known.
30. Completed.
31. Diameter, 10 feet. Height: pedestal, 3 feet; glass, 6 feet; glass to vane, 9 feet; total, 18 feet. Price not known.
32. Not purchased; lease expired 1777.
33. Included in High Light Return.
34. Ditto, ditto.
35. Two; one at 65*l.* per annum, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. Included in High Light Return.
38. 1857, oil, 642 gallons; wicks, 114 dozen. 1858, oil, 661 gallons; wicks, 117 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 8*s.* 9*d.* 1858, 1*l.* 4*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Portland High Light.
44. Ditto, ditto.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
48. See Return for Portland High Light.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 11th June. 1858, 27th May. Agent: 1857, 6th and 25th March; 26th June; 25th September; 13th November. 1858, 23th March; 25th June; 15th July; 27th September; 23rd November.
52. No.
53. Four lamps, with burners complete. Lower room of the light-house. Diameter of oil room, 13 feet 6 inches; height, 13 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto. ditto.
57. Not relieved.

41.

ST. PETER'S (Caskets).

The Highest of the Casket Rocks.

3. T. N. Barbensen, Alderney.
4. Three, triangular. St. Peter's N.W. $\frac{1}{2}$ W. 24 yards from St. Thomas, and W. $\frac{1}{2}$ S. 62 yards from Dungeon.
5. 7th November 1722. See General Return, 19.
6. M. Le Cocq and about 800 traders of London and the outports. See Lighthouses, General Return, 19.
7. To mark the southern side of the English Channel.
8. 30th October 1724 (O.S.) as a coal fire; 25th November 1790, as an oil light.
9. Not known; built by lessee, M. Le Cocq; raised 30 feet in 1854. Builders, Messrs. Jackson and Bean; Engineer, James Walker. By contract.
10. Sea light.
11. Rubblestone; rough cast outside, solid walls, 5 feet; coated with cement; white; circular in a battering form; stone lantern gallery.
12. Dr. Faraday's.
13. 68 feet.
14. 113 feet.
15. 11½ miles.
16. 16 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. Perfect revolution in one minute, showing a flash every 20 seconds.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clockwork revolving machine.
22. 12 burners.
23. None.
24. William Wilkins and Co., London.
25. Faraday's tubes, 1½ inches diameter over the flames of the lamps; no other mode.
26. None at St. Peter's. (See Dungeon.)
27. None.
28. 13 days.
29. Original cost not known. Raising tower, 4,748*l.* 17*s.* 6*d.*; dwellings, 1,917*l.* 9*s.* 10*d.*, including St. Thomas and Dungeon.
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 5 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 11 feet 6 inches; total, 24 feet 6 inches. 3,164*l.* 0*s.* 11*d.*, including St. Thomas and Dungeon Tower.
32. Not purchased; lease expired 1785.
33. 64*l.* 7*s.* 2*d.* since 1822, including St. Thomas and Dungeon Towers.
34. 2*l.* 18*s.* 9*d.*; only once painted externally, at a cost of 24*l.* 16*s.* 11*d.* the three light towers; not by contract; in future once in four years.
35. Four (for the three lights); one at 60*l.*, and three at 49*l.* 10*s.* per annum; 1*s.* 6*d.* per diem per man for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Not known.
37. 1857, 67*l.* 15*s.* 9*d.*, including St. Thomas and Dungeon Towers. 1858, 79*l.* 0*s.* 3*d.*, ditto.
38. 1857, oil, 1,375 gallons; wicks, 250 dozen; 1858, oil, 1,320 gallons; wicks, 216 dozen; for the three lights.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 2*l.* 12*s.* 1*d.*; 1858, 2*l.* 5*s.*; for the three lights.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, Midsummer quarter, 1,032*l.* 8*s.* 5*d.* 1858, ditto, 993*l.* 3*s.* 7*d.* Total for 1852, 4,170*l.* 0*s.* 3*d.*
44. 1852, 624*l.* 18*s.* 2*d.* 1858, 900*l.* 12*s.* 8*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren in 1857 and 1858. Agent not required to visit except under special circumstances.
51. Committees: 1857, 10th August. 1858, 27th May; (7th August, weather prevented a landing.) 10th August.
52. No.
53. Four lamps, with burners complete; in basement of the tower. Diameter of oil cellar, 52 feet 6 inches; height, 8 feet.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month; three of the four keepers are constantly at the lighthouses, and one on shore in rotation; relieved by hired cutter.

42.

ST. THOMAS (Caskets).

The Highest of the Casket Rocks.

3. T. N. Barbensen, Alderney.
4. Three, triangular. St. Thomas S.W. $\frac{1}{2}$ W. 46 yards from Dungeon, and S.E. $\frac{1}{2}$ E. 24 yards from St. Peter's.
5. 7th November 1722. See General Return, 19.
6. M. Le Cocq, and about 800 of the principal traders of London and the outports. See Lighthouses, General Return, 19.
7. To mark the south side of the English Channel.
8. 30th October 1724 (O.S.) as a coal fire. 25th November 1790 as an oil light.
9. Not known; built by lessee; tower raised 30 feet in 1854. Builders, Jackson and Bean; Engineer, James Walker. By contract.
10. Sea light.
11. Rubblestone; rough cast outside; solid wall, 5 feet; coated with cement; white; circular, in a battering form; stone-lantern gallery.
12. Dr. Faraday's.
13. 68 feet.
14. 113 feet.
15. 11½ miles.
16. 16 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. See Return for St. Peter's (Caskets) Light.
20. See Lighthouses, General Return, 19.
21. See Return for St. Peter's (Caskets) Light.
22. 12 burners.
23. None.
24. See Return for St. Peter's (Caskets) Light.
25. Do. do.
26. None at St. Thomas'. (See Dungeon.)
27. None.
28. 13 days.
29. See Return for St. Peter's (Caskets) Light.
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 5 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 11 feet 6 inches; total, 24 feet 6 inches. 1*rice*; see Return for St. Peter's (Caskets) Light.
32. See Return for St. Peter's (Caskets) Light.
33. Do. do.
34. Do. do.
35. Do. do.
36. Do. do.
37. Do. do.
38. Included in Return for St. Peter's (Caskets) Light.
39. See Lighthouses, General Return, 19.
40. Included in Return for St. Peter's (Caskets) Light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. Included in Return for St. Peter's (Caskets) Light.
44. Do. do.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. See Return for St. Peter's (Caskets) Light.
51. Do. do.
52. No.
53. See Return for St. Peter's (Caskets) Light.
54. Barometer, with thermometer attached; external and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Do. do.
57. See Return for St. Peter's (Caskets) Light.

CORPORATION OF TRINITY HOUSE, LONDON.

43.

DUNGEON (Caskets).

The Highest of the Casket Rocks.

3. T. N. Barbhensen, Alderney.
4. Three, triangular. Dungeon, E. $\frac{3}{4}$ N., 62 yards from St. Peter's; N.E. $\frac{1}{2}$ E., 46 yards from St. Thomas.
5. 7th November 1722. See General Return, 19.
6. See Return for St. Peter's (Caskets) Light.
7. Ditto, ditto.
8. Ditto, ditto.
9. Ditto, ditto.
10. Sea light.
11. See Return for St. Peter's (Caskets) Light.
12. Dr. Faraday's.
13. 45 feet.
14. 113 feet.
15. 11 miles.
16. 16 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. See Return for St. Peter's (Caskets) Light.
20. See Lighthouses, General Return, 19.
21. See Return for St. Peter's (Caskets) Light.
22. 12 hnrners.
23. None.
24. William Wilkins and Co., London.
25. See Return for St. Peter's (Caskets) Light.
26. Bell of 12 cwt. in a stone bell tower about 50 feet from the Dungeon tower, sounded by clockwork machinery.
27. 13 days.
28. 13 days.
29. See Return for St. Peter's (Caskets) Light.
30. Completed.
31. See Return for St. Peter's (Caskets) Light.
32. Not purchased; lease expired 1785.
33. See Return for St. Peter's (Caskets) Light.
34. Ditto, ditto.
35. Ditto, ditto.
36. Ditto, ditto.
37. Ditto, ditto.
38. Included in Return for St. Peter's (Caskets) Light.
39. See Lighthouses, General Return, 19.
40. Included in Return for St. Peter's (Caskets) Light.
41. 545*l.* 3*s.* 6*d.*
42. See Lighthouses, General Return, 19.
43. Included in Return for St. Peter's (Caskets) Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. See Return for St. Peter's (Caskets) Light.
51. Ditto, ditto.
52. No.
53. See Return for St. Peter's (Caskets) Light.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. See Return for St. Peter's (Caskets) Light.

44.

START.

140 yards inside the S.E. extreme of the Point.—The Upper Light.

3. Thomas Edward Ditcham, Alma Place, Plymouth.
4. Two in one tower; upper light 12 feet above the lower.
5. February 1857. See General Return, 19.
6. Rear-Admiral Sir Thomas Masterman Hardy (through the Admiralty). See Lighthouses, General Return, 19.
7. It being the easternmost headland in that part of the Channel.
8. 1st July 1836.
9. Builder, Hugh McLutosh; Engineer, James Walker; Superintendent of the Works, John Abernethy. By contract.
10. Sea light.
11. Granite; solid wall, at base 4 feet 3 inches, at top 2 feet; not coated; white; circular, with castellated parapet.
12. Dr. Faraday's.
13. 92 feet.
14. 204 feet.
15. 15 $\frac{1}{2}$ miles.
16. 20 miles.
17. 255°. N. 15 E., W.
18. Flashing; bright.
19. Perfect revolution in eight minutes, showing a flash every minute.
20. See Lighthouses, General Return, 19.
21. Dioptric. 8 polygonal lenses of 8 to the circle, with 7 tiers of concave mirrors above the lenses; fontain, 4 concentric wick lamp, and regulating condenser; clockwork revolving machine.
22. 1st order.
23. None.
24. Optical parts, Isaac Cookson and Company, Newcastle; frame, lamps, revolving machine, &c., R. Wilkins and Son, London.
25. Faraday's tube, $\frac{4}{5}$ inches diameter over the flame of the lamp, and by air chamber under lantern.
26. None; bell of about 40 cwt. intended to be placed near the lighthouse.
27. None.
28. 79 days.
29. Lighthouse, 4,773*l.* 16*s.* 4*d.*; adjoining buildings, 1,119*l.* 17*s.* 1*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 12 feet 6 inches; total, 24 feet 6 inches. Price 1,117*l.* 5*s.*
32. Not purchased.
33. 9*l.* 1*s.* since construction.
34. 16*l.* 19*s.* 5*d.*; not by contract; once in four years.
35. Two (for both lights); one at 65*l.* and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,217*l.* 7*s.*; 190*l.* 10*s.* 6*d.*; 99*l.* 19*s.* 11*d.*
37. 1857, 19*l.* 16*s.* 1*d.*; 1858, 15*l.* 15*s.* 1*d.*, including lower light.
38. 1857, oil, 479 gallons; wicks, 75 yards. 1858, oil, 498 gallons; wicks, 54 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7 $\frac{1}{2}$ *d.* per yard. 1857, 2*l.* 6*s.* 10 $\frac{1}{2}$ *d.* 1858, 1*l.* 13*s.* 9*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 945*l.* 15*s.* 0 $\frac{1}{2}$ *d.* 1858, 930*l.* 9*s.* 8*d.* Total for 1852, 3,858*l.* 3*s.* 11 $\frac{1}{2}$ *d.*
44. 1852, 225*l.* 15*s.* 1*d.*; 1858, 238*l.* 9*s.* 10*d.*, including lower light.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 19th June (weather prevented a landing); 24th June. 1858, 11th June; 21st October (weather prevented landing). Agent: 1857, 30th March; 19th June; 23rd July; 25th September; 29th October; and 25th December. 1858, 26th June. No other date recorded.
52. No.
53. 1 lamp, 4 burners, 1 refractor, 1 reservoir, and 1 receiver; in the bottom of tower. Diameter of oil cellar, 18 feet; height of ditto, 3 feet 2 inches.
54. Barometer, with thermometer attached; external and internal thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

45.

START, LOWER.

On the Watchroom Floor of the Tower.

3. Thomas Edward Ditcham, Alma Place, Plymouth.
4. Two, in one tower. Lower 12 feet below the upper light.
5. February 1827. See General Return, 19.
6. Rear-admiral Sir Thomas Masterman Hardy (through the Admiralty).
7. That it might lead vessels up to Torbay.
8. 1st July 1836.
9. Builder, Hugh McIntosh. Engineer, James Walker. Superintendent of the Works, John Abernethy. By contract.
10. Sea light.
11. Granite; solid wall, at base 4 feet 3 inches, at top 2 feet; not coated; white; circular, with castellated parapet.
12. Dr. Faraday's.
13. 92 feet.
14. 192 feet.
15. 14½ miles.
16. 15 miles.
17. 15°. N. 60 E. N. 75 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamp, burner ¾ of an inch, and parabolic reflector 21 inches diameter, 9 inches deep.
22. One burner.
23. None.
24. Robert Wilkins and Son, London.
25. None.
26. None.
27. None.
28. 79 days.
29. See Return for Start Upper Light.
30. Completed.
31. Lightroom window, height, 3 feet 3½ inches; breadth, 2 feet. Fitting up lightroom, 34*l.* 5*s.* 6*d.*
32. Not purchased.
33. Included in Return for Upper Light.
34. Ditto, ditto.
35. Two (for both lights); one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 31*l.* 15*s.* 6*d.* Fitting included in Return for Upper Light.
37. Included in Return for Upper Light.
38. 1857, oil, 43 gallons; wicks, 9 dozen. 1858, oil, 43 gallons; wicks, 10 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*s.* 10½*d.* 1858, 2*s.* 1*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Start Upper Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 24th June; 19th June, weather prevented a landing. 1858, 11th June; 21st October, weather prevented a landing. Agent: 1857, 30th March; 19th June; 23rd July; 25th September; 29th October; 25th December. 1858, 26th June. No other date recorded.
52. No.
53. Two lamps, with burners complete. In the cellar at bottom of tower; diameter, 18 feet; height, 8 feet 2 inches.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

46.

PLYMOUTH BREAKWATER.

The West End of the Breakwater.—The Upper Light.

3. Thos. Edward Ditcham, Alma Place, Plymouth.
4. Two, in one tower. Upper 15 feet above the lower light.
5. November 1812. Lighthouse proposed, November 1820, by the Admiralty. See Lighthouses, General Return, 19.
6. The mayor and several merchants of Plymouth (through the Admiralty). See General Return, 19.
7. For leading through the western entrance into Plymouth Sound.
8. 15th July 1813, from a lightvessel. 1st June 1844, from present lighthouse.
9. Builder, not known (built by Admiralty). Engineers, Messrs. Rennie and Whidbey. Superintendent of the Works, William Stewart. Not known as to contract.
10. Sea light.
11. Granite; solid wall, at base 5 feet 6 inches, at top 1 foot 9 inches; not coated or coloured; circular; lantern gallery with gun-metal stanchions.
12. Dr. Faraday's.
13. 76 feet.
14. 63 feet.
15. 8½ miles.
16. 9 miles.
17. 360°. The whole circle.
18. Fixed; red and bright; 298° 7' 30" red; 61° 52' 30" bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric, 4 refractors of 6 to the circle, with 17 zones of prisms, 12 above and 5 below the refractors; fountain, 3-concentric wick lamp, with regulating condenser; red shade outside the lens.
22. 2nd order.
23. August 1845. Red shade fitted by direction of the Board. January 1853. Zones substituted for mirrors.
24. Optical parts, Henry Lepaute, Paris. Frame, lamp, shades, &c., R. Wilkins and Son, London.
25. Faraday's tube, 3½ inches diameter over the flame of the lamp, and ventilators in lantern floor.
26. Bell of 7 cwt., sounded by clockwork machinery.
27. 14 days.
28. 14 days.
29. Not known; built by the Admiralty.
30. Completed.
31. Diameter, 12 feet 6 inches. Height: pedestal, 4 feet 9 inches; glass, 7 feet 6 inches; glass to vane, 10 feet 9 inches; total, 23 feet. Price not known.
32. Not purchased. Management transferred to Trinity House.
33. 2*l.* 5*s.* 9*d.* since construction.
34. 1*l.* 5*s.* 8*d.* (internal and lantern only). Not by contract. Not painted or coated externally.
35. Three (for both lights); one at 36*l.* 10*s.*, one at 45*l.* per annum, and house rent, one 15*l.*, two 10*l.* each, per annum, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Apparatus not known. Zones, 53*l.* 7*s.* Freight, 13*l.* 7*s.* 4*d.*
37. 1857, 16*l.* 10*s.* 10*d.*, for both lights. 1858, 10*l.* 5*s.* 7*d.* ditto.
38. 1857, oil, 195 gallons; wicks, 32 yards. 1858, oil, 207 gallons; wicks, 24 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 6½*d.* per yard. 1857, 17*s.* 4*d.* 1858, 13*s.*
41. 77*l.* 9*s.* 8*d.*
42. See Lighthouses, General Return, 19.
43. No toll.
44. 1852, 246*l.* 13*s.* 3*d.* 1858, 256*l.* 6*s.* 9*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 30th June; 11th July; 14th and 27th October. 1858, 10th September; 1st October. Agent: 1857, 17th January; 22nd February; 26th March; 27th April; 5th, 6th, 11th, 25th, and 29th May; 1st, 11th, 18th, 20th, and 29th June. None recorded in second half year. Agent: 2nd, 5th, 6th, and 22nd January; 13th and 17th February; 5th and 18th March; 8th and 20th April; 4th and 27th May; 10th and 15th June; 7th and 31st July; 4th, 16th, and 20th August; 1st and 13th September; 10th and 21st October; 13th and 27th November; 14th and 22nd December.
52. No.
53. 1 lamp, 3 burners, 2 reservoirs, 2 receivers, 6 red shades; oil stored in a room at the base of the tower. Diameter of oil room, 8 feet 8 inches; height, 7 feet.
54. Barometer, with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, Ditto.
57. Once a month; two of the three keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by sailing tender.

47.

PLYMOUTH BREAKWATER.

The West End of the Breakwater.—The Lower Light.

3. Thomas Edward Ditcham, Alma Place, Plymouth.
4. Two, in one tower. Lower 15 feet below the upper light.
5. November 1858. See General Return, 19.
6. L. C. Baily, R.N.
7. For leading between the Draystone and the Knap.
8. 1st June 1854.
9. See Return for Upper Light.
10. Sea light.
11. See Return for Upper Light.
12. Dr. Faraday's.
13. 76 feet.
14. 48 feet.
15. $7\frac{1}{2}$ miles.
16. 9 miles.
17. 11° . S. 56 W.; S. 67 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. One refractor of three to the circle, and Argand lamp burner $\frac{1}{2}$ of an inch in diameter.
22. 6th order.
23. December 1854. 12-inch parabolic reflector taken away, and lens substituted by direction of the Board.
24. Optical part, Henry Lepaute, Paris. Lamp, Wm. Wilkins London.
25. No special mode.
- 26, 27, 28, 29, 30. See Return for Upper Light.
31. Light-room window, 18 inches by 6 inches.
- 32, 33, 34, 35. See Return for Upper Light.
36. See Return for Upper Light.
37. Included in Return for Upper Light.
38. 1857, oil, 46 gallons; wicks, 8 dozen. 1858, oil, 34 gallons; wicks, 7 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2s. 6d. per gross. 1857, 1s. 8d. 1858, 1s. 5 $\frac{1}{2}$ d.
41. See Return for Upper Light.
42. See Lighthouses, General Return, 19.
43. No toll.
44. See Return for Upper Light.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
48. November 1854, Mr. Thompson, Queen's Harbour-master, Plymouth, that the additional light lately placed for the purpose of marking the Knap and Draystone shows to the west of the Draystone and the east of the Knap.
49. Committee deputed to act immediately. Floating light-reflector in use not marking the limit with sufficient distinctness, a fourth order refractor was substituted.
50. Committees of the Elder Brethren and Agent.
51. Committees : 1857, 30th June; 11th July; 14th, 27th October. 1858, 10th September; 1st October. Agent : 1857, 17th January; 22nd February; 26th March; 27th April; 5th, 6th, 11th, 25th, 29th May; 1st, 11th, 18th, 30th, 29th June. None recorded for second half year. 1858, 2nd, 5th, 6th, 22nd January; 13th, 17th February; 5th, 18th March; 8th, 20th April; 4th, 27th May; 10th, 15th June; 7th, 31st July; 4th, 10th, 20th August; 1st, 13th September; 10th, 21st October; 13th, 27th November; 14th, 22nd December.
52. No.
53. None. In base of the tower.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month. Two of the three keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by sailing tender.

48.

EDDYSTONE.

On the Rock off Plymouth.

3. Thomas Edward Ditcham, Alma Place, Plymouth.
4. One.
5. About 1698.
6. Not stated, except that lighthouse was erected at the request of the navigation. See Lighthouses, General Return, 19.
7. To indicate the position of the rock.
8. 1698 as a coal fire; rebuilt 1734, and 15th November 1759, (present lighthouse); 10th September 1810 as an oil light.
9. Builder and Engineer, John Smeaton. Contract for stone only.
10. Sea light.
11. Granite; entirely solid up to 12 feet from base; solid wall commencing 263 feet from base; two feet six inches, one foot six inches. Not coated. Red and white in alternate horizontal bands. Circular. Lantern gallery with iron railing.
12. Dr. Faraday's.
13. 89 feet.
14. 72 feet.
15. 9 miles.
16. 14 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. Six refractors of six to the circle, with 17 zones of prisms, 12 above and five below the refractors. Fountain, three concentric wick lamp, with regulating condenser.
22. 2nd order.
23. 1845, light altered as above from 24 Argand lamps and parabolic reflectors by direction of the Board. No alteration in character.
24. Optical parts, Henry Lepaute, Paris. Frame, lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, $\frac{3}{4}$ inches diameter over the flame of the lamp.
26. None.
27. None.
28. 16 days.
29. Not known. Constructed by lessees.
30. Completed.
31. Diameter, 10 feet. Height; pedestal, 6 feet 6 inches; glass, 8 feet 9 inches; glass to vane, 12 feet 9 inches; total, 28 feet. 2,818l. 10s. 9d.
32. Not purchased, lease expired.
33. 22l. 17s. 10d. since 1822.
34. 16l. 7s. 3d. Not by contract. Once in four years.
35. Four; one at 60l. and three at 45l. 10s. per annum; 1s. 6d. per diem per man for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. 1,154l. 15s. Fitting included in that of lantern. Transport, 85l. 5s. 7d.
37. 1837, 10l. 13s. 10d. 1858, 10l. 18s. 7d.
38. 1837, oil, 210 gallons; wicks, 26 yards. 1858, oil, 221 gallons; wicks, 18 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 6 $\frac{1}{2}$ d. per yard. 1857, 14s. 1d. 1858, 9s. 9d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter 1852, 1,905l. 9s. Ditto, 1858, 1,844l. 5s. 7d. Total income for 1852, 7,865l. 19s. 2 $\frac{1}{2}$ d.
44. 1852, 412l. 16s. 11d. 1858, 407l. 4s. 9d. See Lighthouses, General Return, 19.
45. August 1858. H. King, Penzance, complaining of charge for Eddystone and Breakwater lights in and out of Plymouth for the same cargo, the vessel not having broken bulk, thinks the lights not due twice for the same voyage. Informed that lights are due each time of passing, unless the second passage be made within the same day of 24 hours, counting from midnight to midnight.
- 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. By Agent. Visited by Committees of the Elder Brethren. (See No. 51.)
51. Committees prevented landing by the weather: 1857, 23rd April; 24th James 10th July; 1858, 23rd March. Inspections by Agent : 1857, 14th, 26th January, 11th June; 2nd, 8th, 19th, 27th July; 24th August; 26th September. 1858, 13th February; 17th April; 12th, 30th May; 12th September.
52. No.
53. One lamp complete; three burners. In upper storeroom (second room over stairs from entrance). Diameter, 12 feet 4 inches; height, 7 feet 11 inches.
54. Barometer, with thermometer attached. External and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month. Three of the four keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by sailing tender.

CORPORATION OF TRINITY HOUSE, LONDON.

49.

FALMOUTH HARBOUR.

Extreme of the low W.S.W. Part of St. Anthony's Point.

3. Thos. Edwd. Ditcham, Alma Place, Plymouth.
4. One.
5. December 1830.
6. Mayor and trade of the Port of Falmouth. See Lighthouses, General Return, 19.
7. To mark the entrance of Falmouth Harbour, and in connection with the Lizard to clear the Manacles.
8. 20th April 1835.
9. Builders, Jacob and Thos. Olver, Falmouth. Engineer, James Walker. By contract.
10. Local.
11. Granite; solid wall, at base 3 feet 6 inches, at top 2 feet 6 inches; not coated; white; octagonal; stone lantern gallery.
12. Dr. Faraday's.
13. 63 feet.
14. 72 feet.
15. 9 miles.
16. 13 miles.
17. 270°. S. 46 E., N. 45 W.
18. Revolving; bright.
19. Perfect revolution in 2 minutes 40 seconds, showing a flash every 20 seconds.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clock-work revolving machine.
22. Eight burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{3}$ inch diameter over the flames of the lamps, and ventilators in the lantern pedestal.
26. None.
27. None.
28. 12 days.
29. Lighthouse, 2,894*l.* 18*s.* 10*d.*; adjoining buildings, 985*l.* 16*s.* 6*d.*; site, including law charges of disputed possession, 662*l.* 16*s.* 8*d.*
30. Completed.
31. Diameter, 12 feet 6 inches. Height: pedestal, 4 feet 6 inches; glass, 7 feet; glass to vane, 13 feet 6 inches; total, 25 feet. 874*l.* 15*s.* 7*d.*
32. Not purchased.
33. 19*l.* 1*s.* 10*d.* since construction.
34. 19*l.* 18*s.* 9*d.*; not by contract; once in four years.
35. Two; one at 65*l.*, one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 467*l.* 2*s.*; 88*l.* 16*s.*; 78*l.* 14*s.* 6*d.*
37. 1857, 4*l.* 8*s.* 9*d.*. 1858, 5*l.* 0*s.* 9*d.*
38. 1857, oil, 839 gallons; wicks, 51 dozen. 1858, oil, 366 gallons; wicks, 34 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 10*s.* 7½*d.*. 1858, 7*s.* 1*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 176*l.* 19*s.* 7½*d.*. Do., 1858, 259*l.* 9*s.* 2*d.*. Total income for 1852, 837*l.* 2*s.* 2½*d.*
44. 1852, 200*l.* 3*s.* 4*d.*. 1858, 200*l.* 12*s.* 1*d.*. See Lighthouses, General Return, 19.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
46. October 1859. Commander Lory, R.N., St. Keverne. "That the Falmouth Harbour Light, being in the bight of the bay, is useless as a guide to vessels going up and down channel, and the weather in general being hazy during the winter months, it cannot be seen by vessels approaching the Manacles. If the Elder Brethren had caused it to be fixed on these rocks instead of St. Anthony's Point, it would have guarded against every danger as well as be a safe guide to Helford and Falmouth."
- These observations were incidental to Commander Lory's proposal for a light on the Manacles, and were not concurred in.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 23rd June. 1858, 11th September. Agent: 1857, 19th February; 27th March; 14th May; 5th August; 27th September. 1858, 25th March; 15th April; 24th June; 22nd November.
52. No.
53. Three lamps, with burners complete. In a room adjoining the tower leading underground and level with the bottom floor. Dimensions of oil cellar: length, 12 feet; breadth, 12 feet 2 inches; height, 9 feet 4 inches.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

50.

LIZARD, EASTERN.

Lizard Cliff or Point.

3. Thomas Edward Ditcham, Alma Place, Plymouth.
4. Two; W. by N. northerly, E. by S. southerly; 74 yards.
5. September 1748.
6. Capt. Richard Farish and trade of the City of London, also Trinity House, Hull, and the northern ports. See Lighthouses, General Return, 19.
7. Being the southernmost headland of that part of the Channel.
8. 22nd August 1752 as a coal fire; 16th January 1812 as an oil light.
9. Not known; built by the lessee, Thomas Fonncreau.
10. Sea light.
11. Brick; solid wall, at base 4 feet, at top 2 feet 9 inches; coated with cement; white; octagonal; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 61 feet.
14. 229 feet.
15. 16½ miles.
16. 21 miles.
17. 235°. E., N. 35 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 19 burners.
23. None.
24. Reflectors and frame, George Robinson, London. Lamps, &c.: R. Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{3}$ inch diameter over the flames of the lamps, and by air tubes round the pedestal of the lantern.
26. None.
27. None.
28. 39 days.
29. Lighthouse not known; alterations, including lanterns and apparatus, 10,277*l.* 8*s.* 6*d.*
30. Completed.
31. Diameter, 13 feet. Height: pedestal, 3 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 11 feet; total, 22 feet. Price included in cost of lighthouse.
32. Not purchased; lease expired.
33. 30*l.* 8*s.* 4*d.* (for both lights) since 1822.
34. 30*l.* 5*s.* (for both lights); not by contract; once in four years.
35. Three (for both lights); one at 75*l.*, one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in cost of lighthouse.
37. 1857, 24*l.* 6*s.*, for both lights. 1858, 21*l.* 15*s.* 8*d.*, ditto.
38. 1857, oil, 765 gallons; wicks, 85 dozen. 1858, oil, 767 gallons; wicks, 87 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 17*s.* 8½*d.*. 1858, 18*s.* 1½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 1,017*l.* 4*s.* 5½*d.*. Midsummer quarter, 1858, 993*l.* 12*s.* 11*d.*. Total for 1852, 4,181*l.* 14*s.* 1½*d.*. (For both lights).
44. 1852, 492*l.* 11*s.* 5*d.*. 1858, 536*l.* 8*s.* 9*d.*. (for both lighthouses.) See Lighthouses, General Return, 19.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 20th June; 11th July. 1858, 14th June; 10th July. Agent: 1857, 2nd January; 20th February; 27th March; 26th June; 30th July; 27th September; 10th and 29th December. 1858, 11th and 26th March; 17th April; 25th June; 28th September; 23rd November; 30th December.
52. No.
53. Eight lamps, with burners complete; in the bottom of the tower. Height of oil room, 8 feet 4 inches; diameter of ditto, 9 feet 6½ inches.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

51.

LIZARD, WESTERN.

Lizard Cliff or Point.

3. Thomas Edward Ditcham, Alma Place, Plymouth.
4. Two; W. by N. northerly, E. by S. southerly; 74 yards.
5. September 1748.
6. Captain Richard Farish and trade of the City of London, also Trinity House, Hull, and the northern ports. See Lighthouses, General Return, 19.
7. Being the southernmost headland of that part of the Channel.
8. 22nd August 1752 as a coal fire. 16th January 1812 as an oil light.
9. Not known. Built by lessee (Thomas Fomercuau).
10. Sea light.
11. Brick; solid wall, at base 4 feet, at top 2 feet 9 inches; coated with cement; white; octagonal; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 61 feet.
14. 232 feet.
15. 16½ miles.
16. 21 miles.
17. 232°. S. 87 E., N. 35 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 19 burners.
23. None.
24. Reflectors and frame, George Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by air tubes round the pedestal of the lantern.
26. None.
27. None.
28. 39 days.
29. See Return for Lizard Eastern Light.
31. Diameter, 13 feet. Height: pedestal, 3 feet 6 inches; glass, 8 feet; glass to vane, 11 feet; total, 22 feet 6 inches. Price, see Return for Lizard Eastern Light.
32. Not purchased; lease expired.
33. See Return for Lizard Eastern Light.
34. Ditto, ditto.
35. Three (for both lights); one at 75*l.*, one at 65*l.*, and one 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. See Return for Lizard Eastern Light.
37. Ditto, ditto.
38. 1857, oil, 765 gallons; wicks, 84 dozen. 1858, oil, 769 gallons; wicks, 88 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 17*s.* 6*d.* 1858, 18*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Lizard Eastern Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 20th June; 11th July. 1858, 14th June; 16th July. Agent: 1857, 2nd January; 20th February; 27th March; 26th June; 30th July; 27th September; 10th and 20th December. 1858, 11th and 26th March; 17th April; 26th June; 28th September; 23rd November; 30th December.
52. No.
53. Light lamps, with burners complete; in the bottom of the tower. Diameter of oil room, 9 feet 6½ inches; height, 8 feet 4 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

52.

LONGSHIPS.

The largest and highest of the Rocks

3. John N. Tremearne, St. Ives, Cornwall.
4. One.
5. October 1790.
6. The foreign and coasting trades using the British and St. George's Channels. See Lighthouses, General Return, 19.
7. To mark the westernmost rocks off the Land's End.
8. 29th September 1795.
9. Builder not known, built by private proprietor. Engineer, Samuel Wyatt. Whether by contract or otherwise not known.
10. Sea light.
11. Granite; solid wall, at base 4 feet, at top 3 feet; not coated; white; circular; lantern gallery with iron railing and flag-staff.
12. Dr. Faraday's.
13. 52 feet.
14. 79 feet.
15. 9½ miles.
16. 14 miles.
17. 259°. S. 34 E., N. 45 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 19 burners.
23. None.
24. Reflectors and frame, George Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by openings in lantern pedestal.
26. None.
27. None.
28. 10 days.
29. Not known.
30. Completed.
31. Diameter, 12 feet 6 inches. Height: pedestal, 3 feet 9 inches; glass, 7 feet 3 inches; glass to vane, 11 feet; total, 22 feet. Lantern not known. Ventilating apparatus, 59*l.* 19*s.* 6*d.*
32. 37,47*l.* 9*s.* 2*d.*, 26th March 1836.
33. 36*l.* 8*s.* 7*d.* since purchase.
34. 21*l.* 19*s.* 9*d.*; not by contract; once in four years.
35. Four; one at 60*l.*, three at 40*l.* 10*s.* each, and 1*s.* 6*d.* per diem per man for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Not known.
37. 1857, 47*l.* 9*s.* 9*d.* 1858, 36*l.* 11*s.* 2*d.*
38. 1857, oil, 744 gallons; wicks, 133 dozen. 1858, oil, 766 gallons; wicks, 132 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 11*l.* 7*s.* 8½*d.* 1858, 11*l.* 7*s.* 6*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1858, quarter, 3,036*l.* 12*s.* 3¼*d.* 1858, quarter, 2,975*l.* 6*s.* 11*d.* Total for 1852, 12,638*l.* 17*s.* 8¼*d.*
44. 1859, 566*l.* 1*s.* 6*d.* 1858, 536*l.* 4*s.* 8*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 7th May, 24th April, 20th June, 13th July; weather prevented a landing. 1858, 22nd March; 11th June, 14th June, 11th and 13th September, 16th October, weather prevented a landing. Agent: 1857, 16th October. 1858, 23rd January; 6th May.
52. 7th October 1857, seven of the 19 lamps extinguished by the sea penetrating between the lower part of the cow and the "petticoat;" duration, one hour.
53. 6 lamps, with burners complete; oil is stored in the living room (in tower). Diameter, 14 feet; height, 8 feet.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month. 3 of the 4 keepers are constantly at the light-house, and one on shore in rotation. Relieved by hired sailing boat.

CORPORATION OF TRINITY HOUSE, LONDON.

53.

ST. AGNES.

Scilly.

3. Hugh Tregarthen, Tresco, Scilly.
4. One.
5. 1679.
6. Sir John Clayton; also by the East India Company and trade of London and ports generally. See Lighthouses, General Return, 19.
7. To mark the locality of the Scilly Islands.
8. 30th October 1630 as a local fire (stationary). 1790 as an oil light (revolving).
9. Built under superintendance of Captains Hugh Till and Simon Bayly, Elder Brethren. Not by contract.
10. Sea light.
11. Stone; solid wall, at base 6 feet 6 inches, at top 8 feet 8 inches; circular; not coated, white; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 74 feet.
14. 138 feet.
15. 12½ miles.
16. 18 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. Perfect revolution in three minutes, showing a face every minute.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clockwork revolving machine.
22. 30 burners.
23. None.
24. Reflectors, George Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 1½ inch diameter over the flames of the lamps, and by windows opened from the first floor of the tower.
26. None.
27. None.
28. 26 days.
29. Lighthouse, not known; dwellings, 89*l.* 12*s.* 5*d.*; site for dwellings, 17*l.* 18*s.*
30. Completed.
31. Diameter, 14 feet 6 inches. Height: pedestal, 2 feet 7 inches; glass, 3 feet; glass to vane, 12 feet; total, 22 feet 7 inches. Price not known.
32. Not purchased.
33. 87*l.* 19*s.* 5*d.* since 1822.
34. 23*l.* 18*s.* 8*d.*; not by contract; once in four years.
35. Two; one at 65*l.*, and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known.
37. 1857, 15*l.* 1*s.* 8*d.* 1858, 16*l.* 11*s.* 3*d.*
38. 1857, oil, 960 gallons; wicks, 95 dozen. 1858, oil, 984 gallons; wicks, 112 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 19*s.* 9½*d.* 1858, 1*l.* 3*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, quarter, 1,516*l.* 1*s.* 2½*d.* 1858, quarter, 1,522*l.* 9*s.* 7*d.* Total for 1852, 6,377*l.* 17*s.* 2½*d.*
44. 1852, 350*l.* 9*s.* 1*d.* 1858, 342*l.* 0*s.* 8*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 22nd June; 11th July; 17th October. 1858, 12th June; 14th September; 16th October. Agent: 1857, 4th, 17th, 23th February; 31st March; 2nd May; 2nd, 5th, 26th June; 28th July; 31st August; 1st, 31st October; 4th December. 1858, 5th, 29th January; 20th February; 26th March; 19th April; 25th May; 12th, 21st June; 22nd July; 31st August; 18th September; 13th October; 2nd November; 1st December.
52. No.
53. Seven lamps, with burners complete; two reflectors; revolving machine; on the ground floor of the tower. Diameter of oil room, 15 feet 9 inches; height, 11 feet 5 inches.
54. Barometer, with thermometer attached; internal and external thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

54.

BISHOP ROCK.

Scilly, the South-westernmost of the Group.

3. Hugh Tregarthen, Tresco, Scilly.
4. One.
5. No application; proposed by Inspecting Committees of the Elder Brethren.
6. See Lighthouses, General Return, 19.
7. To mark the westernmost rocks of the Scilly Islands.
8. 1st September 1858.
9. Engineer, James Walker. Superintendent of the Works, N. Douglass. Contract for stone only, Messrs. Freeman.
10. Sea light.
11. Granite tower, entirely solid to 45 feet above high water; solid wall, at base 4 feet 9 inches, at top 2 feet; not coated or coloured; circular in a battering form; lantern gallery with iron railings and flagstaff.
12. Dr. Faraday's.
13. 147 feet.
14. 110 feet.
15. 11½ miles.
16. 16 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 8 reflectors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. None.
24. Optical parts, Henry Lépaute, Paris. Frame, lamps, &c., W. Wilkins and Co., London.
25. Faraday's tube, 4½ inches diameter over the frame of the lamp, and by openings in the lantern pedestal.
- 26, 27. None.
28. 10 days in the four months, September, October, November, December.
29. 36,559*l.* 18*s.* 9*d.* for Tower on Rock and dwellings on mainland.
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 5 feet; glass, 10 feet 3 inches; glass to vane, 12 feet 9 inches; total, 28 feet, 1,452*l.*
32. Not purchased.
- 33, 34. Not exhibited until 1st September 1858.
35. Four; one at 5*l.* per annum, and three at 4*l.* 10*s.* each per annum, 1*s.* 6*d.* per diem for victualling, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,313*l.* 10*s.* Delivered at the works. Fitting included in cost of lighthouse, &c.
37. Not exhibited until 1st September 1858.
38. 1857, nil. 1858, oil, 190 gallons, wicks, 12 yards, during the 4 months ending 31st December.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, nil. 1858, 7*s.* 6*d.* (for 4 months).
41. 24*l.* 15*s.*
42. See Lighthouses, General Return, 19.
43. Not established till after Midsummer 1858. Toll not collected till 1859.
44. Nil in 1852.
45. The Elder Brethren were of opinion that there should not be any toll for this light, in consideration of its having been commenced before the passing of the Merchant Shipping Act, 1854, and of the trade not having invited its erection nor pledged themselves to contribute; the work having been regarded as an adjunct to the Scilly Light, the tolls for which are sufficient to maintain both. The Board of Trade considered principle now acted on to be that a toll should be imposed for every new lighthouse, and that if the aggregate sum collected for light dues amounts to more than is required for the erection and maintenance of lighthouses generally, the surplus should be dealt with by reducing the tolls generally, rather than by making any special exemption in the case of any particular light. An Order in Council was accordingly prepared by their Lordships, and transmitted to the Trinity House, upon receipt of which the Elder Brethren stated that they could not fail to mark with regret that the amount of the toll proposed by their Lordships to be levied in this case should entail so heavy a charge upon ships passing the light to or from British ports.
- 46, 47. Nil. See Lighthouses, General Return, 19.
- 48, 49. Nil.
50. Committees of the Elder Brethren; Agent in 1858.
51. Committees: 1857, 22nd June, 10th July, weather prevented a landing. 1858, 12th June; 12th, 13th September. Agent: 1858, 28th September; 16th, 17th October; 7th November, 7th, 9th, 14th, 28th, 30th December, weather prevented a landing.
52. No.
53. Five lamps; 5 burners, 1 reservoir; 1 receiver. Oil stored on the first floor of the lighthouse. Diameter of oil cellar, 12 feet 6 inches; height, 8 feet 11 inches.
54. Barometer, with thermometer attached; external and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month. 3 of the 4 keepers are constantly at the lighthouse and one on shore in rotation. Relieved by sailing tender, with the assistance, when necessary, of a hired boat's crew.

CORPORATION OF TRINITY HOUSE, LONDON.

55.

GODREY.

Godrey Island, St. Ives Bay.

3. John N. Tremearne, St. Ives, Cornwall.
4. One.
5. December 1854.
6. Chamber of Commerce, Waterford, and trade of the following ports: Penzance, Hayle, St. Ives, St. Agnes, Barnstaple, St. Mawes, Cardiff, Truro, and Falmouth. See Lighthouses, General Return, 19.
7. Because the expense of building on the stones was objected to.
8. 20th March 1858, from a temporary lightvessel. 1st March 1859, from lighthouse.
9. Builders, Thomas Eva, and Thomas Williams, Helstone. Engineer, James Walker. Superintendent of the Works, James Sutcliff. By contract.
10. Sea light.
11. Rubble stone bedded in mortar; solid wall, at base 3 feet 10 inches, at top 2 feet 10 inches; granite at gallery course coated with cement, stone colour; octagonal in a battering form; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 86 feet.
14. 120 feet.
15. 11½ miles.
16. 16 miles.
17. 360°. The whole circle.
18. Flashing; bright.
19. Perfect revolution in 4 minutes, showing a flash every 10 seconds.
20. See Lighthouses, General Return, 19.
21. Dioptric. 24 polygonal lenses of 24 to the circle, with 7 zones of prisms, 13 above and 6 below the lenses; fountain, 4 concentric wick lamp, with regulating condenser. Clockwork revolving machine.
22. 1st order.
23. None.
24. Optical parts, Henry Lépante, Paris. Frame, lamps, revolving machine, &c., W. Wilkins and Co., London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp.
26. Bell of 3 cwt. sounded by clockwork machinery.
27. Bell not in use till 1859. Gong on board lightvessel 21 days.
28. 23 days.
29. 7,082l. 15s. 7d.
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 7 feet; glass, 10 feet; glass to vane, 8 feet; total, 25 feet. Price 1,358l. 11s. 10d.
32. Not purchased.
33. No average yet obtained.
34. Ditto, ditto.
35. Three; one at 60l., and two at 49l. 10s. each per annum, 1s. 6d. per day per man for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. 2,227l. 17s. 6d. (Purchased in 1852 for the Bishop Rock.) Cost of alteration and fitting to this station, 339l. 6s. 10d.
37. Not exhibited in those years.
38. Ditto, ditto.
39. See Lighthouses, General Return, 19.
40. Not exhibited in those years.
41. 244l. 15s. 6d.
42. See Lighthouses, General Return, 19.
43. Toll not collected until 1859.
44. Not exhibited until 1859.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Light not established in 1857. Committees of Elder Brethren and Agent, 1858.
51. Committees: 1858, 20th March; 11th June; 13th September; 21st October, weather prevented a landing. Agent: 14th December.
52. No.
53. Three lamps, one reservoir, one receiver. In the basement of the tower. Diameter of oil cellar, 15 feet; height, 10 feet 1 inch.
54. Barometer, with thermometer attached; external and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month. Two of the three keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by hired sailing boat.

56.

TREVOSE HEAD, HIGH.

On the N.W. Part of the Head, about 2½ miles from Padstow.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two; lower 50 feet in advance or to seaward of the upper, approached by a covered way from the tower, and on a level with its base.
5. August 1809; renewed, February 1813 and December 1832.
6. 1809, Capt. E. P. Penrose, through the Admiralty. 1813, trade of ports in Cornwall, &c. (per the Members of Parliament for the county). 1832, trade of Padstow, per James Mason (collector of Customs). See Lighthouses, General Return, 19.
7. As the most projecting headland on that part of the coast.
8. 1st December 1847.
9. Builders, Jacob and Thomas Oliver, Falmouth. Engineer, James Walker. Superintendent of the Works, H. V. Norris. By contract.
10. Sea light.
11. Stone; inner and outer walls, but solid under 1st floor at top of oil cellar; wall, 4 feet 6 inches; at base, outer wall 4 feet 2½ inches, vacuity 2 inches, inner wall 4½ inches; total, 4 feet 9 inches; at top, outer wall 2 feet 8½ inches, vacuity 2 inches, inner wall 4½ inches; total, 3 feet 3 inches. Not coated; white; circular; stone lantern gallery, no railing; terrace at foot of tower at seaward, with crenelated parapet.
12. Dr. Faraday's.
13. 87 feet.
14. 204 feet.
15. 15½ miles.
16. 20 miles.
17. 274°. S. 86 E., south.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 6 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. None.
24. Optical parts, Henry Lépante, Paris. Frame, lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and ventilators in lantern pedestal.
26. None.
27. None.
28. 25 days.
29. Two light towers and adjoining buildings, 7,351l. 4s. 5d.
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 10 feet; glass to vane, 13 feet 6 inches; total, 24 feet. Lantern and lighting apparatus in one contract, fitted complete, 2,600l. 14s. 9d.
32. Not purchased.
33. 32l. 9s. 6d. since construction, including Low Light.
34. 31l. 13s., including Low Light. Not by contract. Once in four years.
35. Two for both lights; one at 65l. and one at 45l. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in cost of lantern.
37. 1857, 78l. 4s. 3d. 1858, 27l. 10s. 6d.
38. 1857, oil, 805 gallons; wicks, 124 yards, for both lights. 1858, oil, 876 gallons; wicks, 91 yards, ditto.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½d. per yard. 1857, 3l. 17s. 6d. for both lights. 1858, 2l. 16s. 10½d. ditto.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 827l. 6s. 1½d. 1858, 700l. 18s. 3d. Total for 1852, 3,193l. 2s. 7½d.
44. 1852, 214l. 10s. 1d. 1858, 841l. 3s. 5d. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 14th February; 13th July. 1858, 12th, 19th June. Agent: 1857, 23rd November. 1858, 13th April; 8th December.
52. No.
53. 3 lamps, 3 burners, 2 reservoirs. In the basement of the tower. Diameter of oil cellar, 14 feet; height, 9 feet 6 inches.
54. Barometer, with thermometer attached; external and internal thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, di.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

57.

TREVOSE HEAD, LOW

The N.W. Part of the Head, about 2½ miles from Padstow.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two, lower 50 feet in advance or to seaward of the upper light, approached by a covered way from the tower, and on a level with its base.
5. August 1509; renewed, February 1813 and December 1832.
6. 1809, Captain E. P. Penrose (through the Admiralty). 1813, trade of ports in Cornwall, &c. (per the Members of Parliament for the county). 1832, trade of Padstow (per James Mason, collector of Customs). See Lighthouses, General Return, 19.
7. To give distinguishing character.
8. 1st December 1847.
9. Builders, Jacob and Thomas Oliver, Falmouth. Engineer, James Walker. Superintendent of the Works, Henry Norris. By contract.
10. Sea light.
11. Stone; inner and outer walls, but solid under first floor at top of oil cellar, 4 feet 6 inches; at base, outer wall 4 feet 2½ inches, vacuity 2 inches, inner wall 4½ inches; total, 4 feet 9 inches; at top, outer wall 2 feet 8½ inches, vacuity 2 inches, inner wall 4½ inches; total, 3 feet 3 inches. Not coated; white; circular; stone lantern gallery, no railing; terrace at foot of tower to seaward with turreted parapet.
12. Dr. Faraday's.
13. 87 feet.
14. 129 feet.
15. 12 miles.
16. 17 miles.
17. 176°. N. 49 E., S. 53 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 4 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. None.
24. Optical portion, Henry Lépaute, Paris. Frame, lamps, &c., P. Wilkins and Sons, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and ventilators in pedestal and floor of the lantern.
26. None.
27. None.
28. 25 days.
29. See Return for Trevoze High Light.
30. Completed.
31. Diameter, 14 feet. Height; pedestal, 5 feet; glass, 10 feet; glass to vane, 13 feet; total, 28 feet. Lantern and lighting apparatus in one contract, 1,994*l.* 12*s.* 5*d.*
32. Not purchased.
33. See Return for Trevoze High Light.
34. Ditto, ditto.
35. Two (for both lights); one at 6*5l.* and one at 4*5l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in cost of lantern.
37. See Return for Trevoze High Light.
38. 1857, oil, 805 gallons; wicks, 124 yards, for both lights. 1858, oil, 876 gallons; wicks, 91 yards, ditto.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7*1d.* per yard. 1857, 3*l.* 17*s.* 6*d.*, for both lights. 1858, 2*l.* 16*s.* 10*1d.*, ditto.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Lighthouses, General Return, 19.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 26th June, 15th September, 26th October; 24th April, weather prevented a landing. 1858, 12th June. Agent: 1857, 29th May. 1858, 17th February, 27th April.
52. No.
53. Three lamps, with burners complete; one reservoir; one receiver; oil stored in a vault below ground floor of tower. Diameter of oil store, 17 feet 7½ inches; height, 7 feet 5½ inches.
54. Barometer, with thermometer attached; internal thermometer and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

58.

LUNDY, HIGH.

Chapel Hill, Lundy Island.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two in one tower; the upper 70 feet above the lower light.
5. March 1803; renewed, December 1818.
6. 1803, Thos. Hogz and trade of Bideford (per Sir Vere Hunt), 1818, trade of Liverpool, London, Bideford, Cardiff, and Newport. (See Lighthouses, General Return, 19.)
7. The most eligible for the purposes of navigation on entering the Bristol Channel.
8. 21st February 1820. 1st November 1842 as a dioptric light.
9. Builder, Joseph Nelson. Engineer, Daniel Alexander. Superintendent of the Works, James Turnbull. By contract.
10. Sea light.
11. Granite; inner and outer wall; at base, 3 feet 6 inches, vacuity 3 inches, at top 2 feet; not coated; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 96 feet.
14. 540 feet.
15. 24½ miles.
16. 32 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. Perfect revolution in 16 minutes, showing a flash every 2 minutes.
20. See Lighthouses, General Return, 19.
21. Dioptric. 8 refractors or polygonal lenses of 8 to the circle, with 24 zones of prisms, 18 above and 6 below the lenses, fountain, 4 concentric wick lamp, with regulating condenser. Clockwork revolving machine.
22. 1st order.
23. 1857, present apparatus substituted for dioptric apparatus, with mirrors, by direction of the Board. No alteration in "character."
24. R. L. Chance, Brothers, and Company, Birmingham.
25. Faraday's tube, 4½ inches in diameter over the flame of the lamp.
26. None.
27. None.
28. 76 days.
29. Two light towers, 9,781*l.* 17*s.* 11*d.* Adjoining buildings, 395*l.* 2*s.*
30. Completed.
31. Diameter, 14 feet. Height; pedestal, 4 feet 6 inches; glass, 10 feet; glass to vane, 15 feet 6 inches; total, 28 feet. Lantern and fitting in 1843 (including fitting a new apparatus), 1,902*l.* 18*s.* 4*d.*
32. Not purchased.
33. 7*1l.* 12*s.* 6*d.* since 1822, including Lundy Low Light.
34. 19*l.* 14*s.*; not by contract; once in 4 years (including Lundy Low Light).
35. Two (for both lights); one at 6*5l.* and one at 4*6l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Apparatus completely fitted, 1,495*l.*
37. 1857, 3*1l.* 11*s.* 2*d.*, including Lundy Low Light. 1858, 2*5l.* 19*s.* 4*d.*, ditto.
38. 1857, oil, 421 gallons; wicks, 63 yards. 1858, oil, 435 gallons; wicks, 33 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7*1d.* per yard. 1857, 1*l.* 19*s.* 4*1d.* 1858, 1*l.* 0*s.* 7*1d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 495*l.* 12*s.* 6*1d.* Ditto, 1858, 424*l.* 19*s.* 7*d.* Total for 1852, 1,790*l.* 12*s.* 3*d.*
44. 1852, 362*l.* 1*s.* 5*d.*; 1858, 301*l.* 13*s.* 9*d.* (including Low Light). See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
- 48, 49. April 1858, Mr. Heaven, Lundy, that light is not of the slightest use to vessels when most in want of it, in thick and blowing weather, but also in many dark nights, because when the island itself is free from it, the lighthouse stands so high that it is capped by fog. Suggests low lighthouses on north and south extremities of island, one with bell, the other with gong or cannon.
- The question of additional marking for the Lundy in foggy weather is still under consideration. The Elder Brethren propose to place a gun on the west side of the island.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 26th June, 15th September, 26th October; 24th April, weather prevented a landing. 1858, 12th June. Agent: 1857, 29th May. 1858, 17th February, 27th April.
52. No.
53. Three lamps, with burners complete; one reservoir; one receiver; oil stored in a vault below ground floor of tower. Diameter of oil store, 17 feet 7½ inches; height, 7 feet 5½ inches.
54. Barometer, with thermometer attached; internal thermometer and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

59.

LUNDY, LOW.

Chapel Hill, Lundy Island.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two in one tower. Lower 70 feet below the upper light.
5. March 1803; renewed, December 1818.
6. 1803, Thomas Hogg and trade of Bideford (per Sir Vere Hunt). 1818, trade of Liverpool, London, Bideford, Cardiff, and Newport. (See Lighthouses, General Return, 19.)
7. To clear the rocks in the vicinity.
8. 21st February 1890.
9. Builder, Joseph Nelson. Engineer, Daniel Alexander. Superintendent of the Works, James Turnbull. By contract.
10. Sea light.
11. Granite; inner and outer wall, at base 3 feet 6 inches, at top 2 feet, vacuity 3 inches; not coated; white; circular; gallery with iron railing outside lightroom window.
12. Dr. Faraday's.
13. 96 feet.
14. 470 feet.
15. 23 miles.
16. 25 miles.
17. 96°. N. 22½ W., W. 22½ S.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners 1 of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep (in two tiers arranged concavely against the wall of the tower).
22. Nine burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, 1½ inches diameter over the flames of the lamps.
26. None.
27. None.
28. 76 days.
29. See Return for Lundy High Light.
30. Completed.
31. Dimensions of lightroom: length, 11 feet 6 inches; width, 6 feet 6 inches; height in glass, 4 feet 5 inches. (Altered from old lantern built 1829. Cost, with that for High Light and towers, £2,049*l.* 18*s.*)
32. Not purchased.
33. See Return for Lundy High Light.
34. Ditto, ditto.
35. Two (for both lights); one at 6*l.* and one at 4*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 93*l.* 16*s.* 5*d.* in 1842; not entirely new. Fitting included in that of lantern, High Light. Transport, 4*l.* 13*s.* 3*d.*
37. See Return for Lundy High Light.
38. 1857, oil, 287 gallons; wicks, 58 dozen. 1858, oil, 332 gallons; wicks, 45 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 12*s.* 1*d.* per gross. 1858, 9*s.* 4¼*d.* per gross.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Lundy High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
- 48, 49. See Return for High Light.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 26th June; 15th September; 26th October; 24th April, weather prevented a landing. 1858, 12th June. Agent: 1857, 29th May. 1858, 17th February; 27th April.
52. No.
53. Two lamps, with burners complete. In oil store of High Light. Diameter of oil store, 17 feet 7¼ inches; height, 7 feet 5½ inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

60.

BIDEFORD, HIGH.

Braunton Burrows, North Side of the River.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two. N.W. ¼ N., S.E. ¼ S. 311 yards.
5. January 1819.
6. Trade of the Port of Bideford and its vicinity. See Lighthouses, General Return, 19.
7. To lead vessels over the Bideford bar.
8. 10th November 1820.
9. Builder, Engineer, and Superintendent of the Works, Jos. Nelson. Not by contract.
10. Local.
11. Wood; foundation of concrete, and brickwork framing of red fir; oak head and sills; four struts about 12 inches square; exterior, oak shingles; roof covered with copper. White; octagonal.
12. Dr. Faraday's.
13. 87 feet.
14. 36 feet.
15. 10 miles.
16. 14 miles.
17. 15°. N. 23 W.; N. 38 W.
18. Fixed; bright.
19. Not revolving.
20. Between sunset and sunrise, from half flood to half ebb. Number of hours shown, 1857, 1,984; ditto, 1858, 1,955.
21. Catoptric. Argand lamp, burner 1 of an inch, and parabolic reflector 21 inches diameter, 9 inches deep.
22. One burner.
23. None.
24. Reflector, Robinson and Wilkins, London. Lamp, &c., R. Wilkins and Son, London.
25. Faraday's tube, 1½ inches diameter over the flame of the lamp and trapdoor in ceiling of lightroom.
26. None.
27. None.
28. 40 days.
29. Two light towers, including lightroom and apparatus, 4,531*l.* 2*s.* 10*d.*
30. Completed.
31. Lightroom, 11 feet 2 inches by 9 feet; height, 8 feet. Light room window, 2 feet 11 inches by 2 feet 2 inches.
32. Not purchased.
33. 54*l.* 14*s.* 6*d.* since 1822, including Low Light.
34. 17*l.* 15*s.* 4*d.*, including Low Light. Not by contract.
35. Two (for both lights); one at 6*l.* and one at 4*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in cost of tower.
37. 1857, 1*l.* 7*s.* 8*d.*, including Low Light. 1858, 1*l.* 17*s.* 11*d.*, ditto.
38. 1857, oil, 48 gallons; wicks, 9 dozen, for both lights, 1858, oil, 46 gallons; wicks, 9 dozen, ditto.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*s.* 10½*d.* 1858, 1*s.* 10½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 8*l.* 12*s.* 3¼*d.* 1858, 42*l.* 14*s.* Total for 1852, 207*l.* 8*s.* 10*d.*
44. 1852, 163*l.* 1*s.* 3*d.*, including Low Light. 1858, 164*l.* 5*s.* 5*d.*, ditto. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 15th July. 1858, 19th June; 6th August. Agent: 1857, 25th November. 1858, 12th April; 21st May; 11th December.
52. No.
53. Two lamps, with burners complete. On the ground floor of the tower. Diameter of oil store, 17 feet 6 inches; height, 20 feet 6 inches.
54. Barometer, with thermometer attached; external thermometer and compass.
55. See Lighthouses, General Return, 19, and Return for Bideford Low Light.
56. See Lighthouses, General Return, 19.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

61.

BIDEFORD, LOW.

Braunton Burrows, North Side of the River.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two. N.W. $\frac{1}{4}$ N.; S.E. $\frac{1}{4}$ S. 311 yards.
5. January 1819.
6. Trade of the Port of Bideford and its vicinity. See Lighthouses, General Return, 19.
7. To lead vessels over the Bideford Bar.
8. 10th November 1820. 10th May 1832, from present building.
9. Builder, Engineer, and Superintendent of the Works, Joseph Nelson. Not by contract.
10. Local.
11. Wood (a moveable room), on skids placed upon piles; framing below first floor oak, above ditto, red fir. Dimensions of exterior, 11 feet 4 inches by 9 feet 3 inches; interior, 10 feet by 7 feet 11 inches. White; weather-boarded outside; inside lined with copper; four sided.
12. No conductor; building insured.
13. 15 feet.
14. 44 feet.
15. 7 miles.
16. 11 miles.
17. 15°. N. 23 W.; N. 38 W.
18. Fixed; bright.
19. Not revolving.
20. From half flood to half ebb between sunset and sunrise. Number of hours shown, 1857, 1,981; ditto, 1858, 1,955.
21. Catoptric. Argand lamp, burner $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. One burner.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tube, 1 $\frac{1}{2}$ in. diameter over the flame of the lamp, and ventilators in floor and trapdoor in ceiling of lightroom.
26. None.
27. None.
28. 40 days.
29. Lighthouse rebuilt in 1832, 377*l.* 3*s.* 5*d.*
30. Completed.
31. Dimensions of lightroom, 9 feet 3 inches by 7 feet 11 inches; 7 feet high. Window, 2 feet 11 inches by 2 feet 2 inches.
32. Not purchased.
33. See Return for Bideford High Light.
34. Ditto, ditto.
35. Two (for both lights); one at 65*l.* and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. See Return for Bideford High Light.
37. Ditto, ditto.
38. Included in consumption of High Light.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross; cost included with High Light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Bideford High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 15th July. 1858, 19th June; 6th August. Agent: 1857, 25th November. 1858, 12th April; 21st May; 11th December.
52. No.
53. One lamp, with burner complete. In the oil cellar of the High Lighthouse. Diameter, 17 feet 6 inches; height, 20 feet 6 inches.
54. None.
55. A ball 8 feet in diameter, coloured red, is hoisted by day at half-flood, and lowered at half-ebb. In the night time the light is exhibited at half-flood, and extinguished at half-ebb.
56. See Lighthouses, General Return, 19.
57. Not relieved.

62.

BURNHAM, HIGH.

East Side of the Entrance to the River Parrett.

3. William Jones, Bridgwater, Somerset.
4. Two. E. by S. $\frac{1}{4}$ S.; W. by N. $\frac{1}{4}$ N. 500 yards.
5. August 1813, for the light (which had been for some years exhibited at Burnham) to be continued. Renewed 1829 (for two lights).
6. Masters and owners of vessels belonging to Bridgwater, or trading thereto, and parts adjacent. Renewed by trade of Bridgwater and Society of Merchant Venturers of Bristol. See Lighthouses, General Return, 19.
7. For leading to the entrance of the river Parrett.
8. Some years before 1813. Exact date not known. 1st December 1832, from present tower.
9. Builder, Engineer, and Superintendent of the Works, Joseph Nelson. Not by contract.
10. Local.
11. Brick; solid wall, at base 3 feet 6 inches, at top 2 feet; coated with mastic; white; circular; open lantern gallery with iron railing.
12. Dr. Faraday's.
13. 99 feet.
14. 91 feet.
15. 104 miles.
16. 15 miles.
17. 62°. N. 17. W.; N. 79 W.
18. Intermittent; bright.
19. Lamps and reflectors are stationary. Light is visible 3 $\frac{1}{2}$ minutes; obscured $\frac{1}{2}$ minute.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Shutter of lightroom window is moved up and down by clockwork machinery.
22. Four burners.
23. None.
24. Reflectors, &c., Robinson and Wilkins, London. Lamps, R. Wilkins and Son, London.
25. Faraday's tube, 1 $\frac{1}{2}$ in. diameter over the flames of the lamps, and by openings round the lightroom.
26. None.
27. None.
28. 52 days.
29. Lighthouse, &c., and lightroom, 2,702*l.* 7*s.* 5*d.*
30. Completed.
31. Diameter of lightroom, 10 feet 6 inches; do. of window, 6 feet 6 inches. Height: floor to glass, 4 feet; height in glass, 4 feet 6 inches; glass to vane, 11 feet 6 inches; total, 20 feet. Price of ventilating apparatus, including fitting, 106*l.* 9*s.* 9*d.*
32. One lighthouse purchased for 13,681*l.* 17*s.* 3*d.*, August, 1829.
33. 18*l.* 14*s.* 3*d.* since construction, including Low Light.
34. 13*l.* 13*s.* 4*d.*, including Low Light; not by contract; once in four years.
35. Three (for both lights); one at 65*l.* and two at 45*l.* per annum each, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Price 1897*l.* 1*s.* 4*d.* Fittings, including Low Light, 87*l.* 8*s.* Transport, ditto, 3*l.* 15*s.*
37. 1857, 1*l.* 19*s.* 9*d.*, including Low Light; 1858, 4*l.* 11*s.* 4*d.*, ditto.
38. 1857, oil, 155 gallons; wicks, 22 dozen. 1858, oil, 155 gallons; wicks, 21 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 4*s.* 7*d.*; 1858, 4*s.* 4 $\frac{1}{2}$ *d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 163*l.* 2*s.* 1858, 144*l.* 17*s.* 7*d.* Total for 1852, 631*l.* 2*s.*
44. 1852, 266*l.* 10*s.* 7*d.*, including Low Light; 1858, 255*l.* 11*s.* 1*d.*, ditto. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 16th July, weather prevented a landing; 17th July. 1858, 18th June. Agent: 1857, 31st January; 19th February; 20th March; 20th April; 19th May; 12th and 25th June; 21st July; 15th August; 24th October; 10th November. 1858, 20th January; 18th May; 10th July, 10th September; 15th and 27th November.
52. No.
53. Two lamps, with burners complete. On the second floor of the tower. Diameter of oil room, 14 feet 6 inches; height, 11 feet 6 inches.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

63.

BURNHAM, LOW.

On the Flat of the Berrow Sand.

3. William Jones, Bridgwater, Somerset.
4. Two. E. by S. $\frac{1}{4}$ S.; W. by N. $\frac{1}{4}$ N. 500 yards.
- 5, 6, 7. As in Return for High Light.
8. 1st December 1832.
9. Builder, Engineer, and Superintendent of the Works, Joseph Nelson. Not by contract.
10. Local.
11. Wood; on a framing of timber, 10 feet square in the clear; piles are of oak; white, with a black streak down the centre of lighthouse one-third of its breadth.
12. No conductor.
13. 36 feet.
14. 23 feet.
15. 5 miles.
16. 9 miles.
17. 17°. N. 62 W.; N. 79 W.
18. Fixed; bright.
13. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. Two burners.
23. None.
24. Reflectors, Robinson and Wilkins, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, 14 in. diameter over the flames of the lamps, and by an opening 16 inches square in ceiling of lighthouse.
26. None.
27. None.
28. 52 days.
29. See Return for Burnham High Light.
30. Completed.
31. Lightroom window, 2 feet 6 inches square.
32. Not purchased. See Return for Burnham High Light.
33. See Return for Burnham High Light.
34. Ditto, ditto.
35. Three (for both lights); one at 65*l*., and two at 45*l*. each per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 60*l*. 1*s*. 9*d*., fitted by workmen on High Light repairs.
37. See Return for Burnham High Light.
38. 1857, oil, 79 gallons; wicks, 11 dozen. 1858, oil, 77 gallons; wicks, 11 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 1*s*. 6*d*. per gross. 1857, 2*s*. 3*d*. 1858, 2*s*. 3*d*.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Burnham High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 16th July (weather prevented a landing); 17th July. 1858, 18th June. Agent: 1857, 31st January; 19th February; 26th March; 29th April; 19th May; 12th and 25th June; 31st July; 15th August; 24th October; 19th November. 1858, 20th January; 18th May; 10th July; 10th September; 15th and 27th November.
52. No.
53. One lamp, with burner complete; in the oil room of High Lighthouse.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

64.

AVON.

East Side of Entrance to the River.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. June 1833.
6. Joseph T. Price, of Neath, and other owners of steam packets, and Chamber of Commerce of Bristol. See Lighthouses, General Return, 19.
7. To mark the entrance of the Avon.
8. 25th May 1840.
9. Builders, Thomas Willcox and Sons, Bristol. Engineer, James Walker, Superintendent of the Works, — Knight. By contract.
10. Sea light.
11. Brick; solid walls, coated with cement, at base 4 feet 6 inches, at top 2 feet 3 inches; white; octagonal; lantern gallery open stone work.
12. Dr. Faraday's.
13. 85 $\frac{1}{2}$ feet.
14. 73 feet.
15. 9 $\frac{1}{2}$ miles.
16. 10 miles.
17. 225°. S. 8 E.; N. 39 E.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 5 refractors of 8 to the circle, fountain, 3 concentric wick lamp, with regulating condenser; red shade outside the lens.
22. 2nd order.
23. April 1849, concave mirrors taken away by direction of the Board. 10th June 1854, red shade fitted on suggestion of an Inspecting Committee in April 1854, to mark the entrance to the swatheway. No alteration in character.
24. Refractors, Isaac Cookson and Company, Newcastle. Frame, lamps, &c., R. Wilkins and Son.
25. Faraday's tube, 3 $\frac{3}{4}$ inches diameter over the flame of the lamp. No other mode.
26. None.
27. None.
28. 44 days.
29. Lighthouse and adjoining buildings, 5,897*l*. 1*s*. 8*d*.; bridge, 255*l*.; site, 100*l*.
30. Completed.
31. Diameter, 13 feet. Height; pedestal, 3 feet 3 inches; glass, 7 feet 9 inches; glass to vane, 10 feet; total, 22 feet. Total cost, 1,231*l*. 1*s*. 6*d*.
32. Not purchased.
33. 2*l*. 11*s*. 8*d*. since construction.
34. 25*l*. 16*s*. 2*d*.; not by contract; once in four years.
35. Two; one at 65*l*. and one at 45*l*. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Apparatus, including transport, 596*l*. 0*s*. 6*d*.; fitting, 139*l*. 14*s*. 9*d*.
37. 1857, 13*l*. 11*s*. 4*d*. 1858, 26*l*. 2*s*. 6*d*.
38. 1857, oil, 252 gallons; wicks, 27 yards. 1858, oil, 254 gallons; wicks, 28 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 6*d*. per yard. 1857, 14*s*. 7*d*. 1858, 1*s*. 2*d*.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for English and Welsh Grounds Lightvessel.
44. 1859, 201*l*. 9*s*. 8*d*. 1858, 183*l*. 10*s*. 5*d*. See General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th March; 16th July. 1858, 17th June. Agent: 1857, 10th March; 20th November. 1858, 13th April; 12th December.
52. No.
53. 1 lamp, 3 burners, 1 refractor, 1 reservoir, and 1 receiver; on ground floor of the tower; diameter of oil cellar, 13 feet; height of ditto, 8 feet.
54. Barometer, with thermometer attached; external and internal thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

65.

USK.

Western Side of Entrance to the River.—
Upper Light, the Bright one.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Three in one tower; two in lantern, one bright, one red. Upper 23½ feet above lower light.
5. 1807; renewed February 1820.
6. 1807, by the Canal Company and trade of Newport and its neighbourhood. 1820, by Sir Chas. Morgan and trade of Newport, &c. See Lighthouses, General Return, 19.
7. To mark the entrance of the Usk River.
8. 1st December 1821.
9. Builders, Benjamin Batchelor and John Williams, of Newport. Engineer, James Walker. Superintendent of the Works, Ralph Walker. By contract.
10. Local.
11. Brick; solid wall, at base 2 feet 6 inches, at top 1 foot 9 inches; coated with cement; white; circular leaning tower; semicircular lantern-gallery.
12. Dr. Faraday's.
13. 55 feet.
14. 39 feet.
15. 6½ miles.
16. 11 miles.
17. 130°. S. 54 E.; S. 76 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ⅔ of an inch, and parabolic reflectors, 21 inches diameter, 7 inches deep; reflectors arranged concavely.
22. Nine burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, 1½ in. diameter over the flames of the lamps.
26. None.
27. None.
28. 13 days.
29. Lighthouse, including lantern and apparatus, 2,057*l.* 10*s.* 4*d.*; adjoining buildings, 2,346*l.* 4*s.* 2*d.*
30. Completed.
31. Diameter, 12 feet 3 inches. Height: floor to glass, 3 feet 6 inches; glass, 5 feet; glass to vane, 15 feet 6 inches; total, 24 feet. Included in cost of lighthouse.
32. Not purchased.
33. 13*l.* 17*s.* 6*d.*, including upper, red, and lower light, since construction.
34. 13*l.* 0*s.* 10*d.*; not by contract; once in four years.
35. Two (for the three lights); one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in cost of lighthouse.
37. 1857, 6*l.* 11*s.* 1*d.*, the three lights. 1858, 13*l.* 14*s.*, ditto.
38. 1857, oil, 445 gallons; wicks, 106 dozen, for the three lights. 1858, oil, 451 gallons; wicks, 103 dozen, ditto.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 22*s.* 1*d.* 1858, 21*s.* 5½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 206*l.* 12*s.* 10½*d.* 1858, 192*l.* 1*s.* Total for 1852, 824*l.* 14*s.* 9½*d.*
44. 1852, 206*l.* 2*s.* 3*d.*; 1858, 206*l.* 5*s.* 7*d.* the three lights. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th March; 18th July. 1858, 18th June. Agent: 1857, 10th and 16th March; 20th November. 1858, 15th April; 5th December.
52. No.
53. Six lamps, with burners complete; lower room of the light-house. Dimensions of oil room: width, 14 feet; length, 12 feet; height, 7 feet 8 inches.
54. Barometer with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

66.

USK.

Western Side of Entrance to the River —
Upper Light, the Red one.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Three in one tower; two in lantern, one red, one bright. Upper 23½ feet above lower light.
5. No application. Proposed by the Board, October 1843.
6. No application. See Lighthouses, General Return, 19.
7. To show up the River Usk towards Newport.
8. 28th December 1843.
9. As in Return for Upper (Bright) Light.
10. Local.
- 11, 12, 13. As in Return for Upper (Bright) Light.
14. 39 feet.
15. 6½ miles.
16. 9 miles.
17. 15°. N. 37 E.; N. 52 E.
18. Fixed; red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamp, burner ⅔ of an inch, and parabolic reflector 12 inches diameter, 4½ inches deep; red shade on the reflector.
22. One burner.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tube, 1½ inch diameter over the flame of the lamp. No other mode.
26. None.
27. None.
28. 13 days.
29. See Return for Upper (Bright) Light.
30. Completed.
31. Window in lantern; height, 3 feet 6 inches; width, 2 feet.
32. Nut purchased.
33. See Return for Upper (Bright) Light.
- 34, 35. As in Return for Upper (Bright) Light.
36. Ditto, ditto.
37. Ditto, ditto.
38. Included in consumption of Upper (Bright) Light.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. Cost included with Upper Bright Light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Usk Upper (Bright) Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th March; 18th July. 1858, 18th June. Agent: 1857, 10th and 16th March; 20th November. 1858, 15th April; 5th December.
52. No.
53. One lamp, with burner complete; lower room of the light-house. Dimensions of the oil room; width, 14 feet; length, 12 feet; height, 7 feet 8 inches.
54. Barometer, with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

67.

USK.

Western Side of Entrance to the River.—
Lower Light.

3. R. H. Bailey, Milford, Pembrokeshire.
4. Three in one tower. Lower 23½ feet below the upper lights.
5. No application. Proposed by an Inspecting Committee in September 1854.
6. No application. See Lighthouses, General Return, 19.
7. To mark entrance of Channel between the buoys.
8. 8th December 1854.
9. As in Return for Upper (Bright) Light.
10. Local.
- 11, 12, 13. As in Return for Upper (Bright) Light.
14. 15½ feet.
15. 4 miles.
16. 6 miles.
17. 15°. N. 9 W.; N. 24 W.
18. Fixed; red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamp, burner ½ of an inch, and parabolic reflector 2½ inches diameter. 8½ inches deep; red shade on lightroom window.
22. One burner.
23. None.
24. William Wilkins, London.
25. None.
- 26, 27, 28, 29. As in Return for Upper (Bright) Light.
30. Completed.
31. No lantern. Lightroom window: height, 2 feet 11 inches; width, 2 feet.
32. Not purchased.
- 33, 34, 35. As in Return for Upper (Bright) Light.
36. 42l. 18s. 3d., fitted complete.
37. Included in Return for Upper (Bright) Light.
38. Included in consumption of Upper (Bright) Light.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2s. 6d. per gross. Cost included with Upper (Bright) Light.
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Usk Upper (Bright) Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. As in Return for Upper (Bright) Light.
52. No.
53. One lamp with burner complete; lower room of the lighthouse.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

68.

FLATHOLM.

South Point of the Island, off Cardiff.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. January 1732.
6. William Crispe and the Corporation of Merchant Adventurers and other traders (127 in number) of the City of Bristol using the Bristol Channel. See Lighthouses, General Return, 19.
7. To mark the island and adjacent dangers.
8. 1737; 7th September 1820 as an oil light; 5th August 1839 as a dioptric light.
9. Not known; built by the lessee.
10. Sea light.
11. Stone; solid wall, at base 6 feet, at top 2 feet 9 inches; coated with cement; white; circular; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 90 feet.
14. 156 feet.
15. 13½ miles.
16. 18 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 10 refractors of 10 to the circle, with 5 tiers of concave mirrors above the refractors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. None.
24. Optical portions, Isaac Cookson and Co., Newcastle-on-Tyne. Frame of apparatus, R. Wilkies and Son, London. Lamps, &c., W. Wilkins and Co., London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp.
26. None.
27. None.
28. 73 days.
29. Lighthouse and adjoining buildings not known; built by lessee; site, 67l. 4s. 10d.
30. Completed.
31. Diameter, 11 feet 6 inches. Height: pedestal, 4 feet; glass, 6 feet; glass to vane, 10 feet; total, 20 feet. Not known.
32. 16,057l. 9s. 6d.; March 1823.
33. 20l. 2s. 5d. since purchase.
34. 30l. 7s. 4d.; not by contract; once in four years.
35. Two; one at 65l., and one at 45l. per annum; a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 980l. 6s. 5d.; 192l. 0s. 3d.; 20l. 10s. 7d.
37. 1857, 15l. 1s. 1858, 17l. 5s. 2d.
38. 1857, oil, 509 gallons; wicks, 78 yards. 1858, 549 gallons; wicks, 84 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½d. per yard. 1857, 2l. 8s. 9d. 1858, 2l. 12s. 6d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 458l. 7s. 11½d. Midsummer quarter, 1858, 369l. 0s. 4d. Total income, 1852, 1,695l. 11s. 7½d.
44. 1852, 240l. 12s. 4d. 1858, 240l. 2s. 10d. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 10th March, 16th July. 1858, 16th June. Agent: 1857, 10th March, 26th November. 1858, 16th April, December (weather prevented a landing).
52. No.
53. Three burners, two reservoirs, one refractor; oil is stored in a room adjoining the tower, on the north side of it. Length, 19 feet; width, 10 feet 6 inches; height, 9 feet 5 inches.
54. Barometer, with thermometer attached, and internal and external thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

69.

NASH, EASTERN or HIGH.

On the Nash Point.

3. B. H. Bailey, Milford, Pembrokehire.
4. Two. N.W. by W. $\frac{1}{4}$ W.; S.E. by E. $\frac{1}{4}$ E. 333 yards.
5. February 1830.
6. Thomas Protheroe, of Newport, and 439 owners or masters of vessels of the principal ports in the Bristol Channel. See Lighthouses, General Return, 19.
7. In line with the low, to lead clear of the dangers to the westward.
8. 1st September 1832.
9. Builder and engineer, Joseph Nelson. Superintendent of the Works, George Burrell. Not by contract.
10. Sea light.
11. Stone; solid wall; at base 4 feet 2 inches, at top 2 feet. not coated; white; circular; stone lantern gallery with iron railing.
12. Dr. Faraday's.
13. 113 feet.
14. 167 feet.
15. 13 $\frac{3}{4}$ miles.
16. 19 miles.
17. 163°. S. 34 E., N. 51 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, No. 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep, arranged concavely in two tiers.
22. 13 burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ inch diameter over the flames of the lamps, and ventilators in the lantern pedestal.
26. None.
27. None.
28. 23 days.
29. Two light towers and adjoining buildings, 5,796*l.* 14*s.* 1*d.* Site, 252*l.* 17*s.* 11*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet; glass, 6 feet 1 inch; glass to vane, 10 feet 11 inches; total, 21 feet. Price 603*l.* 16*s.* 11*d.*
32. Not purchased.
33. 40*l.* 7*s.* (including Western Light) since construction.
34. 33*l.* (including Western Light). Not by contract. Once in four years.
35. Three for both lights; one at 65*l.* and two at 45*l.* each per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Apparatus, 415*l.* 3*s.* 3*d.* Fitting (both lights), 83*l.* 7*s.* Transport (both lights), 128*l.*
37. 1857, 17*l.* 5*s.* 1*d.*, including Western Light. 1858, 17*l.* 18*s.* 4*d.*, ditto.
38. 1857, oil, 450 gallons; wicks, 101 dozen. 1858, oil, 488 gallons; wicks, 98 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 1*s.* 0 $\frac{1}{2}$ *d.* 1858, 1*l.* 0*s.* 5*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 499*l.* 0*s.* 6 $\frac{1}{2}$ *d.* Do., 1858, 436*l.* 14*s.* 8*d.* Total income for 1852, 1,824*l.* 12*s.* 10*d.*
44. 1852, 399*l.* 7*s.* 11*d.*, both lights. 1858, 375*l.* 19*s.* 10*d.*, ditto. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 15th July. 1858, 17th June; 16th June, weather prevented a landing. Agent: 1857, 9th March. 1858, 15th April.
52. No.
53. 6 lamps, with burners complete. In the basement of the tower. Diameter of oil cellar, 19 feet 6 inches; height, 13 feet.
54. Barometer with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

70.

NASH, WESTERN or LOW.

On the Nash Point.

3. B. H. Bailey, Milford, Pembrokehire.
4. Two. N.W. by W. $\frac{1}{4}$ W., S.E. by E. $\frac{1}{4}$ E. 333 yards.
5. February 1830.
6. Thomas Protheroe, of Newport, and 439 owners or masters of vessels of the principal ports in the Bristol Channel. See Lighthouses, General Return, 19.
7. In line with the high, to lead clear of the dangers to the westward.
8. 1st September 1832.
9. Builder and Engineer, Joseph Nelson. Superintendent of the Works, George Burrell. Not by contract.
10. Sea light.
11. Stone; solid wall, at base 3 feet 6 inches, at top 2 feet; coated with mastic; white; circular; stone lantern gallery with iron railings.
12. Dr. Faraday's.
13. 67 feet.
14. 123 feet.
15. 11 $\frac{1}{2}$ miles.
16. 17 miles.
17. 180°. S. 17 E., N. 17 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep, arranged concavely in two tiers.
22. 12 burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ inch in diameter over the flames of the lamps, and ventilators in the lantern pedestal.
26. None.
27. None.
28. 23 days.
29. See Return for Eastern or High Light.
30. Completed.
31. Diameter, 13 feet. Height: pedestal, 4 feet; glass, 6 feet 1 inch; glass to vane, 10 feet 11 inches; total, 21 feet. Price 603*l.* 16*s.* 10*d.*
32. Not purchased.
33. See Return for Eastern or High Light.
34. Ditto, ditto.
35. Three (for both lights); one at 65*l.* and two at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 388*l.* 11*s.* 3*d.* Fitting and transport included in that of Eastern Light.
37. See Return for Eastern or High Light.
38. 1857, oil, 412 gallons; wicks, 74 dozen. 1858, oil, 427 gallons; wicks, 72 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 15*s.* 5*d.* 1858, 15*s.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Included in Return for Eastern or High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of Elder Brethren and Agent.
51. Committees: 1857, 9th March. 1858, 17th June; 16th June, weather preventing landing. Agent: 1857, 9th March. 1858, 15th April.
52. No.
53. 6 lamps, with burners complete. Under the basement of tower. Diameter of oil cellar, 15 feet 6 inches; height, 9 feet 6 inches.
54. Internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

71.

CALDY.

South Part of the Island.

3. Cabot Kynaston, Caldy Island, near Tenby.
4. One light.
5. March 1827.
6. Thomas Becroft (for the Pembrey Iron and Coal Company), the Corporation of Carmarthen, and the trade to ports and places in Carmarthen Bay. See Lighthouses, General Return, 19.
7. To mark the island.
8. 26th January 1829.
9. Builder, Engineer, and Superintendent of the Works, Joseph Nelson. Not by contract.
10. Local light.
11. Limestone, with an interior lining of brick; solid wall, at base 3 feet, at top 2 feet 6 inches; not coated; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 56 feet.
14. 210 feet.
15. 15½ miles.
16. 20 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors, 13 of them, 21 inches diameter, 9 inches deep, and four 20 inches diameter, 8 inches deep, and three 22 inches diameter, 7 inches deep.
22. 20 burners.
23. 1846, two burners added and two red shades fitted by direction of the Board. 1st November 1855, two red shades taken away. No alteration in character.
24. Reflectors, &c., Messrs. Robinson and Wilkins, London. Lamps, R. Wilkins and Son, London.
25. Faraday's tubes, 11 inch diameter over the flames of the lamps, and by ventilators in the upper and lower parts of lantern pedestal.
26. None.
27. None.
28. 24 days.
29. Lighthouses, 2,071l. 0s. 1d.; adjoining buildings, 1,309l. 11s. 6d.; site, 440l. 7s. 3d.
30. Completed.
31. Diameter, 12 feet. Height; pedestal, 4 feet; glass, 6 feet; glass to vane, 12 feet; total, 22 feet. Total cost, 648l. 10s. 11d.
32. Not purchased.
33. 16l. 6s. 8d. since construction.
34. 19l. 19s. 7d.; not by contract; once in four years.
35. Two; one at 65l. per annum, and one at 40l. 10s. per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 326l. 17s.; 139l. 10s. 8d.; 46l. 12s. 10d.
37. 1857, 18l. 14s. 1d. 1858, 7l. 18s. 9d.
38. 1857, oil, 773 gallons; wicks, 145 dozen. 1858, oil, 785 gallons; wicks, 130 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2s. 6d. per gross. 1857, 1l. 10s. 2½d. 1858, 1l. 7s. 1d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 193l. 14s. 1d. Do., 1858, 161l. 16s. 5d. Total income for 1852, 584l. 12s. 1d.
44. 1852, 348l. 17s. 9d. 1858, 371l. 11s. 3d. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 6th March; 14th July. 1858, 12th and 16th June. Agent resides near the lighthouse; dates of inspection not recorded.
52. No.
53. Nine lamps, with burners complete; on the lower floor of the tower. Diameter of oil cellar, 12 feet 6 inches; height of ditto, 10 feet 6 inches.
54. Barometer, with thermometer attached, and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

72.

ST. ANN'S HEAD, HIGH.

Milford Haven.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two lights; N. by W. ½ W.; S. by E. ½ E. 203 yards.
5. March 1712.
6. Captain Thomas Hide and Mr. Joseph Allen. See Lighthouses, General Return, 19.
7. To indicate entrance to Milford Haven. Lights in line clear Crow and Toe Rocks.
8. 1714. 20th June 1800 as an oil light; 21st January 1851 as a dioptric light.
9. Not known; built by lessees.
10. Sea light.
11. Stone; solid wall; coated with cement; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 75 feet.
14. 192 feet.
15. 14½ miles.
16. 20 miles.
17. 270°. N. 72 E.; N. 18 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 6 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors. Fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 1851, present apparatus fitted in lieu of catoptric apparatus by direction of the Board. No alteration in character.
24. Optical parts, Henry Lepante, Paris. Frame, lamps, &c., William Wilkins, London.
25. Faraday's tube, ¾ inches diameter over the flame of the lamp, and by openings in lantern pedestal.
26. None.
27. None.
28. 47 days.
29. Lighthouse not known; built by lessee. A dwelling, 982l. 6s. 10d.; site, 390l. 7s. 7d.
30. Completed.
31. Diameter, 14 feet. Height; pedestal, 5 feet 1 inch; glass, 10 feet; glass to vane, 12 feet 1 inch; total, 27 feet 2 inches. Total cost, 3,129l. 18s. 4d.
32. Not purchased. Lease expired about 1800.
33. 25l. 13s. 4d. since 1822 (including Low Light).
34. 19l. 2s. 6d. Not by contract. Once in four years (including Low Light).
35. Three (for both lights); one at 65l. per annum, and two at 45l. each per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Apparatus 1,152l. 10s. 8d., fitting included in cost of lantern; transport, 17l. 14s. 7d.
37. 1857, 17l. 5s. 7d. (including Low Light). 1858, 13l. 4s. 8d., ditto.
38. 1857, oil, 640 gallons; wicks, 108 yards. 1858, oil, 622 gallons; wicks, 87 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½d. per yard. 1857, 3l. 7s. 6d. 1858, 2l. 14s. 4½d.
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,571l. 10s. 11½d. 1858, 1,361l. 1s. 5d. Total for 1852, 6,040l. 2s. 7½d.
44. 1852, 511l. 7s. 5d. (including Low Light). 1858, 451l. 7s. 11d. ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 6th March; 2nd July; 20th October. 1858, 15th January; 14th March. Agent: 1857, 29th January; 2nd and 6th March; 29th May; 14th August; 19th September; 15th October. 1858, 26th February; 24th March; 27th April; 4th June; 12th July; 11th August; 29th October.
52. No.
53. Three lamps; on the ground floor of the tower. Dimensions of oil room, 14 feet by 9 feet 6 inches; height, 9 feet.
54. Barometer, with thermometer attached; external and internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

73.

ST. ANN'S HEAD, LOW.

Milford Haven.

3. B. H. Bailey, Milford, Pembrokeshire.
4. Two. N. by W. $\frac{1}{2}$ W.; S. by E. $\frac{1}{2}$ E. 203 yards.
5. March 1712.
6. Captain Thomas Hide and Mr. Joseph Allen. See Lighthouses, General Return, 19.
7. To indicate entrance to Milford Haven; lights in line clear the Crow and Toe Rocks.
8. 1714. 20th June 1800 as an oil light.
9. See Return for St. Ann's Head High Light.
10. Sea light.
11. Stone; inner and outer wall; coated with cement; white; octagonal; stone lantern gallery with turreted parapet.
12. Dr. Faraday's.
13. 39 feet.
14. 159 feet.
15. 13 $\frac{1}{2}$ miles.
16. 18 miles.
17. 270°. N. 72 E.; N. 18 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 18 burners.
23. None.
24. Reflectors and frame, George Robinson, London. Lamps, &c., R. Wilkins and Son.
25. Faraday's tubes, $\frac{1}{2}$ inch diameter over the flames of the lamps, and by opening passage door.
26. None.
27. None.
28. 47 days.
29. New tower and dwellings in 1844, 5,375*l.* 18*s.* 3*d.*
30. Completed.
31. Diameter, 12 feet 6 inches. Height: pedestal, 4 feet; glass, 5 feet 6 inches; glass to vane, 6 feet 6 inches; total, 16 feet. 80*l.* 3*s.* 6*d.*
32. Not purchased; lease expired about 1800.
33. Included in High Light Return.
34. Ditto, ditto.
35. Three (for both lights); one at 65*l.* per annum, two at 45*l.* per annum each, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Part renewal, 1844, 234*l.* 5*s.* 3*d.* Original cost not known.
37. Included in High Light Return.
38. 1857, oil, 663 gallons; wicks, 132 dozen. 1858, oil, 658 gallons; wicks, 125 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 7*s.* 6*d.*; 1858, 1*l.* 6*s.* 0*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. See Return for Milford High Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 6th March; 22nd July; 20th October. 1858, 15th January; 14th March. Agent: 1857, 29th January; 2nd and 6th March; 20th May; 14th August; 19th September; 15th October. 1858, 26th February; 24th March; 27th April; 4th June; 12th July; 11th August; 29th October.
52. No.
53. Two lamps, with burners complete. On the ground floor, north end of dwelling. Dimensions of oil room, 8 feet 6 inches by 9 feet 8 inches.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

74.

SMALLS.

The Smalls Rock.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. 1776.
6. Mr. John Phillips, and merchants of Liverpool and other ports interested in the trade of the Irish and Bristol Channels. See Lighthouses, General Return, 19.
7. To mark the rock.
8. 1778.
9. Builder and Engineer, Henry Whiteside. Whether by contract or otherwise, not known. New stone tower now in course of erection.
10. Sea light.
11. Wood, on oak pillars, 40 feet high; red, with white top; pillars (9 in number), black. Lantern gallery, with flag-staff.
12. Dr. Faraday's.
13. 71 feet.
14. 65 feet.
15. 8 $\frac{1}{2}$ miles.
16. 13 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
- 22, 23. Burners.
23. None.
24. Reflectors and frame, George Robinson, London. Lamps, R. Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ inch diameter over the flames of the lamps, also by openings in the lantern floor, and in the pedestal and top of lantern.
26. None.
27. None.
28. 18 days.
29. Not known. Built by private proprietor.
30. Completed.
31. Diameter, 13 feet. Height: pedestal, 4 feet; glass, 6 feet; glass to vane, 12 feet; total, 22 feet.
32. 170,468*l.* 7*s.*; 26th March 1836.
33. 104*l.* 3*s.* 3*d.*, including painting since purchase. By contract.
34. Included in cost of repairs. Annual contract for works required.
35. Four; one at 60*l.* per annum, two at 49*l.* 10*s.* each, and one at 48*l.* per annum, and 1*s.* 6*d.* per diem for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Not known.
37. 1857, 27*l.* 8*s.* 11*d.* 1858, 15*l.* 5*s.* 1*d.*
38. 1857, oil, 1,190 gallons; wicks, 212 dozen. 1858, 1,199 gallons; wicks, 232 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 2*l.* 4*s.* 2*d.* 1858 2*l.* 8*s.* 4*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 6,045*l.* 12*s.* 3*d.* 1858, 4,938*l.* 6*s.* 6*d.* Total for 1852, 22,756*l.* 2*s.* 7*d.*
44. 1852, 627*l.* 15*s.* 1858, 556*l.* 19*s.* 11*d.* See General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 27th April; 20th July. 1858, 19th July. Agent: 1857, 18th August; 29th January and 2nd March, weather prevented a landing. 1858, 24th March; 1st November; 30th October, weather prevented a landing.
52. No.
53. Six lamps, with burners complete. In a small general store-room under lantern, and in a cellar made in the rock. Dimensions of oil cellar about 10 feet long, 6 feet broad, 6 feet deep.
54. Aneroid barometer, with thermometer attached; internal thermometer and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month; three of the four keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by steam vessel, and occasionally by hired pilot smack.

CORPORATION OF TRINITY HOUSE, LONDON.

75.

SOUTH BISHOP.

The Easternmost or Highest Point of the Rock.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. October 1831; June 1834.
6. 1831, trade of Cardigan, (per J. Lloyd, Collector of Customs). 1834, David Probert (per Sir John Owen), and the trade of the Bristol and St. George's Channels. See Lighthouses, General Return, 19.
7. To mark the dangers of the locality.
8. 14th February 1839. 5th August 1858 as a dioptric light.
9. Engineer, James Walker. Superintendents of the Works, D. Frazer and G. Burrell. Not by contract.
10. Sea light.
11. Stone; solid wall; coated with cement; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 37 feet.
14. 144 feet.
15. 12½ miles.
16. 18 miles.
17. 360°. The whole circle.
18. Revolving; bright.
19. Perfect revolution in 2 minutes 40 seconds, showing a flash every 20 seconds.
20. See Lighthouses, General Return, 19.
21. Dioptric; 8 polygonal lenses of 8 to the circle; fountain, 4 concentric wick lamp, with regulating condenser. Clock-work revolving machine.
22. 1st order.
23. 5th August 1858, light made dioptric, previously "catoptric;" 8 Argand lamps and parabolic reflectors. Alteration suggested by a Committee of the Elder Brethren. No alteration in "character."
24. Optical parts, Isaac Cookson and Company, Newcastle. Frame, lamps, &c., W. Wilkins and Company, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp.
26. None.
27. None.
28. 47 days.
29. Lighthouse and buildings, 11,255*l.* 5*s.* 11*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 10 feet; glass to vane, 12 feet 6 inches; total, 27 feet. Price 1,493*l.* 8*s.* 6*d.*
32. Not purchased.
33. 16*l.* 1*s.* 6*d.* since construction.
34. 20*l.* 12*s.* 6*d.*; not by contract; once in four years.
35. Three; one at 60*l.*, one at 49*l.* 10*s.*, one at 48*l.* per annum, 1*s.* 6*d.* per diem for victualling, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Present apparatus removed from Lundy. (Original cost, 1,452*l.* 3*s.* 3*d.*), altered and fitted, 198*l.* 8*s.*
37. 1857, 8*l.* 13*s.* 1*d.*, as a catoptric light. 1858, 7*l.* 9*s.* 8*d.*, as a dioptric light.
38. 1857, oil, 972 gallons; wicks, 64 dozen. 1858, oil, 375 gallons; wicks, 34 dozen and 95 yards.
39. See Lighthouses, General Return, 19.
40. Argand and concentric cotton, 2*s.* 6*d.* per gross, 7½*d.* per yard. 1857, 13*s.* 4*d.*. 1858, 7*s.* 1*d.*; 1*l.* 1*s.* 10½*d.*; total, 1*l.* 8*s.* 11½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 187*l.* 10*s.* 1½*d.*. Ditto, 1858, 85*l.* 13*s.* 6*d.*. Total for 1852, 494*l.* 0*s.* 6½*d.*
44. 1852, 350*l.* 18*s.* 2*d.*. 1858, 356*l.* 0*s.* 4*d.*. See General Return, 19.
45. 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 27th April; 20th July, state of the tide prevented a landing. 1858, 19th July; 14th June, state of the tide prevented a landing. Agent: 1857, 29th January; 17th August; 2nd March, weather prevented a landing. 1858, 24th March; 1st November; 30th October, weather prevented a landing.
52. No.
53. 3 lamps, 3 burners; in the basement of the tower; diameter of oil cellar, 12 feet; height, 9 feet.
54. Barometer, with thermometer attached; external and internal thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Once a month; two of the three keepers are constantly at the lighthouse, and one on shore in rotation. Relieved by steam vessel, occasionally by hired pilot smack.

76.

BARDSEY.

South-west Part of Bardsey Island.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. September 1816; renewed April 1820.
6. 1816, Lieutenant Thomas Evans, R.N. 1820, trade of Carnarvon and principal ports in the Bristol Channel, also ports in St. George's Channel (except Liverpool), and the Shipowners' Society of London. See Lighthouses, General Return, 19.
7. To mark the projecting point between Cardigan and Carnarvon Bays.
8. 24th December 1821. 1st August 1838 as a dioptric light.
9. Builder and Engineer, Joseph Nelson. Contract for stone only, William Thomas.
10. Sea light.
11. Grey marble; solid walls, at base 4 feet 3 inches, at top 3 feet; not coated; white; four-sided or square; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 102 feet.
14. 132 feet.
15. 12½ miles.
16. 17 miles.
17. 315°. S. 87 E., N. 48 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 7 refractors of 8 to the circle, with 19 zones of prisms, 15 above and 6 below the refractors; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. 26th November 1856, present apparatus fitted by direction of the Board. No alteration in "character."
24. R. L. Chance, Brothers, and Company, Birmingham.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and by ventilators in the lantern pedestal.
26. None.
27. None.
28. 39 days.
29. Lighthouse and buildings, 5,470*l.* 12*s.* 6*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 6 feet 6 inches; glass, 10 feet; glass to vane, 12 feet 6 inches; total 29 feet. Price 2,550*l.* 16*s.* 7*d.*
32. Not purchased.
33. 35*l.* 10*s.* 8*d.* since construction.
34. 21*l.* 16*s.* 6*d.*; not by contract; once in four years.
35. Two; one at 65*l.*, one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 1,349*l.*; 35*l.* 7*s.*; 90*l.*
37. 1857, 89*l.* 14*s.* 3*d.*. 1858, 3*l.* 16*s.* 1*d.*
38. 1857, oil, 439 gallons; wicks, 42 yards. 1858, oil, 443 gallons; wicks, 42 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 1*l.* 6*s.* 3*d.*. 1858, 1*l.* 0*s.* 3*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 927*l.* 14*s.* 5½*d.*. Ditto, 1858, 652*l.* 2*s.* 9*d.*. Total for 1852, 3,069*l.* 14*s.* 3½*d.*
44. 1852, 231*l.* 19*s.* 6*d.*. 1858, 231*l.* 7*s.* 4*d.*. See Lighthouses, General Return, 19.
45. 46. See Lighthouses, General Return, 19.
47. On oversca voyages the Bardsey light is chargeable once only for the whole voyage out and home, but is collected on the first half of the voyage, that is to say, on the outwards passage of a British ship, and on the inward passage of a foreigner. In September, 1856, a letter was received from the Collector at Liverpool, advising that it should be collected on the inward passage from all oversca vessels indiscriminately, lest the distinction British exempt in and foreign chargeable in, should give rise to an impression that the privileged vessels were subject to greater exaction than British ships. The Elder Brethren considered it would be objectionable to pursue a different course at Liverpool to that followed at other ports, and that the alteration suggested might probably involve a loss of revenue, but that a notice should be posted up at the Custom House explanatory of the charge for the Bardsey light, to prevent any erroneous impression as to foreigners paying more for the entire voyage than British ships.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent.
51. Committees: 1857, 5th March; 27th April; 20th July, 1858, 16th January; 20th July. Agent: 1857, 5th March, 1858, 23rd March.
52. No.
53. Four burners. On the lower or basement floor. Dimensions of oil room, 14 feet 3 inches by 10 feet 10 inches; height, 8 feet 6 inches.
54. Barometer, with thermometer attached; external and internal thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

77.

SOUTH STACK, UPPER.

The South Stack Rock off the N.W. Point of Holyhead Island.

3. B. H. Bailey, Milford, Pembrokehire.
4. Two; north and south; 42 yards. The south light is an "occasional" light shown in foggy weather only.
5. December 1807.
6. Trade of London, and of Liverpool, Dublin, and other ports in St. George's Channel. See Lighthouses, General Return, 19.
7. To mark the westernmost projecting rock off Holyhead.
8. 9th February 1809.
9. Builder, Joseph Nelson. Engineer, Daniel Alexander. Not by contract.
10. Sea light.
11. Rough stone; solid wall, at base 3 feet 6 inches, at top 2 feet 9 inches; not coated; white; circular; lantern gallery with iron railings.
12. Dr. Faraday's.
13. 84 feet.
14. 201 feet.
15. 15 miles.
16. 20 miles.
17. 229°. S. 11 W.; N. 60 E.
18. Revolving; bright.
19. Perfect revolution in six minutes, showing a face every two minutes.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clockwork revolving machine.
22. 21 burners.
23. None.
24. Reflectors and frame, George Robinson, London. Lamps, &c., Robert Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ in. diameter over the flames of the lamps, ventilators in floor and roof of lantern and in lantern pedestal.
26. Bell of 42 cwt., sounded by clockwork machinery.
27. 27 days.
28. 30 days.
29. Lighthouse, lantern, and apparatus, 11,828*l.* 17*s.* 9*d.*; bridge, 1,046*l.* 11*s.* 8*d.*; dwellings, 1,506*l.*
30. Completed.
31. Diameter, 13 feet 6 inches. Height: pedestal, 3 feet 9 inches; glass, 8 feet; glass to vane, 11 feet 6 inches; total, 23 feet 3 inches. Price included in cost of lighthouse.
32. Not purchased.
33. 27*l.* 16*s.* 9*d.* since 1822, including Low Light.
34. 17*l.* 14*s.* 3*d.* (including Low Light). Not by contract; once in four years.
35. Two (for both lights); one at 6*l.*, one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in cost of lighthouse.
37. 1857, 19*l.* 3*s.* 2*d.*; 1858, 18*l.* 14*s.* 10*d.*
38. 1857, oil, 891 gallons; wicks, 148 dozen. 1858, oil, 890 gallons; wicks, 147 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 10*s.* 10*d.* 1858, 1*l.* 10*s.* 7*½d.*
41. 72*l.* 16*s.* 7*d.*
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 1,553*l.* 11*s.* 0*½d.* Ditto, 1858, 1,046*l.* 12*s.* Total for 1852, 5,372*l.* 5*s.* 10*½d.*
44. 1852, 327*l.* 11*s.* 9*d.* 1858, 328*l.* 8*s.* 2*d.*, including Low Light. See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren; Agent in 1858.
51. Committees: 1857, 28th April; 20th July. 1858, 18th January; 21st July. Agent: 1857 (inspection prevented by illness), 1858, 23rd March.
52. No.
53. Three lamps, with burners complete; on ground floor of tower under first landing. Diameter of oil room, 14 feet 9 inches; height, 10 feet 4 inches.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

78.

SOUTH STACK, LOW, or "Occasional," for Foggy Weather.

Northern Face of the South Stack Rock.

3. B. H. Bailey, Milford, Pembrokehire.
4. Two; north and south. 42 yards.
5. No application.
6. Established by direction of the Board. See Lighthouses, General Return, 19.
7. See Return for South Stack High, or Upper, Light.
8. March 1832.
9. Builder and engineer, Hugh Evans. Not by contract.
10. Sea light.
11. Wood; solid, inch boarding; white; a moveable lightroom on wheels; four-sided.
12. No conductor.
13. Height of lightroom, 10 feet.
14. 50 feet.
15. 7 $\frac{1}{2}$ miles.
16. Lighted only in foggy weather.
17. 229°. S. 11 W.; N. 60 E.
18. Semi-revolving, or reciprocating; bright.
19. No perfect revolution, shows a face every 1 $\frac{1}{2}$ minutes.
20. From 9 p.m. on occasions only of thick or hazy weather (when the High or Upper Light is obscured).
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep. Clockwork revolving machine.
22. Three burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, $\frac{1}{2}$ inches diameter over the flames of the lamps, and by opening in bottom of lightroom.
26. Bell of 42 cwt. sounded by clockwork machinery.
27. 27 days.
28. 30 days.
29. Lightroom 12*l.* 5*s.* 6*d.*
30. Completed.
31. No lantern. Length of lightroom, 9 feet 10 inches; breadth, 6 feet 10 inches; height, 6 feet 6 inches; height of lightroom window, 1 foot 10 inches; width, 12 feet 7 inches.
32. Not purchased.
33. Included in Return for High or Upper Light.
34. Ditto, ditto.
35. See Return for High or Upper Light.
36. Apparatus, 117*l.* 6*s.* 9*d.*, fitting included in cost of lightroom; transport, *sl.*
37. Included in Return for High or Upper Light.
38. Included in consumption of High or Upper Light.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. Cost included with High or Upper Light.
41. See Return for High or Upper Light.
42. See Lighthouses, General Return, 19.
43. See Return for High or Upper Light.
44. Ditto, ditto.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren; Agent in 1858.
51. Committees: 1857, 28th April; 20th July; 1858, 18th January; 21st July. Agent: 1857 (inspection prevented by illness), 1858, 23rd March.
52. No.
53. None; at the Upper Light on the ground floor of the light-house under the first landing. Diameter of oil room, 14 feet 9 inches; height, 10 feet 4 inches.
54. None.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

79.

SKERRIES.

The Highest Island.

3. R. H. Bailey, Milford, Pembrokeshire.
4. One.
5. April, 1662; renewed, 1709.
6. First by Messrs. Ralph Aldridge and Henry Wyatt, and the trade of Liverpool, Chester, and other ports; renewed by Captain John Davison and the trade. See Lighthouses, General Return, 19.
7. For marking the Skerries Rocks.
8. 1714. 20th February 1804 as an oil light (and tower raised 22 feet.) 26th November 1844 as a dioptric light.
9. Not known. Built by private proprietor.
10. Sea light.
11. Anglessea stone; solid wall, at base 7 feet, at top 5 feet; coated with cement; white; circular; stone lantern gallery; no railing.
12. Dr. Faraday's.
13. 75 feet.
14. 117 feet.
15. 11½ miles.
16. 16 miles.
17. 360°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 8 refractors of 8 to the circle, with 19 zones of prisms, 13 above and 6 below the refractors, and strips of red glass outside the lens; fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. December 1851, zones substituted for mirrors by order of Board. 1860, a red shade will be fitted outside the lens, to strike the Coal Rock Buoy. No alteration in character.
24. Optical portions, Henry Lepaute, Paris. Frame, lamp, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter over flame of the lamp, and by a window opened from the lee side of the tower near the base.
26. None.
27. None.
28. 23 days.
29. Not known; constructed by private proprietor. Dwellings, 682*l.* 1*s.* 8*d.*
30. Completed.
31. Diameter, 14 feet. Height: pedestal, 4 feet 6 inches; glass, 10 feet; glass to vane, 11 feet; total, 25 feet 6 inches. Price 1,351*l.* 17*s.* 5*d.*
32. 444,984*l.* 11*s.* 3*d.*, 1st October 1841.
33. 44*l.* 2*s.* 8*d.* since purchase.
34. 28*l.* 16*s.* 3*d.* Not by contract. Once in four years.
35. Two; one at 79*l.*, one at 54*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Apparatus with mirrors, 979*l.* 5*s.* 2*d.*, fitting included in cost of lantern; transport, 58*l.* 9*s.* 6*d.*; zones in 1851, 1,027*l.* 12*s.* 1*d.*
37. 1857, 12*l.* 15*s.* 2*d.* 1858, 8*l.* 8*s.* 8*d.*
38. 1857, oil, 522 gallons; wicks, 48 yards. 1858, oil, 483 gallons; wicks, 48 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 1*l.* 10*s.* 1858, 1*l.* 10*s.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 5,210*l.* 4*s.* 4½*d.* 1858, 3,814*l.* 18*s.* 4*d.* Total for 1852, 18,567*l.* 3*s.* 6½*d.*
44. 1852, 3,34*l.* 18*s.* 11*d.* 1858, 325*l.* 16*s.* 10*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren; Agent in 1858.
51. Committees: 1857, 28th April; 21st July. 1858, 22nd January; 21st July. Agent: 1857 (inspections prevented by illness). 1858, 16th March.
52. No.
53. 3 burners, 1 reservoir, 1 receiver, 2 red shades. Oil is stored in basement of the tower. Diameter of cellar 12 feet; height, 7 feet.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved, but the two keepers are allowed to be on shore for a week each, once in the quarter. Supplies are taken off monthly by hired pilot boat.

80.

MENAI.

Trwyn-du or Black Point, N.E. Entrance of the Strait.

3. R. H. Bailey, Milford, Pembrokeshire.
4. One.
5. November 1833.
6. Trade of Liverpool, Carnarvon, Bangor, and Beaumaris (per Rear-Admiral the Hon. Sir Charles Paget). See Lighthouses, General Return, 19.
7. To mark the northern entrance to Menai Straits.
8. 28th June 1833.
9. Builder, David McIntosh. Engineer, James Walker. Superintendent of the Works, George Burrell. By contract.
10. Sea light and harbour light.
11. Stone; solid wall (entirely solid from 25 to 30 feet from the foundation), at base 6 feet, at top 2 feet; not coated; white, circular, with turreted parapet.
12. Dr. Faraday's.
13. 96 feet.
14. 61 feet.
15. 84 miles.
16. 9 miles.
17. 282°. N. 54 W., S. 48 W.
18. Fixed; red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 8 refractors of 10 to the circle; fountain; 4 concentric wick lamp, with regulating condenser. Red shade round the lamp.
22. 1st order.
23. None.
24. Refractors, Isaac Cookson and Co., Newcastle. Frames, lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and by windows of watchroom.
26. None.
27. None.
28. 14 days.
29. Lighthouse, 7,211*l.* 18*s.* 3*d.* Bridge and dwellings, 2,438*l.* 8*s.* 6*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet 6 inches; glass, 7 feet; glass to vane, 13 feet; total, 24 feet 6 inches. Price 1,245*l.* 12*s.* 10*d.*
32. Not purchased.
33. 28*l.* 6*s.* 10*d.* since construction.
34. 27*l.* 6*s.* 11*d.* Not by contract. Once in 4 years.
35. Two; one at 65*l.* and one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. 502*l.* 17*s.*; 156*l.* 18*s.* 6*d.*; 24*l.* 15*s.*
37. 1857, 59*l.* 18*s.* 8*d.* 1858, 13*l.* 1*s.* 7*d.*
38. 1857, oil, 450 gallons; wicks, 42 yards. 1858, oil, 420 gallons; wicks, 42 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 1*l.* 6*s.* 3*d.* 1858, 1*l.* 6*s.* 3*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1852, 295*l.* 8*s.* 9*d.* Do., 1858, 213*l.* 12*s.* 7*d.* Total income for 1852, 1,042*l.* 18*s.* 2*d.*
44. 1852, 294*l.* 7*s.* 1858, 235*l.* 18*s.* 9*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of Elder Brethren and Agent.
51. Committees: 1857, 29th April; 21st July. 1858, 25th July. Agent: 1857, 19th March. 1858, 20th March.
52. No.
53. 3 burners; oil stored on the first floor of tower; diameter of oil cellar, 14 feet 6 inches; height, 8 feet 6 inches.
54. Barometer, with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

81.

AIR.

On the Point of Air, River Dec, at Low Water Mark.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. February 1776.
6. Merchants, traders, and others residing in the port and city of Chester. See Lighthouses, General Return, 19.
7. For better marking the channel to the entrance of the Dec than the former site.
8. 1776, from the original tower; 12th September 1816 as an oil light; 11th February 1844, from pile lighthouse.
9. Builders, ironwork, Messrs. Gordon and Co., and Eytan and Co.; woodwork, J. Cartwright. Engineer, James Walker. Superintendent of the Works, James Lee. By contract.
10. Sea light and harbour light.
11. Iron on a hollow pile foundation; painted red; six-sided; open gallery with iron railing.
12. Dr. Faraday's.
13. 75 feet.
14. 42 feet.
15. 7 miles.
16. 9 miles.
17. 259°. W.; S. 11 E.
18. Fixed; bright and red.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep; red shade on two of the reflectors.
22. 9 burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, 13 inches diameter over the flames of the lamps; ventilators in lantern pedestal and air openings round the room below the lantern.
26. Bell of 3 cwt., sounded by clockwork machinery.
27. 32 days.
28. 32 days.
29. New Lighthouse (1844), 5,849*l.* 5*s.* 9*d.* Dwellings, 2,052*l.* 4*s.* 3*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet 6 inches; glass, 7 feet 6 inches; glass to vane, 12 feet; total, 24 feet. Lantern and alterations to apparatus (1844), 1,284*l.* 14*s.* 4*d.*
32. Not purchased.
33. 21*l.* 15*s.* 7*d.* since 1822.
34. 21*l.* 0*s.* 4*d.*; not by contract; once in four years.
35. Two; one at 65*l.*, one at 46*l.* 10*s.* per annum, a suit of clothes annually, and coal, oil, and furniture for living rooms.
36. Apparatus not known; alterations in 1844 included in price of lantern.
37. 1857, 8*l.* 17*s.* 1858, 5*l.* 7*s.* 9*d.*
38. 1857, oil, 411 gallons; wicks, 39 dozen. 1858, 419 gallons; wicks, 40 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 8*s.* 1*½d.* 1858, 8*s.* 4*d.*
41. 192*l.* 8*s.* 6*d.*
42. See Lighthouses, General Return, 19.
43. Midsummer quarter, 1858, 354*l.* 7*s.* 11*d.* Total income for 1858, 193*l.* 8*s.* 7*½d.* (includes buoys in the River Dec).
44. 1852, 24*l.* 19*s.* 7*d.* 1853, 236*l.* 14*s.* 9*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren and Agent in 1858.
51. Committees: 1857, 29th April, 10th July. 1858, 22nd July. Agent: 1857, inspection prevented by illness. 1858, 22nd March.
52. No.
53. Five lamps, with burners complete; in the old light tower. Diameter of oil room, 15 feet 2 inches; height of ditto, 7 feet 4 inches.
54. Aneroid barom eter with thermometer attached; internal thermometer.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

82.

ST. BEES.

St. Bees Head, Entrance to the Harbour of Whitehaven.

3. B. H. Bailey, Milford, Pembrokeshire.
4. One.
5. May 1717.
6. Trade to and from Whitehaven, Parton, and Workington. See Lighthouses General Return, 19.
7. Nearest projecting headland to Whitehaven.
8. 1718 as a coal fire; rebuilt 1822. 1st January 1823 as an oil light, from present lighthouse.
9. Builder and Engineer, Joseph Nelson. Not by contract.
10. Sea light.
11. Red sandstone; solid walls, at base 8 feet, at top 2 feet; coated with cement; white; four-sided or square; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 49 feet.
14. 333 feet.
15. 19½ miles.
16. 25 miles.
17. 248°. S. 34 E.; N. 34 E.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 15 burners.
23. None.
24. Robert Wilkins and Son, London.
25. Faraday's tubes, 13 in. diameter over the flames of the lamps, and by air tubes under lantern floor.
26. None.
27. None.
28. 17 days.
29. New tower and alterations, 1823, 1,447*l.* 5*s.* 4*d.* Dwellings, 1840, 460*l.* 5*s.* 5*d.*
30. Completed.
31. Diameter, 12 feet. Height: pedestal, 4 feet 3 inches; glass, 5 feet 9 inches; glass to vane, 12 feet 6 inches; total, 22 feet 6 inches. 367*l.* 18*s.* 2*d.*
32. Not purchased. Lease expired, Michaelmas 1817.
33. 19*l.* 6*s.* since 1822.
34. 18*l.* 7*s.* 7*d.*; not by contract; once in four years.
35. Two; one at 65*l.* per annum, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Not known. Alterations in 1822, 435*l.* 15*s.*
37. 1857, 8*l.* 15*s.* 5*d.* 1858, 9*l.* 12*s.* 7*d.*
38. 1857, oil, 614 gallons; wicks, 80 dozen. 1858, oil, 614 gallons; wicks, 81 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 16*s.* 8*d.* 1858, 16*s.* 10*½d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 195*l.* 1*s.* 2*d.* 1858, 179*l.* 11*s.* 8*d.* Total for 1852, 598*l.* 8*s.* 10*d.*
44. 1852, 258*l.* 4*s.* 3*d.* 1858, 249*l.* 14*s.* 10*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committees of the Elder Brethren, and by Agent 1858.
51. Committees: 1857, 30th April, 1858, 23rd July. Agent: 1857, inspections prevented by illness. 1858, 18th March.
52. No.
53. Three lamps with burners complete. In the basement of tower; diameter of oil store, 12 feet; height of ditto, 11 feet 4 inches.
54. Barometer, with thermometer attached; internal and external thermometers.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CORPORATION OF TRINITY HOUSE, LONDON.

83.

HELIGOLAND.

The Highest Part of the Island.

3. Henry Gätke, Heligoland.
4. One.
5. Not known.
6. Not known.
7. To mark the Island and the entrance to the Elbe.
8. Not known. Rebuilt by order of Government 1810-11, and first exhibited as an oil light, February 1811.
9. Builders, Messrs. Jolliffe and Banks. Engineer, Daniel Alexander. By contract.
10. Sea light.
11. Stone; inner and outer wall, but wall of watchroom solid. Inner wall, 1 foot $1\frac{1}{2}$ inch; vacuity, 3 inches; outer wall, 1 foot $1\frac{1}{2}$ inch; at base, 2 feet 6 inches. Inner wall, $8\frac{1}{2}$ inches; vacuity, $9\frac{1}{2}$ inches; outer wall, $8\frac{1}{2}$ inches; at top, 2 feet $2\frac{1}{2}$ inches. Not coated; white; circular; lantern gallery with iron railing.
12. Dr. Faraday's.
13. 75 feet.
14. 258 feet.
15. 17 miles.
16. 20 miles.
17. 960°. The whole circle.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors 21 inches diameter, 9 inches deep.
22. 24 burners.
23. None.
24. Reflectors and frame, G. Robinson, London. Lamps, &c., R. Wilkins and Son, London.
25. Faraday's tubes, $1\frac{1}{2}$ inch diameter over flames of the lamps, also by openings in the pedestal of the lantern, and by door leading to gallery.
26. None.
27. None.
28. 44 days.
29. Lighthouse and dwellings, 8,618*l.* 14*s.* 7*d.*
30. Completed.
31. Diameter, 13 feet. Height; pedestal, 3 feet 9 inches; glass, 8 feet; glass to vane, 13 feet 3 inches; total, 25 feet. Price, including apparatus and fitting, 4,320*l.* 5*s.* 9*d.*
32. Not purchased. Vested in the Trinity House in the year 1836.
33. 2*l.* 5*s.* since 1822.
34. 7*l.* 9*s.* 6*d.*; not by contract, every other year.
35. Two; one at 65*l.*, one at 45*l.* per annum, a suit of clothes annually, and coal, oil, and furniture for dwellings.
36. Included in price of lantern.
37. 1857, 28*l.* 8*s.* 6*d.* 1858, 7*l.* 9*s.* 5*d.*
38. 1857, oil, 865 gallons; wicks, 149 dozen. 1858, oil, 870 gallons; wicks, 140 dozen.
39. See Lighthouses, General Return, 19.
40. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 11*s.* 0*½d.* 1858, 1*l.* 9*s.* 2*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 1,125*l.* 6*s.* 3*d.* 1858, 1,093*l.* 14*s.* 3*d.* Total for 1852, 3,755*l.* 14*s.* 6*d.*
44. 1852, 390*l.* 6*s.* 3*d.* 1858, 382*l.* 10*s.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. Committee of the Elder Brethren in 1857, Agent in 1857 and 1858.
51. Committee: 1857, 19th August. Agent: 1857 and 1858, inspected two or three times during every month. Dates have not been recorded.
52. No.
53. 24 lamps, with burners complete; in the basement of lighthouse. Diameter of cellar, 13 feet; height of ditto, 10 feet 6 inches.
54. Barometer, with thermometer attached; external and internal thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

84.

GIBRALTAR.

Extreme of Europa Point.

3. John Terry, Gibraltar.
4. One light.
5. Not known.
6. Not known.
7. Selected by Government.
8. 1st August 1841.
9. Built by Corps of Royal Engineers.
10. Sea light.
11. Limestone; solid wall, at base 5 feet, at top 2 feet 6 inches; not coated; limestone colour; open gallery with flagstaff on gallery railing.
12. Dr. Faraday's.
13. 91 feet.
14. 166 feet.
15. 133 miles.
16. 15 miles.
17. 252°. N. 48 E., N. 60 W.
18. Fixed; bright.
19. Not revolving.
20. See Lighthouses, General Return, 19.
21. Dioptric. 8 refractors of 10 to the circle, and 2 spherical reflectors, with 7 upper and 4 lower tiers of concave mirrors. Fountain, 4 concentric wick lamp, with regulating condenser.
22. 1st order.
23. None.
24. Optical parts, Isaac Cookson and Co., Newcastle. Frame, reflectors, lamps, &c., R. Wilkins and Son, London.
25. Faraday's tube, 4½ inches diameter over the flame of the lamp, and by air openings under lantern floor through tubes from the outside.
26. None.
27. None.
28. 6 days.
29. Not known.
30. Completed.
31. Diameter, 14 feet. Height; pedestal, 7 feet; glass, 10 feet; glass to vane, 9 feet; total, 26 feet. Price not known.
32. Not purchased; vested in Trinity House by Act 1 & 2 Vict. c. 66.
33. 54*l.* 7*s.* 7*d.*, including painting. Contract each year for works required.
34. Included in cost of repairs.
35. Two; one at 65*l.*, one at 46*l.* 10*s.* per annum, a suit of clothes annually, with oil and furniture for dwellings and 88 dollars, or 18*l.* 6*s.* 8*d.* sterling, each keeper for coal and fuel, per annum.
36. Not known.
37. 1857, 17*l.* 6*s.* 11*d.* 1858, 19*l.* 10*s.*
38. 1857, oil, 358 gallons; wicks, 38 yards. 1858, oil, 355 gallons; wicks, 37 yards.
39. See Lighthouses, General Return, 19.
40. Concentric cotton, 7½*d.* per yard. 1857, 1*l.* 3*s.* 9*d.* 1858, 1*l.* 3*s.* 1½*d.*
41. Nil.
42. See Lighthouses, General Return, 19.
43. 1852, 135*l.* 0*s.* 9*d.* 1858, 139*l.* 6*s.* 11*d.* Total for 1852, 606*l.* 8*s.* 4*d.*
44. 1852, 245*l.* 4*s.* 2*d.* 1858, 288*l.* 17*s.* 2*d.* See Lighthouses, General Return, 19.
- 45, 46, 47. Nil. See Lighthouses, General Return, 19.
48. Nil.
49. Nil.
50. By local agent.
51. 1857, 25th February; 23rd April; 8th, 15th, 30th May; 17th June; 18th July; 19th August; 11th September; 7th October; 12th November; 11th December. 1858, 8th March; 5th, 30th April; 31st May; 9th July; 12th August; 24th September; 28th October; 1st November; 1st December.
52. No.
53. 5 lamps, 1 reservoir, 1 overflow or receiver, 1 refractor, 30 mirrors. In an outbuilding in front of the dwellings, 66 feet west of the tower. Length of oil cellar, 19 feet; breadth, 8 feet; height, 8½ feet.
54. Barometer, with thermometer attached; external and internal thermometers and compass.
55. See Lighthouses, General Return, 19.
56. Ditto, ditto.
57. Not relieved.

CIRCULAR No. II.—FLOATING LIGHTS.—GENERAL RETURN.

I. The Corporation of Trinity House of Deptford Strond, Trinity House, London, E.C.

II. List of floating lights under the superintendance of the Trinity House:—

1. Spurn.
2. Dudgeon.
3. Lynn Well.
4. Leman and Ower.
5. Haisbro'.
6. Newarp.
7. Cockle.
8. St. Nicholas Gatt.
9. Stanford.
10. Shipwash.
11. Sunk.
12. Galloper.
13. Cork.
14. Kentish Knock.
15. Swin Middle.
16. Mouse.
17. Nore.
18. Tongue.
19. Prince's Channel.
20. Girdler.
21. Goodwin.
22. Gull.
23. South Sand Head.
- * 24. Owers.
25. Calshot.
26. Warner.
27. Bembridge.
28. Shambles.
29. Seven Stones.
30. English and Welsh Grounds.
31. Helwicks.
32. Cardigan Bay.
33. Bahama Bank.

III. If to mark dangers, as near to them as the light can be safely placed. If as leading lights, dependent on the character of the channel.

IV. Four; two at Blackwall, one at Yarmouth, one at Milford (at present lent to Admiralty for marking Holyhead breakwater). A shipkeeper in charge, but always a sufficient number of men on shore from the other vessels to form an available crew if required. The spare vessels are partially stored, and can be sent to sea within a few hours.

V. Name written on side; variation in the number and character of the lights; red colour; globe at each masthead.

VI. In the case of fixed lights, greater brilliancy; in others, by a revolving character. Two of the floating lights show an additional light of a red colour.

VII. Catoptric and dioptric.

VIII. The catoptric principle is found most suitable for lightvessels.

IX. Fixed; revolving.

X. Dependent on lights in vicinity.

XI. See below.—TABLE OF PRICES.

	Price	-	Fixed.	351 <i>l</i> .
Catoptric.	Ordinary repairs	-	10 <i>l</i> .	5 <i>s</i> . 4 <i>d</i> .
	Oil	{ Consumption-	6 galls.	3 qts. 0½ pts.
8 Burners.		{ Cost	-	1 <i>l</i> . 2 <i>s</i> . 8¾ <i>d</i> .
	Wicks	{ Consumption-	2 doz.	1½.
		{ Cost	-	5¾ <i>d</i> .
Catoptric.	Price	-	Revolving.	398 <i>l</i> . 10 <i>s</i> .
	Ordinary repairs	-	7 <i>l</i> .	13 <i>s</i> . 10 <i>d</i> .
4 Burners.	Oil	{ Consumption-	3 galls.	1 qt. 0¾ pt.
		{ Cost	-	11 <i>s</i> . 1¾ <i>d</i> .
	Wicks	{ Consumption-	1 doz.	4.
		{ Cost	-	3¾ <i>d</i> .
Dioptric.	Price	-	Fixed.	217 <i>l</i> .
	Ordinary repairs	-	Not known.	
5th Order.	Oil	{ Consumption-	1 gall.	3 qts. 1 pt.
		{ Cost	-	6 <i>s</i> . 3 <i>d</i> .
	Wicks	{ Consumption-	1 foot.	
		{ Cost	-	1½ <i>d</i> .

XII. Attached; one sheet showing apparatus, lantern, and revolving machinery, and one sheet showing fifth order dioptric.

XIII. Gongs are in use at all the lightvessels.

XIV. Not in use.

* Since these returns were prepared the Trinity House have placed a Light Vessel to mark the Varne Shoal, first exhibited on the 1st October, 1860.

XV.

XV. Nature and date of any applications for floating lights since 1st January 1845; nature and date of replies:—

STATIONS IN ENGLAND AND WALES.

1846.

Bahama Bank.

December.—R. L'Amont, Esq., that trade are desirous of having light thereat.

1847, January.—R. L'Amont, Esq., transmitting memorial from trade.

Complied with; lightvessel placed.

1850.

Princes Channel.

April.—J. R. Ward, Esq., recommending light between Tongue and Girdler.

Acquainted that Corporation have no present intention of placing light.

Light subsequently found desirable and placed.

1855.

Cardigan Bay.

February.—J. R. Ward, in a letter to an Elder Brother, on behalf of Port Madoc Committee of Royal National Society for Preservation of Life from Shipwreck, representing advantage which would be derived from light on Causeway running across Cardigan Bay.

Read.

April.—Shipowners and others requesting light on Sarn Badrig.

Visiting Committee to inspect locality.

1858, December.—Board of Trade, with memorial from Liverpool Underwriters' Association, for an additional light in Cardigan Bay.

Vessel has been built and light was shown on 1st July 1860.

Fairway Light, St. George's Channel.

September.—Board of Trade transmit resolution of Shipowners' Association, Liverpool, "That this meeting is of opinion that if such a light (Mr. Herbert's patent) can be securely and permanently established in such a position it would be very advantageous to shipping passing up and down St. George's Channel."

Elder Brethren are prepared to admit that a light placed in the Fairway of any frequented channel might be found useful as an adjunct to those by which the local dangers are marked, and offer no objection to improvement, provided a light could be securely and permanently kept in its proper place; but they fear that a vessel of that construction so placed would be liable to break adrift or be driven from her moorings, and that disastrous consequences might in such case ensue.

1859, September.—Board of Trade transmit letter from Mr. Lindsay, M.P., with enclosure from Liverpool, renewing proposal to place a light on Mr. Herbert's patent between the Tuskar and the Smalls.

Trinity House advert to previous reply, and having regard to recent improvements in lighting that channel, retain opinion that proposition is neither required nor judicious.

1857.

Scroby Sand and Stanford Channel.

November.—Mr. G. Simeson, recommending a lightship on the inner corner of the Scroby and another in the Stanford Channel.

Acquainted that his communication has been laid before the Board.

1859.

Cardarthen.

April.—Mr. Thomas, Esq., Kidwelly, proposing a lightvessel or bell buoy for Cefn Sidon Sands.

Acquainted that we have subject under consideration. (See Return for Buoys and Beacons.)

ENGLAND.
Circular II.

XV. to XIX.

FLOATING LIGHTS.—GENERAL RETURN.

XIX.

Telegraph Station at Entrance of English Channel.

December.—Board of Trade transmitting copy of a memorial from merchants and others for a floating fairway light and telegraph station in entrance of English Channel.

Elder Brethren are not in possession of information to enable them to judge of feasibility.

Board of Trade request opinion whether, supposing scheme to be practicable, Elder Brethren consider light would be of value as a sea mark.

Trinity House decline to express an opinion upon question of so entirely hypothetical a nature, more especially as it might influence statutory assent or dissent if required in the event of subject assuming more substantial form.

Board of Trade point out various features connected with proposal, and request opinion of Elder Brethren as to its use as a sea mark.

Supposing stability and permanence to be established, Elder Brethren do not consider any important benefit would be derived, but that entertaining strong doubts of permanence, consider it would be worse than no light at all.

STATIONS IN IRELAND.

1856.

Blackwater Bank.

February.—Alderman Greene, Wexford, recommending light thereon.

April.—Board of Trade, forwarding correspondence with Irish Board, and requesting to be informed if light is necessary; and if so, whether one of Mr. Herbert's vessels might not be tried there.

Trinity House consider that light may be advantageous, but cannot recommend a vessel on Mr. Herbert's plan in a situation not under immediate observation from shore.

June.—Board of Trade, submitting observations from Irish Board on relative advantages of a floating light and a lighthouse on Cahore Point. Elder Brethren consider a floating light the safer guide.

July.—Board of Trade concur that floating light is preferable, and have instructed Irish Board to take the usual course.

1857. March.—Irish Board, proposing exact position and character.

Trinity House concur with Captain Roberts, that station should be outside the bank, midway between Arklow and Tuskar. Two lights, one revolving, the other fixed; the revolving one 12 or 14 feet higher, but not on the same mast.

1859, June.—Trinity House propose to alter character to a single fixed bright light, to avoid possibility of mistake with Tuskar. Arklow to be a single quick revolving bright light, and Cardigan Bay a single quick revolving red light.

STATIONS IN CHANNEL ISLANDS.

1858.

Guernsey.

June.—Messrs. Harvey, Hayle, offering to moor and maintain a lightvessel on Herbert's plan for reasonable period, and if found not to answer, to build an iron lighthouse for 15,500*l*.

Acquainted that there is no intention of placing a lightvessel thereat.

XVI. Total income for lighthouses, floating lights, buoys and beacons, and total expenditure on maintenance of floating lights in each year since 1st January 1845:—

	Total Income.	Expenditure for Lightvessels.
1845	£319,325 19 9½	£24,251 19 3
1846	305,363 12 9	27,009 17 5
1847	333,142 5 5	33,211 5 11
1848	341,014 1 4	44,842 5 6
1849	323,429 9 8½	41,216 19 2
1850	271,507 19 84	50,249 12 7
1851	290,986 13 11	46,343 16 10
1852	286,961 18 8	31,430 18 10
1853	292,856 10 5	34,319 10 7
1854	236,172 19 6	36,241 15 4
1855	253,497 3 5	39,229 19 11
1856	304,648 11 9	37,810 4 7
1857	267,624 10 0	40,491 0 3
1858	255,122 13 3	38,235 16 8

Income.

For the years preceding 1855, the amounts stated are the total of light duties collected for English Lights. Subsequent years show the totals collected at English ports.

XVII. Considered by Board; referred to Mr. Faraday; tried at the Trinity House or at Blackwall, and, if desirable, at a station.

XVIII. Attached. See also Instructions to Agents sent with Lighthouses General Return.

XIX. Dates of all applications for power to place floating lights in new positions since 1st October 1853, with date of final approval, and in case of non-compliance, the reason given for any deviation from the application:—

1856.

Prince's Channel.

February.—Requesting sanction for expense of lightvessel therein.

February.—Board of Trade sanction.

1858.

Shambles.

December.—Requesting sanction for expense of lightvessel.

1859, January.—Board of Trade sanction, but consider one of the Portland lights might be put out.

1859.

Cardigan Bay.

March.—Requesting sanction for expense of lightvessel.

Board of Trade sanction; subsequently demur to period of revolution, "of which whole responsibility rests with Trinity House."

1860.

Yarne.

January.—Requesting sanction for expense of lightvessel.

Board of Trade request more detailed information as to position, &c.

February.—Sanction given.

XX. Answers to Questions of a general character in the Special Returns.—(See Circular IV. for the Questions to which the following are Replies).—

3. The Corporation of Trinity House of Deptford Strond, Trinity House, London, E.C.

5. As a general rule, whenever it appeared desirable to the Elder Brethren to exhibit a new light it was the practice of the Corporation (previous to October 1853) to ascertain the views of parties likely to be affected thereby, who then signified their willingness to pay the toll requisite for its maintenance by memorializing the Board to establish a light in the locality.

26. From sunseting to sunrise.

31. Lanterns round masts, suspended by lantern tyes, lamps gimbed and balanced.

36. In this sum are included the costs of the lanterns and apparatus, the moorings, and all fittings.

37. Ordinary repairs are usually effected at the station by local tradesmen. No lightvessel is kept in repair by periodical contract. Extraordinary repairs are generally done in London, the Newarp, Seven Stones, Bahama Bank, and others have been sometimes repaired at the out-ports.

39. The difference in the wages of the seamen arises from the fact of the men who have entered since October 1853 not being entitled to pensions for their widows, in lieu of which they have been required to insure their lives, by payment of 5*s*. per month, their wages being increased 2*s*. 6*d*. to assist them in so doing.

41. The master is allowed 1*s*. 6*d*. per man per day for victualling, according to scale annexed, and has to allow the men 1*s*. 3*d*. each per day when they are on shore.

42. The amount stated is that which the present moorings would cost complete at the prices of 1858, and includes both the moorings in use and the anchors and cables in reserve.

XX.

FLOATING LIGHTS.—GENERAL RETURN.

44. The sum stated includes glass cylinders, wear and tear, and cleaning stores consumed.

49. From revenues derivable from dues for lights, buoys, and beacons, paid into the Paymaster-General's Office to the account of the Mercantile Marine Fund; but the Admiralty, by an annual payment, uphold the "Warner."

51. The amount stated for 1852 differs from that shown in the Parliamentary Return for that year, as the latter included the cost of collection (now defrayed by the Custom House), and a proportion of the expense of the steam or sailing tender by which each light was served, &c. The whole sum disbursed on the lightvessels in each year is given. The expenditure varies according to damage sustained, general repairs undergone, or lapse of time since the last general repairs.

52, 53, 54. See Return in Lighthouses General Return, to 45, 46, 47, Lighthouses Special Returns.

63. By signals of guns and rockets. Each vessel is fitted with two carronades, and is also supplied with a buoy and coir hawser, for the purpose of veering to any boat in distress.

64. See day signal code sent with Lighthouses, see also answer to XVIII., Floating Lights, General Return, "Additional Instructions, &c."

The Gull lightvessel has a special signal for life boats.

65. Not considered necessary.

XX.

ENGLAND.
Circular II.

Scale of Victualling referred to at XX., 41.

Ordered,—That the under-mentioned rations, when afloat, and money in lieu thereof when on shore, be allowed to the crew of each lightvessel belonging to this Corporation, viz. :—

When afloat,		
Meat	-	10 lb. per week each man.
Bread	-	7 lb. ditto.
Flour	-	2 lb. ditto.
Peas	-	1 pint. ditto.
Potatoes	-	7 lb. ditto.
Suet	-	$\frac{1}{2}$ lb. ditto.
Tea	-	2 oz. ditto.
Sugar	-	$\frac{3}{4}$ lb. ditto.
Beer	-	3 gallons ditto.

When on shore, one shilling and threepence per day each man, in money, in lieu of provisions.

Ordered,—That a copy hereof be fixed up in the cabin and galley of each lightvessel.

Ordered also,—That no provisions whatever be removed from the vessel.

By order of the Board.

Trinity House, London,
1st January 1845.

CIRCULAR No. IV.—FLOATING LIGHTS.—SPECIAL RETURNS.

CORPORATION OF TRINITY HOUSE, LONDON.

The Lights are numbered to correspond with the Index Map.

1.

SPURN.

Off the Point at the Entrance of the Humber.

2. 10 fathoms; coarse sand; 4 knots.
 4. William Davie, Great Yarmouth.
 5. April 1819. Trade of Hull and ports on the north-east coast. See Floating Lights, General Return, 20.
 6. To mark the entrance to the Humber and clear adjacent shoals.
 7. Since 27th March 1820.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 163 tons.
 12. Blackwall; William Pitcher.
 13. About 8 feet aft, 7 feet 4 inches forward.
 14. Red.
 15. A red ball at the masthead; name on the sides of the vessel.
 16. One mast 69 feet long; one lugsail; one staysail.
 17. Wire rod above the masthead connected by metal plates to chain rigging and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor ground tackle, two bower anchors, 135 fathoms chain.
 19. Patent proved short-linked chain $1\frac{1}{2}$ inch iron. Mushroom anchor, 32 cwt.; one bower anchor, 20 cwt., one ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 38 feet.
 22. 6 $\frac{1}{2}$ miles.
 23. 10 miles.
 24. Revolving; bright.
 25. Once in two minutes, showing a flash every thirty seconds.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine.
 28. Four burners.
 29. None.
 30. William Wilkins and Company, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 19 days.
 34. 19 days.
 35. „100l. 3s.
 36. 4,297l. 0s. 3d.
 37. 7,1. 8s. No extraordinary expenditure.
 38. 11.
- | | £ | s. | d. | |
|-----------------|-----|----|----|---|
| 39. 1 master | - 5 | 0 | 0 | per mon.; 1 suit uniform: 20l. per ann. house rent. |
| 1 mate | - 4 | 0 | 0 | „ |
| 3 lamp-lighters | - 2 | 12 | 0 | „ |
| 1 carpenter | - 2 | 17 | 0 | „ |
| 5 seamen | - 2 | 7 | 0 | „ |
- At present an allowance of 10 per cent. additional on wages.
40. 301l. 2s. 6d., victualling allowance.
 41. 1s. 6d. per day per man. See Floating Lights, General Return, 20.
 42. 5,451. 8s. 4d.
 43. 3,994. 15s. 11d., including revolving apparatus.
 44. 1,857. 8l. 8s. 11d.; 1,858. 8l. 8s. 9d.
 45. 1,857. oil, 176 gallons; wicks, 60 dozen. 1858. oil, 176 gallons; wicks, 76 dozen.
 46. Rapeseed oil, 1,857. 4s. per gallon, 35l. 4s. 1858. 3s. 3d. per gallon, 28l. 12s.
 47. Argand cotton, 2s. 6d. per gross. 1857. 12s. 6d. 1858. 15s. 7 $\frac{1}{2}$ d. 48. 2l. 13s.
 49. See Floating Lights, General Return, 20.
 50. Midsummer quarter, 1852, 6,931. 10s. 8d. Ditto, 1858. 3,471. 5s. 2d. Total for 1852, 2,410l. 17s. 33d.
 51. 1,852. 808l. 12s. 12. 1858. 867l. 15s. 6d. See Floating Lights, General Return, 20.
 52. 53, 54. Nil. See Floating Lights, General Return, 20.
 55. 56, 57. Nil.
 58. By Committees of the Elder Brethren and Assistant Agent in charge of the monthly reliefs.
 59. At the times of effecting the reliefs.
 60. 61. No.
 62. An aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men are on shore in rotation. Relieved by steam vessel.
 67. By steam vessel from Yarmouth once a month.
 68. Yes, at Yarmouth; as soon as she could be towed to the station.

2.

DUDGEON (or WELL),

Near the Shoal.

2. 10 fathoms; stones; 3 knots.
 4. William Davie, Great Yarmouth.
 5. September 1734. David Avery and principal merchants, owners, and commanders of vessels using the northern and eastern navigation. See Floating Lights, General Return, 20.
 6. To 1. ad inside the Dudgeon, and mark the shoal.
 7. Since about June 1736.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 1,45 $\frac{1}{2}$ tons.
 12. Blackwall; Green, Wigrams, and Green.
 13. Forward, 7 feet; aft, 8 feet.
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. One mast 69 feet long; one lugsail; one staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 225 fathoms of riding chain to a mushroom anchor. Ground tackle, 2 bower anchors, 105 fathoms chain.
 19. Patent proved short-linked chain, $1\frac{1}{2}$ inch iron. Mushroom anchor, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Company, Millwall.
 21. 38 feet.
 22. 6 $\frac{1}{2}$ miles.
 23. 10 miles.
 24. Fixed; bright.
 25. Not revolving.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors of 12 inches diameter.
 28. Eight burners.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 18 days.
 34. 18 days.
 35. 2,251. 0s. 3d.
 36. 3,297l. 2s. 11d.
 37. 63l. 0s. 2d. 1852-3, general repairs, 1,554l. 2s. 6d.
 38. 11.
- | | £ | s. | d. | |
|-----------------|-----|----|----|---|
| 39. 1 master | - 5 | 0 | 0 | per mon.; 1 suit uniform: 20l. per aon. house rent. |
| 1 mate | - 4 | 0 | 0 | „ |
| 3 lamp-lighters | - 2 | 12 | 0 | „ |
| 1 carpenter | - 2 | 17 | 0 | „ |
| 5 seamen | - 2 | 7 | 0 | „ |
- At present an allowance of 10 per cent. additional on wages.
40. 301l. 2s. 6d., victualling allowance.
 41. 1s. 6d. per day per man. See Floating Lights, General Return, 20.
 42. 5,251. 16s. 3d.
 43. 7,211. 15s. 3d.
 44. 1,857. 10l. 14s. 10d. 1858. 14l. 18s. 10d.
 45. 1,857. oil, 275 gallons; wicks, 119 dozen. 1858. oil, 288 gallons; wicks, 129 dozen.
 46. Rapeseed. 1,857. imperial gallon, 9lb., at 4s. per gallon, 55l. 1858, ditto, at 3s. 3d. per gallon, 40l. 16s.
 47. Argand cotton at 2s. 6d. per gross. 1857. 1l. 4s. 9 $\frac{1}{2}$ d. 1858. 1l. 6s. 10 $\frac{1}{2}$ d.
 48. 2l. 13s.
 49. See Floating Lights, General Return, 20.
 50. Midsummer quarter, 1852, 1,101. 4s. 11 $\frac{1}{2}$ d. Ditto, 1858, 784l. 3s. 11d. Income for 1852, 4,090l. 14s. 4d.
 51. 1,852. 2,464l. 6s. 5d. 1858, 917l. 2s. 6d. See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of Elder Brethren and by Assistant Agent in charge of monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
 67. By steam vessel from Great Yarmouth once a month.
 68. Yes, at Yarmouth; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

3.

LYNN WELL.

Off the Hook of the Long Sand, Lynn
Deeps.

2. 26 fathoms; rough stones; 4 knots.
4. William Davie, Great Yarmouth.
5. January 1847. The trade of Lynn, Yarmouth, and neighbouring ports. See Floating Lights, General Return, 20.
6. The best position for safety of navigation to port of Lynn.
7. Since 22nd February 1828.
8. Two, horizontal.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 163 $\frac{1}{2}$ tons.
12. Blackwall; William Pitcher.
13. Forward, 6 feet 6 inches; aft, 7 feet 6 inches.
14. Red.
15. Red ball at each masthead. Name on the sides of the vessel.
16. Two masts, one 69 feet, one 60 feet; one fore lugsail, one main lugsail, one fore staysail, one main staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 150 fathoms chain.
19. Patent proved short-linked chain, $\frac{1}{2}$ inch iron. Mushroom anchor, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 15 cwt.
20. Brown, Lenox, and Co., Millwall.
21. 34 feet.
22. 61 miles.
23. 10 miles.
24. Fixed; bright.
25. Both stationary.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors of 12 inches diameter.
28. 16 burners, 8 in each lantern.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 20 days.
34. 22 days.
35. 3,128*l.* 8*s.*
36. 4,299*l.* 15*s.* 5*d.*
37. 5*l.* 6*s.* 2*d.* 1856, general repair, 2,468*l.* 17*s.* 7*d.*
38. 11.
39. 1 master £ s. d.
 - 5 0 0 per mon.: 1 suit uniform: 20*l.* per ann. house rent.
1 mate - 4 0 0 " " { At present an allowance of
3 lamplighters 2 12 0 " " { 10 per cent.
1 carpenter 2 17 0 " " { additional on
4 seamen 2 7 0 " " { wages.
1 " - 2 9 6 " " {
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 566*l.* 8*s.*
43. 943*l.* 2*s.* 10*d.*
44. 1857, 16*l.* 12*s.* 1858, 17*l.* 18*s.* 5*d.*
45. 1858, oil, 556 gallons; wicks, 131 dozen. 1858, oil, 550 gallons; wicks, 137 dozen.
46. Rapeseed. 1857, imperial gallon, 9*lbs.* at 4*s.*, 111*l.* 4*s.* 1858, ditto, at 3*s.* 3*d.*, 89*l.* 7*s.* 6*d.*
47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 1*l.* 7*s.* 3 $\frac{1}{2}$ *d.* 1858, 1*l.* 8*s.* 6 $\frac{1}{2}$ *d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 300*l.* 8*s.* 4*d.* 1858, ditto, 119*l.* 8*s.* 7*d.* Total income, 1852, 1,009*l.* 10*s.* 8 $\frac{1}{2}$ *d.*
51. 1852, 1,007*l.* 12*s.* 7*d.* 1858, 92*l.* 9*s.* 7*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57, Nil.
58. By Committees of the Elder Brethren and by Assistant Agent in charge of monthly reliefs.
59. At the time of effecting the monthly reliefs.
- 60, 61. No.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
67. By steam vessel from Great Yarmouth once a month.
68. Yes, at Great Yarmouth; as soon as she could be towed to the station

4.

LEMAN AND OWER.

Between the Leman and Ower Sand, and
near to the latter.

2. 17 fathoms; coarse sand; 2 $\frac{1}{2}$ knots.
4. William Davie, Great Yarmouth.
5. December 1838. General Shipowners' Society and trade of ports generally on the east coast and in the English Channel; renewed April 1839 by the Baltic and Hambro' trade. See Floating Lights, General Return, 20.
6. To guard the Leman and Ower Sands.
7. Since 1st January 1840.
8. Two, unequal heights.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 158 $\frac{1}{2}$ tons.
12. Blackwall; Green, Wigrams, and Green.
13. Forward, 7 feet; aft, 8 feet 6 inches.
14. Red.
15. Red ball at each masthead. Name on the sides of the vessel.
16. Fitted with two masts, one 69 feet, one 60 feet; one lugsail, one fore staysail, 1 main staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms of riding chain to a mushroom anchor. Ground tackle, 2 bower anchors and 135 fathoms chain.
19. Patent proved short-linked chain, $\frac{1}{2}$ inch iron. Mushroom anchor, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. Upper, 38 feet; lower, 27 feet.
22. Upper, 65 miles; lower, 5 $\frac{1}{2}$ miles.
23. 10 miles.
24. Upper, revolving; bright. Lower, fixed; bright.
25. Upper, once in four minutes; showing a flash every minute. Lower, not revolving.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine for light.
28. 12 burners; upper 4, lower 8.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 17 days.
34. 22 days.
35. 2,253*l.* 0*s.* 3*d.*
36. 3,474*l.* 15*s.* 9 $\frac{1}{2}$ *d.*
37. 95*l.* 5*s.* 5*d.* 1852, general repair, 1,400*l.* 8*s.* 9*d.*
38. 11.
39. 1 master £ s. d.
 - 5 0 0 per mon.: 1 suit uniform: 20*l.* per ann. house rent.
1 mate - 4 0 0 " " { At present an allowance of
3 lamplighters 2 12 0 " " { 10 per cent.
1 carpenter 2 17 0 " " { additional on
3 seamen 2 7 0 " " { wages.
2 " - 2 9 6 " " {
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man. See Floating Lights, General Return, 20.
42. 545*l.* 8*s.* 8*d.*
43. 1,204*l.* 7*s.* 8*d.*, including revolving apparatus.
44. 1857, 19*l.* 4*s.* 9*d.* 1858, 18*l.* 2*s.*
45. 1857, oil, 428 gallons; wicks, 148 dozen. 1858, oil, 320 gallons; wicks, 156 dozen.
46. Rapeseed. 1857, imperial gallon, 9*lbs.* at 4*s.*, 85*l.* 12*s.* 1858, ditto, at 3*s.* 3*d.*, 63*l.* 7*s.* 6*d.*
47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 1*l.* 10*s.* 10*d.* 1858, 1*l.* 12*s.* 6*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 300*l.* 8*s.* 4*d.* 1858, ditto, 791*l.* 16*s.* 10*d.* Total income for 1852, 4,017*l.* 5*s.* 10*d.*
51. 1852, 3,215*l.* 4*s.* 2*d.* 1858, 1,206*l.* 4*s.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57, Nil.
58. By Committees of Elder Brethren and by Assistant Agent in charge of monthly reliefs.
59. At the time of effecting the monthly reliefs.
60. 1858, 1st to 5th February, chain parted, and position of vessel made it necessary to extinguish the lights. Light extinguished during the nights of the 1st, 2nd, 3rd, and 4th February.
61. 1849, 29th to 31st December, chain parted, nearly 2 $\frac{1}{2}$ days. 1858, 1st to 5th February, ditto, 4 days.
62. Aneroid barometer, and thermometer attached, and three compasses.
- 63, 64, 55. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
67. By steam vessel from Great Yarmouth once a month.
68. Yes, at Great Yarmouth; as soon as she can be towed to the station.

5.

HAISBRO'.

Near the North End of the Sand.

2. 15½ fathoms; rocky; three knots.
 4. William Davie, Great Yarmouth.
 5. November 1830. Trade of London and Newcastle and ports generally on the east coast of England and Scotland, and Ship-owners Societies of Hull, Newcastle, and Sunderland. See Floating Lights, General Return, 20.
 6. To mark N.W. end of Haisbro' Sand, and entrance to the Wold.
 7. Since 1st January 1832.
 8. Two; horizontal.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 158½ tons.
 12. Northfleet; William Pitcher.
 13. Forward, 7 feet; aft, 8 feet 2 inches.
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. Two masts, one 69 feet, one 60 feet; one lugsail, one fore stay-sail, one main stay-sail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 135 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Mushroom, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Fixed; bright.
 25. Both stationary.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 16 burners; 8 in each lantern.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 20 days.
 34. 22 days.
 35. 2,97*sd.* 2*s.* 6*d.*
 36. 3,74*sd.* 13*s.* 1*d.*
 37. 95*l.* 18*s.* 5*d.* 1856, general repair, 1,07*sd.* 13*s.* 1*d.*
 58. 11.
- | | | | | | |
|-----------------|---------|------------|------------------|-----------------------|--|
| 59. 1 master | - 5 0 0 | per mon. : | 1 suit uniform : | 20 <i>l.</i> per ann. | |
| | | | house rent. | | |
| 1 mate | - 4 0 0 | " | " | | { At present an allowance of 2 10 per cent. additional on wages. |
| 3 lamp-lighters | 2 12 0 | " | " | | |
| 1 carpenter | 2 17 0 | " | " | | |
| 4 seamen | 2 7 0 | " | " | | |
| 1 " " | 2 0 6 | " | " | | |
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 545*l.* 8*s.* 8*d.*
 43. 792*l.* 7*s.* 8*d.*
 44. 1857, 19*l.* 1*s.* 9*d.* 1858, 23*l.* 11*s.* 10*d.*
 45. 1857, oil, 555 gallons; wicks, 180 dozen. 1858, oil, 548 gallons; wicks, 214 dozen.
 46. Rapeseed. 1857, imp. gallon, 9 lbs., at 4*s.*, 111*l.* 1858, ditto, at 3*s.* 3*d.*, 89*l.* 1*s.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 1*l.* 17*s.* 6*d.* 1858, 2*l.* 6*s.* 8*d.*
 48. 2*l.* 13*s.*
 49. See Floating Lights, General Return, 20.
 50. Midsummer quarter, 1852, 1,054*l.* 1*s.* 10½*d.* Midsummer quarter, 1858, 717*l.* 0*s.* 1*d.* Total for 1852, 3,922*l.* 13*s.* 1½*d.*
 51. 1852, 1,041*l.* 5*s.* 1*d.* 1858, 1,151*l.* 5*s.* 10*d.* See Floating Lights, General Return, 20.
 52. 53, 54. Nil. See Floating Lights, General Return, 20.
 55. 56, 57. Nil.
 58. By Committees of Elder Brethren and Assistant Agent in charge of monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 60. No.
 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 63. 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
 67. By steam vessel from Great Yarmouth once a month.
 68. Yes, at Yarmouth; as soon as she could be towed to the station.

6.

NEWARP.

Near the North Point of the Sand.

2. 18 fathoms; coarse sand; four knots.
 4. William Davie, Great Yarmouth.
 5. Proposed 1724 and 1738. Applied for by the trade 1790. See Floating Lights, General Return, 20.
 6. To clear north end of Newarp Flat and the Cross Sand.
 7. Since November 1790. Moved, August 1802, three-fourths of a mile to the eastward.
 8. Three; triangular.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 158½ tons.
 12. Blackwall; M. Wigram and Sons.
 13. Forward, 7 feet; aft, 8 feet.
 14. Red.
 15. Red ball at each masthead. Name on the sides of the vessel.
 16. Three masts, one 69 feet, two 52 feet; two lugsails, one stay-sail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms of riding chain to a mushroom anchor. Ground tackle, two bower anchors and 150 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Mushroom, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. Upper, 36 feet; lower, 20 feet.
 22. Upper, 6½ miles; lower, 4½ miles.
 23. 10 miles.
 24. Fixed; bright.
 25. All stationary.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 24 burners.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 24 days.
 34. 24 days.
 35. 2,924*l.* 15*s.* 6*d.*
 36. 3,810*l.* 15*s.* 2*d.*
 37. 127*l.* 1*s.* 2*d.* (frequently damaged.) 1856, general repair, 1,07*sd.* 13*s.* 1*d.*
 58. 11.
- | | | | | | |
|-----------------|---------|------------|------------------|-----------------------|--|
| 59. 1 master | - 5 0 0 | per mon. : | 1 suit uniform : | 20 <i>l.</i> per ann. | |
| | | | house rent. | | |
| 1 mate | - 4 0 0 | " | " | | { At present an allowance of 10 per cent. additional on wages. |
| 3 lamp-lighters | 2 12 0 | " | " | | |
| 1 carpenter | 2 17 0 | " | " | | |
| 5 seamen | 2 7 0 | " | " | | |
| 1 " " | 2 0 6 | " | " | | |
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 569*l.* 8*s.*
 43. Two old lanterns and apparatus repaired, 362*l.* 14*s.* 10*d.* One new lantern and apparatus, 328*l.* 13*s.*
 44. 1857, 29*l.* 19*s.* 7*d.* 1858, 29*l.* 4*s.* 3*d.*
 45. 1857, oil, 892 gallons; wicks, 272 dozen. 1858, oil, 843 gallons; wicks, 228 dozen.
 46. Rapeseed. 1857, imp. gallon, 9 lbs., at 4*s.*, 178*l.* 8*s.* 1858, ditto, at 3*s.* 3*d.*, 136*l.* 19*s.* 9*d.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 2*s.* 16*s.* 8*d.* 1858, 2*l.* 7*s.* 6*d.*
 48. 2*l.* 13*s.*
 49. See Floating Lights, General Return, 20.
 50. Included in income of Haisbro' Lighthouses.
 51. 1852, 1,020*l.* 1*s.* 1*d.* 1858, 2,110*l.* 18*s.* 6*d.* See Floating Lights, General Return, 20.
 52. 53, 54. Nil. See Floating Lights, General Return, 20.
 55. 56, 57. Nil.
 58. By Committees of Elder Brethren and by Assistant Agent in charge of monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 60. No.
 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 63. 64, 65. See Floating Lights, General Return, 20.
 66. Once a month; the master or mate and six men are always on board. The master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
 67. By steam vessel from Great Yarmouth once a month.
 68. Yes, at Yarmouth; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

7.

COCKLE.

Eastern Side of the Northern Entrance into Cockle Gatt.

2. 10 fathoms; sand; 3 knots.
4. William Davie, Great Yarmouth.
5. 1707, renewed in 1714, 1738, and January 1826; 1738, by Robert Hamblin, of Lynn, Norfolk; 1826, by Lient. Hewett, R.N. (through the Admiralty). See Floating Lights, General Return, 20.
6. To mark the northern entrance to Yarmouth Roads.
7. Since 30th December 1843.
8. One only.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 158 $\frac{1}{2}$ tons.
12. Northfleet; William Pitcher.
13. Forward, 7 feet 3 inches; aft, 7 feet 8 inches.
14. Red.
15. A red hall at the masthead. Name on the sides of the vessel.
16. 1 mast 69 feet long, 1 stayail, and 1 trysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, 2 bower anchors, 105 fathoms chain.
19. Patent proved short-linked chain $\frac{1}{2}$ inch iron. Mushroom, 33 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. 37 feet.
22. 6 $\frac{1}{2}$ miles.
23. 10 miles.
24. Revolving; bright.
25. Once in four minutes, showing a flash every minute.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine.
28. 4 burners.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 18 days.
34. 18 days.
35. 2,978*l.* 2*s.* 6*d.*
36. 3,859*l.* 11*s.* 6*d.*
37. 56*l.* 18*s.* 7*d.* 1857, general repair, 466*l.* 0*s.* 3*d.*
38. 11.
39. 1 master - £ s. d.
- 5 0 0 per mon.: 1 suit uniform: 20*l.* per ann.
house rent.
- 1 mate - 4 0 0 " " " " { At present an allowance of
- 3 lamplighters 2 12 0 " " " " { 10 per cent.
- 1 carpenter - 2 17 0 " " " " { additional on
- 4 seamen - 2 7 0 " " " " { wages.
- 1 " - 2 9 6 " " " " }
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per man per day. See Floating Lights, General Return, 20.
42. 506*l.* 3*s.* 10*d.*
43. 422*l.* 19*s.*, including revolving apparatus.
44. 1857, 7*l.* 12*s.* 2*d.* 1858, 7*l.* 16*s.* 9*d.*
45. 1857, oil, 164 gallons; wicks, 84 dozen. 1858, oil, 173 gallons; wicks, 77 dozen.
46. Rapessed, 1857, 4*s.* per gallon. 1858, 3*s.* 3*d.*, ditto. Cost for 1857, 32*l.* 16*s.*; ditto for 1858, 28*l.* 2*s.* 8*d.*
47. Argand cotton, 2*s.* 6*d.* per gross. 1857, 17*s.* 6*d.* 1858, 16*s.* 6*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 7*9*²₇*l.* 11*s.* ¹/₂*d.* Do., 1858, 449*l.* 16*s.* 3*d.*
Total for year 1852, 2,800*l.* 0*s.* 6*d.*
51. 1852, 847*l.* 7*s.* 1858, 851*l.* 9*s.* 11*d.* See Floating Lights, General Return, 20.
52. 5*s.* 5*d.* Nil. See Floating Lights, General Return, 20.
53. 56, 57. Nil.
54. By Committees of Elder Brethren in 1858, and by Assistant Agent in charge of monthly reliefs.
55. At the time of effecting the monthly relief.
56. 1849, 28th to 31st December, chain parted and position of vessel made it necessary to extinguish light; extinguished during nights of 28th, 29th, and 30th December. 1856, 12th and 13th November chain parted, and position of vessel made it necessary to extinguish light; extinguished from 5.40 a.m. on the 12th November and during the night of the 12th and 13th November.
57. 1849, 28th to 31st December, chain parted nearly 3*1*/₂ days. 1854, 12th to 13th November, chain parted about thirty hours.
58. Aneroid barometer, with thermometer attached, and three compasses.
59. 63, 64, 65. See Floating Lights, General Return, 20.
60. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
61. By steam vessel from Great Yarmouth once a month.
62. Yes, at Yarmouth; as soon as she could be towed to the station.

8.

ST. NICHOLAS GATT.

North End of the Kettlebottom Sand.

2. 6 fathoms; sand; 3 knots.
4. William Davie, Great Yarmouth.
5. May 1826, by Captain Manby, of Great Yarmouth; renewed May 1834, by General Shipowners' Society and trade of London, and ports generally on the east coast. See Floating Lights, General Return, 20.
6. To mark the fairway between the Scroby and Corton Sands, entering Yarmouth Roads through Hewett's Channel.
7. Since 1st January 1837.
8. Two; unequal heights.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 155 tons.
12. Great Yarmouth; Frederick Preston.
13. Forward, 7 feet; aft, 8 feet 1 inch.
14. Red.
15. Red ball at the masthead. Name on the sides of the vessel.
16. 2 masts, one 69 feet long, one 12 feet; and 1 stayail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms ground chain between two mushroom anchors, with 150 fathoms bridle chain to centre ring. Ground tackle, two bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain $\frac{1}{2}$ inch iron. Two mushrooms 33 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. Upper, 38 feet; lower, 14 feet.
22. Upper, 6 $\frac{1}{2}$ miles; lower, 4 miles.
23. 10 and 4 miles.
24. Both fixed; upper bright, lower red.
25. Both stationary.
26. See Floating Lights, General Return, 20.
27. Upper, catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors of 12 inches diameter. Lower, dioptric; small lenticular apparatus complete with 2 concentric wick lamps; red shade round the lamp.
28. Upper, 8 burners; lower, 5th order.
29. No alteration in character of upper light. 1st November 1856, red (lower) light first exhibited.
30. William Wilkins and Co., London.
31. Catoptric. See Floating Lights, General Return, 20. Dioptric, lantern and lamp fixed on short mast 12 feet above the deck.
32. Gong.
33. 23 days.
34. 24 days.
35. 1,751*l.* 10*s.*
36. 2,781*l.* 5*s.* 9*d.*
37. 64*l.* 18*s.* 2*d.* 1851, general repair, 996*l.* 15*s.* 9*d.* 1858, ditto, 390*l.* 0*s.* 7*d.*
38. 11.
39. 1 master - £ s. d.
- 5 0 0 per mon.: 1 suit uniform: 20*l.* per ann.
house rent.
- 1 mate - 4 0 0 " " " " { At present an allowance of
- 3 lamplighters 2 12 0 " " " " { 10 per cent.
- 1 carpenter - 2 17 0 " " " " { additional on
- 5 seamen - 2 7 0 " " " " { wages.
- 1 " - 2 9 6 " " " " }
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 602*l.* 2*s.* 2*d.*
43. Catoptric, 298*l.* 16*s.* 3*d.* Dioptric, 217*l.* 8*s.* 2*d.*
44. 1857, 15*l.* 4*s.* 5*d.* 1858, 11*l.* 13*s.* 8*d.*
45. 1857, oil, 354 gallons; wicks, 89 dozen. 1858, oil, 353 gallons; wicks, 77 dozen. Both lights for oil.
46. Rapessed, 1857, imperial gallon, 9 lbs. at 4*s.*, 70*l.* 16*s.* 1858, ditto at 3*s.* 3*d.*, 57*l.* 7*s.* 3*d.*
47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 18*s.* 6*d.* 1858, 16*s.* 6*d.* Concentric cotton, at 5*d.* per yard. 1857, 194 yards, 8*s.* 9*d.* 1858, 104 yards, 4*s.* 11*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 7*9*²₇*l.* 6*s.* 5*d.* Do., 1858, 454*l.* 7*s.* 9*d.*
Total income for 1852, 2,828*l.* 15*s.* 10*d.*
51. 1852, 839*l.* 12*s.* 9*d.* 1858, 1,355*l.* 19*s.* 2*d.* See Floating Lights, General Return, 20.
52. 5*s.* 5*d.* Nil. See Floating Lights, General Return, 20.
53. 56, 57. Nil.
54. By Committees of Elder Brethren and by the Assistant Agent in charge of monthly reliefs.
55. At the time of effecting the monthly reliefs.
56. 1857, 9th and 10th March, 7.20 p.m. on the 9th to 6.20 a.m. on the 10th; position of vessel when chain parted made it necessary to extinguish light (duration 11 hours).
57. 1857, 9th and 10th March, chain parted for 10 hours.
58. Aneroid barometer, with thermometer attached, and three compasses.
59. 63, 64, 65. See Floating Lights, General Return, 20.
60. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
61. By steam vessel from Great Yarmouth once a month.
62. Yes, at Great Yarmouth; as soon as she could be towed to the station.

9.

STANFORD.

Near the North End of the Newcome Sand,
off Lowestoft, towards Mid-Channel.

2. 6½ fathoms; blue clay; 3½ knots.
 4. William Davie, Great Yarmouth.
 5. November 1814. Owners and masters of ships of Newcastle, Hull, and other northern ports interested in the coal, Baltic, and coasting trade. See Floating Lights, General Return, 20.
 6. For leading clear of the Newcome and through the Stanford Channel.
 7. Since 21st August 1815.
 8. Two; horizontal.
 9. Length, extreme, 73 feet; breadth, 21 feet.
 10. Wood.
 11. 129½ tons.
 12. Blackwall; Garrett and Westbrook.
 13. Forward, 7 feet 4 inches; aft, 7 feet 8 inches.
 14. Red.
 15. Red ball at each masthead. Name on the sides of the vessel.
 16. Two masts, 52 feet each; 2 lugsails, 1 fore staysail, 1 main staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 150 fathoms ground chain between two mushroom anchors, with 150 fathoms bridle chain to centre ring. Ground tackle, two bower anchors and 100 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Two mushroom rods, 32 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 23 feet.
 22. 5 miles.
 23. 10 miles.
 24. Fixed; bright.
 25. Both stationary.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ¼ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 16 burners; 8 in each lantern.
 29. None.
 30. William Wilkins and Co., London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 24 days.
 34. 24 days.
 35. 1,882*l.* 6*s.* 9*d.*
 36. 3,458*l.* 13*s.* 7*d.*
 37. 61*l.* 15*s.* 9*d.*
 38. 1851, general repair, 415*l.* 9*s.* 1855, ditto, 612*l.* 7*s.* 3*d.*
 38. 11.
- | | | | | | | | | | |
|----------------|---|----|----|---|---|---|-----------|--|-----------------------|
| 39. 1 master | £ | s. | d. | 0 | 0 | 0 | per mon.: | 1 suit uniform : | 20 <i>l.</i> per ann. |
| | | | | | | | | house rent. | |
| 1 mate | - | 4 | 0 | 0 | " | " | | { At present an allowance of 10 per cent. additional on wages. | |
| 3 lamplighters | 2 | 12 | 0 | " | " | " | | | |
| 1 carpenter | - | 2 | 17 | 0 | " | " | | | |
| 5 seamen | - | 2 | 7 | 0 | " | " | | | |
| | | | | | | | | | |
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 65*l.* 8*s.* 6*d.*
 43. One lantern and apparatus new, 350*l.* 19*s.* 11*d.*. One repaired from store.
 44. 1857, 29*l.* 10*s.* 9*d.* 1858, 28*l.* 9*s.* 7*d.*
 45. 1857, oil, 613 gallons; wicks, 151 dozen. 1858, oil, 604 gallons; wicks, 145 dozen.
 46. Rapeseed. 1857, imperial gallon, 9 lbs. at 4*s.*, 122*l.* 12*s.* 1858, ditto, at 3*s.* 3*d.*, 98*l.* 3*s.*
 47. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 11*s.* 5½*d.* 1858, 1*l.* 10*s.* 2½*d.*
 48. 2*l.* 13*s.*
 49. See Floating Lights, General Return, 20.
 50. Included in Return for Lowestoft High Light.
 51. 1852, 941*l.* 9*s.* 11*d.* 1858, 958*l.* 18, 11*d.* See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of Elder Brethren and by Assistant Agent in charge of monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Great Yarmouth.
 67. By steam vessel from Great Yarmouth once a month.
 68. Yes, at Great Yarmouth; as soon as she could be towed to the station.

10.

SHIPWASH.

On the North-east End of the Sand off
Orfordness.

2. 9 fathoms; sandy; three knots.
 4. The Light Committee of the Board.
 5. February 1834. The trade of South Shields, Newcastle, and Tynemouth; shipowners and others of the port of London. See Floating Lights, General Return, 20.
 6. To mark north-east end of sand and north-east entrance to Shipway.
 7. Since 1st January 1837.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 158 ½ tons.
 12. Blackwall; M. and H. L. Wigram.
 13. Forward, 7 feet; aft, 8 feet.
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. 1 mast, 69 feet long; 1 lugsail, 1 staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 105 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Mushroom anchor, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Fixed; bright.
 25. Not revolving.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ¼ of an inch, and parabolic reflectors of 12 inches diameter.
 28. Eight burners.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 22 days.
 34. 23 days.
 35. 2,845*l.* 14*s.* 6*d.*
 36. 3,833*l.* 6*s.* 4*d.*
 37. 94*l.* 7*s.* 7*d.* 1857, general repair, 464*l.* 5*s.* 11*d.*
 38. 11.
- | | | | | | | | | | |
|----------------|---|----|----|---|---|---|-----------|--|-----------------------|
| 39. 1 master | £ | s. | d. | 0 | 0 | 0 | per mon.: | 1 suit uniform : | 20 <i>l.</i> per ann. |
| | | | | | | | | house rent. | |
| 1 mate | - | 4 | 0 | 0 | " | " | | { At present an allowance of 10 per cent. additional on wages. | |
| 3 lamplighters | 2 | 15 | 0 | " | " | " | | | |
| 1 carpenter | - | 3 | 0 | 0 | " | " | | | |
| 2 seamen | - | 2 | 10 | 0 | " | " | | | |
| 3 " | - | 2 | 12 | 6 | " | " | | | |
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 506*l.* 3*s.* 10*d.*
 43. 329*l.* 19*s.* 1*d.*
 44. 1857, 8*l.* 3*s.* 10*d.* 1858, 10*l.* 11*s.* 6*d.*
 45. 1857, oil, 291 gallons; wicks, 80 dozen. 1858, oil, 315 gallons; wicks, 92 dozen.
 46. Rapeseed. 1857, imperial gallon, 9 lbs. at 4*s.*, 58*l.* 4*s.* 1858, ditto, at 3*s.* 3*d.*, 51*l.* 3*s.* 9*d.*
 47. Argand cotton, 2*s.* 6*d.* per gross. 1857, 16*s.* 8*d.* 1858, 19*s.* 2*d.*
 48. 2*l.* 13*s.*
 49. See Floating Lights, General Return, 20.
 50. 1852, 746*l.* 12*s.* 9*d.* 1858, 422*l.* 3*s.* 7*d.* Total for 1852, 2,690*l.* 7*s.* 9*d.*
 51. 1852, 843*l.* 8*s.* 5*d.* 1858, 1,144*l.* 8*s.* 1*d.* See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committee of Elder Brethren and by officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Blackwall.
 67. By sailing cutter from Harwich once a month.
 68. Yes, at Blackwall; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

11.

SUNK.

Fairway of the East Swin.

2. 10 fathoms; stiff clay; three knots.
4. The Light Committee of the Board.
5. Proposed 1776; applied for by the trade, 1795. See Floating Lights, General Return, 20.
6. To mark north-east entrance to East Swin, and to guide vessels round Long Sand.
7. Since 20th April 1802.
8. One only.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 158 $\frac{1}{2}$ tons.
12. Blackwall; M. and H. L. Wigram.
13. Forward, 7 feet; aft, 8 feet.
14. Red.
15. A red ball at the masthead. Name on sides of the vessel.
16. One mast, 69 feet long; one lugsail, one staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain $1\frac{1}{2}$ inch iron. Mushroom, 40 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Company, Millwall.
21. 38 feet.
22. 6 $\frac{1}{2}$ miles.
23. 10 miles.
24. Fixed; bright.
25. Not revolving.
26. See Floating Lights, General Return, 50.
27. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors of 12 inches diameter.
28. Eight burners.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 21 days.
34. 22 days.
35. 2,868*l.* 14*s.* 6*d.*
36. 3,716*l.* 10*s.* 2*d.*
37. 70*l.* 9*s.* 2*d.* 1857, general repair, 331*l.* 11*s.* 9*d.*
38. 11.
39. 1 master - $\frac{\text{£}}{5}$ $\frac{\text{s.}}{0}$ $\frac{\text{d.}}{0}$ per mon.: 1 suit uniform; 20*l.* per ann. house rent.

1 mate	-	4	0	0	"	"
3 lamplighters	2	15	0	"	"	"
1 carpenter	-	3	0	0	"	"
3 seamen	-	2	10	0	"	"
2 seamen	-	2	12	6	"	"

 { At present an allowance of 10 per cent. additional on wages.
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 524*l.* 0*s.* 2*d.*
43. 327*l.* 14*s.* 11*d.*
44. 1857, 8*l.* 11*s.* 3*d.* 1858, 10*l.* 4*s.* 6*d.*
45. 1857, oil, 288 gallons; wicks, 77 dozen. 1858, oil, 303 gallons; wicks, 79 dozen.
46. Rapeseed. 1857, imperial gallon, 9 lbs. at 4*s.*, 57*l.* 13*s.* 1858, ditto at 3*s.* 3*d.*, 49*l.* 4*s.* 3*d.*
47. Argand cotton at 2*s.* 6*d.* per gross. 1857, 16*s.* 0 $\frac{1}{2}$ *d.* 1858, 16*s.* 5 $\frac{1}{2}$ *d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. 1852, 1,985*l.* 12*s.* 3 $\frac{1}{2}$ *d.* 1858, 1,311*l.* 3*s.* 3*d.* Total for 1852, 7,523*l.* 9*s.* 0 $\frac{1}{2}$ *d.* Includes the Galloper.
51. 1852, 850*l.* 14*s.* 11*d.* 1858, 921*l.* 4*s.* 9*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. By Committees of Elder Brethren in both years.
59. 1857, 25th August; 1858, 27th August.
- 60, 61. No.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Blackwall.
67. By sailing cutter from Harwich once a month.
68. Yes, at Blackwall; so soon as she could be towed to the station.

12.

GALLOPER.

South-west Part of the Shoal.

2. 20 fathoms; clay and sand; 2 $\frac{1}{2}$ knots.
4. The Light Committee of the Board.
5. 16th October 1803, by the Admiralty. See Floating Lights, General Return, 20.
6. To mark the shoal and keep vessels to the westward of it.
7. Since 21st January 1804.
8. Two; horizontal.
9. Length, extreme, 80 feet; breadth, 21 feet
10. Wood.
11. 158 $\frac{1}{2}$ tons.
12. Northfleet (Kent); William Pitcher.
13. Forward, 7 feet; aft, 8 feet.
14. Red.
15. Red ball at each masthead. Name on the sides of the vessel.
16. Two masts, one 69 feet, one 60 feet; one lugsail, one large staysail, one small staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 165 fathoms chain.
19. Patent proved short-linked chain $1\frac{1}{2}$ inch iron. Mushroom, 40 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Company, Millwall.
21. Both thirty-eight feet.
22. Both 6 $\frac{1}{2}$ miles.
23. Both ten miles.
24. Both fixed and bright.
25. Both stationary.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors of 12 inches diameter.
28. 16 burners, 8 in each lantern.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 23 days.
34. 23 days.
35. 2,978*l.* 2*s.* 6*d.*
36. 3,850*l.* 4*s.* 9*d.*
37. 50*l.* 17*s.* 11*d.* 1856, general repair, 680*l.* 1*s.* 10*d.*
38. 11.
39. 1 master - $\frac{\text{£}}{5}$ $\frac{\text{s.}}{0}$ $\frac{\text{d.}}{0}$ per mon.: 1 suit uniform; 20*l.* per ann. house rent.

1 mate	-	4	0	0	"	"
3 lamplighters	2	15	0	"	"	"
1 carpenter	-	3	0	0	"	"
3 seamen	-	2	10	0	"	"
2 seamen	-	2	12	6	"	"

 { At present an allowance of 10 per cent. additional on wages.
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 602*l.* 9*s.* 10*d.*
43. 627*l.* 6*s.* 7*d.*
44. 1857, 17*l.* 18*s.* 3*d.* 1858, 19*l.* 18*s.* 1*d.*
45. 1857, oil, 621 gallons; wicks, 260 dozen. 1858, oil, 590 gallons; wicks, 244 dozen.
46. Rapeseed. 1857, imperial gallon, 9 lbs. at 4*s.*, 124*l.* 4*s.* 1858, ditto at 3*s.* 3*d.*, 95*l.* 17*s.* 6*d.*
47. Argand cotton at 2*s.* 6*d.* per gross. 1857, 2*l.* 14*s.* 2*d.* 1858, 2*l.* 10*s.* 10*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. No toll.
51. 1852, 946*l.* 10*s.* 2*d.* 1858, 1,236*l.* 14*s.* 9*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. By Committees of the Elder Brethren and by sailing master of steamer in 1858.
59. 1858, by Committees, 5th February; 5th March; 3rd June; 8th July; 4th August. Sailing master, 4th August; 8th September; 8th October.
- 60, 61. No.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Blackwall.
67. By steam vessel from Blackwall once a month.
68. Yes, at Blackwall; so soon as she could be towed to the station.

13.

CORK.

Near the Cork Ledge, Harwich Harbour.

2. 4½ fathoms; hard; two knots.
 4. The Light Committee of the Board.
 5. See Floating Lights, General Return, 29.
 6. To mark the approaches to Harwich.
 7. Since 1st May 1844.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 152½ tons.
 12. Jarrow; Thos. and Robt. Brown.
 13. Forward, 7 feet; aft, 8 feet
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. 1 mast 69 feet long, 1 lugsail, and 1 staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms ground chain between 2 mushroom anchors, with 150 fathoms bridle chain to the centre ring. Ground tackle, 2 bower anchors and 103 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron; 2 mushroom, 32 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Revolving; bright.
 25. Once in 2 minutes, showing a flash every 30 seconds.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter; clockwork revolving machine.
 28. 4 burners.
 29. None.
 30. Robt. Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 17 days.
 34. 20 days.
 35. 1,178*l.*
 36. 2,301*l.* 4*s.* 3*d.*
 37. 59*l.* 19*s.* 2*d.* 1857, general.
 38. 11.
- | | | |
|-----------------|----------|--|
| | £ s. d. | |
| 39. 1 master | - 5 0 0 | per mon.: 1 suit uniform: 2 <i>l.</i> per ann. |
| 1 mate | - 4 0 0 | " " " " " " " " " " " " |
| 3 lamp-lighters | - 2 15 0 | " " " " " " " " " " " " |
| 1 carpenter | - 3 0 0 | " " " " " " " " " " " " |
| 3 seamen | - 2 10 0 | " " " " " " " " " " " " |
| 2 " | - 2 12 6 | " " " " " " " " " " " " |
- { At present an allowance of 10 per cent. additional on wages.
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 60*l.* 3*s.* 2*d.*
 43. 360*l.* 19*s.* 6*d.*
 44. 1857, 5*l.* 19*s.* 8*d.* 1858, 5*l.* 6*s.* 4*d.*
 45. 1857, oil, 152 gallons; wicks, 57 dozen. 1858, oil, 155 gallons; wicks, 56 dozen.
 46. Rapeseed. 1857, imperial gallon, 9 lbs. at 4*s.*, 30*l.* 7*s.* 1858, ditto at 3*s.* 3*d.*, 25*l.* 3*s.* 9*d.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 11*s.* 10½*d.* 1858, 11*s.* 8*d.* 4*s.* 2*d.* 13*s.*
 48. See Floating Lights, General Return, 20.
 49. Midsummer quarter, 1852, 754*l.* 5*s.* 7½*d.* Midsummer quarter, 1858, 425*l.* 17*s.* 3*d.* Total income, 1852, 2,714*l.* 14*s.* 0½*d.*
 51. 1852, 842*l.* 9*s.* 4*d.* 1858, 1,014*l.* 10*s.* 5*d.* See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of the Elder Brethren and by officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and 3 compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by steam vessel from Blackwall.
 67. By sailing cutter from Harwich once a month.
 68. Yes, at Blackwall; so soon as she could be towed to the station.

14.

KENTISH KNOCK.

East Side of the Sand.

2. 12 fathoms; stiff clay and sand; 2½ knots.
 4. The Light Committee of the Board.
 5. November 1838, by the General Shipowners' Society, Lloyd's Register of Shipping, and coal and coasting trade, &c. of ports in the English Channel and North Sea. See Floating Lights, General Return, 20.
 6. To keep vessels to the eastward of the sand and to mark it.
 7. Since 1st September 1840. Since March 1841 present position.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 158½ tons.
 12. Blackwall; M. and H. L. Wigram.
 13. Forward, 7 feet; aft, 8 feet.
 14. Red.
 15. Two red balls at the masthead, vertical (lower ball is larger than the upper). Name on sides of the vessel.
 16. 1 mast 69 feet long, 1 lugsail, and 1 staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, 2 bower anchors and 165 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron; mushroom, 40 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Revolving; bright.
 25. Once in 4 minutes, showing a flash every minute.
 26. See Floating Lights, General Return, 20.
 27. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter; clockwork revolving machine.
 28. 4 burners.
 29. None.
 30. Robt. Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 19 days.
 34. 19 days.
 35. 2,400*l.* 4*s.* 4*d.*
 36. 3,706*l.* 9*s.* 0½*d.*
 37. 62*l.* 7*s.* 3*d.* 1852, general repairs, 1,357*l.* 13*s.* 11*d.*
 38. 11.
- | | | |
|-----------------|----------|--|
| | £ s. d. | |
| 39. 1 master | - 5 0 0 | per mon.: 1 suit uniform: 2 <i>l.</i> per ann. |
| 1 mate | - 4 0 0 | " " " " " " " " " " " " |
| 3 lamp-lighters | - 2 15 0 | " " " " " " " " " " " " |
| 1 carpenter | - 3 0 0 | " " " " " " " " " " " " |
| 2 seamen | - 2 10 0 | " " " " " " " " " " " " |
| 3 " | - 2 12 6 | " " " " " " " " " " " " |
- { At present an allowance of 10 per cent. additional on wages.
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 60*l.* 9*s.* 10*d.*
 43. 612*l.* 14*s.* 8*d.*, including revolving apparatus.
 44. 1857, 12*l.* 15*s.* 10*d.* 1858, 10*l.* 10*s.* 6*d.*
 45. 1857, oil, 140 gallons; wicks, 58 dozen. 1858, oil, 159 gallons; wicks, 54 dozen.
 46. Rapeseed, 1857, imperial gallon, 9 lbs. at 4*s.*, 25*l.* 1858, ditto, 3*s.* 3*d.*, 25*l.* 16*s.* 9*d.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 12*s.* 1858, 11*s.* 3*d.* 4*s.* 2*d.* 13*s.*
 48. See Floating Lights, General Return, 20.
 49. Midsummer quarter, 1852, 439*l.* 9*s.* 0½*d.* Midsummer quarter, 1858, 374*l.* 8*s.* 4*d.* Total income for 1852, 1,683*l.* 14*s.* 2½*d.*
 51. 1852, 807*l.* 5*s.* 3*d.* 1858, 863*l.* 6*s.* 7*d.* See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of Elder Brethren and by officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and 3 compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by steam vessel from Blackwall.
 67. By steam vessel from Blackwall once a month.
 68. Yes, at Blackwall; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

15.

SWIN MIDDLE.

West End of the Sand.

2. Four fathoms; sand and mud; 2 knots.
4. The Light Committee of the Board.
5. February 1834. London and Edinburgh Steam Packet Company and shipowners and others of the port of London—See Floating Lights, General Return, 20.
6. To mark the S.W. end of the "Middle," and for navigating the Swin.
7. Since 1st January 1837.
8. One only.
9. Length, extreme, 84 feet; breadth, 22 feet.
10. Wood.
11. 158½ tons.
12. Poplar; Joseph Fletcher.
13. Forward, 7 feet; aft, 8 feet.
14. Red.
15. Red ball at the masthead. Name on sides of the vessel.
16. One mast, 69 feet long, 1 lugsail, 1 staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms ground chain between 2 mushroom anchors, with 165 fathoms bridle chain to centre ring. Ground tackle, 2 bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain 1½ inch iron. Two mushrooms, 32 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. 38 feet.
22. 6½ miles.
23. 10 miles.
24. Revolving; bright.
25. Once in two minutes, showing a flash every 30 seconds.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine.
28. Four burners.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 22 days.
34. 22 days.
35. 2,427l. 2s.
36. 3,726l. 7s. 5d.
37. 55l. 2s. 1d. 1858, general repair, 565l. 13s. 1d.
38. 11.
39. 1 master - £ s. d.

1 mate	- 4	0	0	"	"	{ At present an allowance of 10 per cent. additional on wages.
3 lamplighters	2	15	0	"	"	
1 carpenter	- 3	0	0	"	"	
4 seamen	- 2	10	0	"	"	
3 "	- 2	12	6	"	"	
40. 301l. 2s. 6d., victualling allowance.
41. 1s. 6d. per day per man.
42. 621l. 14s. 7d.
43. 642l. 5s. 11d., including revolving apparatus.
44. 1857, 9l. 8s. 7d. 1858, 8l. 10s. 7d.
45. 1857, oil, 162 gallons; wicks, 66 dozen. 1858, oil, 161 gallons; wicks, 50 dozen.
46. Rapeseed. 1857, imperial gallon, 9 lbs., at 4s., 32l. 8s. 1858, ditto, at 3s. 3d., 26l. 3s. 3d.
47. Argand cotton, at 2s. 6d. per gross. 1857, 13s. 9d. 1858, 10s. 5d. 4s. 2l. 13s.
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 483l. 3s. 10½d. 1858, 208l. 18s. 10d. Total income, 1852, 1,715l. 0s. 6½d.
51. 1852, 814l. 13s. 8d. 1858, 1,527l. 10s. See Floating Lights—General Return, 20.
- 52, 53, 54. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. By Committees of Elder Brethren and officer in charge of the monthly reliefs.
59. At the time of effecting the monthly reliefs.
- 60, 61. No.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Blackwall.
67. By steam vessel from Blackwall once a month.
68. Yes, at Blackwall; as soon as she could be towed to the station.

16.

MOUSE.

West End of the Sand.

2. Four fathoms; sandy; 2½ knots.
4. The Light Committee of the Board.
5. November 1837. General Steam Navigation Company. See Floating Lights, General Return, 20.
6. To lead clear of the sand and mark the entrance to the Swin.
7. Since 25th July 1838.
8. One only.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 158½ tons.
12. Blackwall; William Pitcher.
13. Forward, 7 feet; aft, 8 feet.
14. Red.
15. Red ball at the masthead. Name on sides of the vessel.
16. One mast, 69 feet long; 1 lugsail; 1 staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms ground chain between two anchors, with 165 fathoms bridle chain to centre ring. Ground tackle, 2 bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain 1½ inch iron; 2 anchors, single flaked, 24 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. 38 feet.
22. 6½ miles.
23. 10 miles.
24. Fixed; bright.
25. Not revolving.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter.
28. Eight burners.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 17 days.
34. 17 days.
35. 2,669l. 2s. 5d.
36. 3,689l. 18s.
37. 79l. 0s. 4d. In 1851, 764l. 8s. 11d.
38. 11.
39. 1 master - £ s. d.

1 mate	- 4	0	0	"	"	{ At present an allowance of 10 per cent. additional on wages.
3 lamplighters	2	15	0	"	"	
1 carpenter	- 3	0	0	"	"	
2 seamen	- 2	10	0	"	"	
3 "	- 2	12	6	"	"	
40. 301l. 2s. 6d.
41. 1s. 6d. per day per man.
42. 547l. 12s. 5d.
43. 501l. 6s. 10d.
44. 1857, 11l. 3s. 10d. 1858, 11l. 10s.
45. 1857, oil, 295 gallons; wicks, 116 dozen. 1858, oil, 307 gallons; wicks, 111 dozen.
46. Rapeseed. 1857, 4s.; total cost, 59l. 1858, 3s. 3d.; total cost, 49l. 17s. 9d.
47. Argand cotton, 2s. 6d. per gross. 1857, total cost, 24s. 2d. 1858, 23s. 1½d.
48. 2l. 13s.
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 470l. 5s. 3½d. Ditto, 1858, 208l. 18s. 10d. Total for 1852, 1,690l. 5s. 8½d.
51. 1852, 830l. 18s. 11d. 1858, 876l. 13s. 6d. See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
55. Nil.
56. See Return for Maplin Lighthouse.
57. Nil.
58. By Committees of the Elder Brethren and officer in charge of the monthly reliefs.
59. At the time of effecting the monthly relief.
60. 1852, 27th to 29th December, cable parted, and position of vessel made it necessary to extinguish light. Light extinguished from 3 a.m. on the 27th December and the whole of the night of the 28th December.
61. 1852, 27th to 29th December, cable parted 41 hours.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by steam vessel from Blackwall.
67. By steam vessel from Blackwall once a month.
68. Yes, at Blackwall; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

17.

NORE.

East End of the Sand.

- 2. 3 fathoms; sandy; 14 knots.
- 4. The Light Committee of the Board.
- 5. 1752, by David Avery, and principal merchants, owners, and masters of vessels passing the Norc Sand. See Floating Lights, General Return, 20.
- 6. Best position for entering the Thames and Medway, and to clear the Norc Sand.
- 7. Since 1732.
- 8. One only.
- 9. Length, extreme, 80 feet; breadth, 21 feet.
- 10. Wood.
- 11. 155½ tons.
- 12. Great Yarmouth; Frederick Preston.
- 13. Forward, 7 feet; aft, 8 feet.
- 14. Red.
- 15. Red ball at the masthead. Name on sides of the vessel.
- 16. One mast 29 feet long, 1 lugsail, and 1 staysail.
- 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
- 18. Moored by 210 fathoms ground chain between 2 mushroom anchors, with 165 fathoms bridle chain to centre ring. Ground tackle, two bower anchors and 105 fathoms chain.
- 19. Patent proved short-linked chain 1½ inch iron; 2 mushrooms, 32 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
- 20. Brown, Lenox, and Company, Millwall.
- 21. 38 feet.
- 22. 6½ miles.
- 23. 10 miles.
- 24. Revolving; bright.
- 25. Once in two minutes, showing a flash every 30 seconds.
- 26. See Floating Lights, General Return, 20.
- 27. Catoptric. Argand lamps, burners 1 of an inch, and parabolic reflectors of 12 inches diameter; clockwork revolving machine.
- 28. 4 burners.
- 29. None.
- 30. William Wilkins and Company, London.
- 31. See Floating Lights, General Return, 20.
- 32. Gong.
- 33. 23 days.
- 34. 23 days.
- 35. 1,743*l.* 15*s.*
- 36. 2,677*l.* 1*s.* 10*d.*
- 37. 48*l.* 12*s.* 1855, general repair, 4*l.* 13*s.* 4*d.* 1858, ditto, 442*l.* 17*s.* 8*d.*
- 38. 11.
- 39. 1 master - 5 0 0 per mon.; 1 suit uniform: 30*l.* per ann. house rent.
- 1 mate - 4 0 0 " " "
- 3 lamp-lighters 2 15 0 " " " (At present an allowance of 10 per cent.
- 1 carpenter - 3 0 0 " " " "
- 4 scannin - 2 10 0 " " " additional un-
- 1 " - 2 12 6 " " " wages.
- 40. 30*l.* 2*s.* 6*d.* victualling allowance.
- 41. 1*s.* 6*d.* per man per day.
- 42. 75*l.* 1*s.* 3*d.*
- 43. Apparatus not new; repairs, 193*l.* 15*s.* 9*d.*
- 44. 1857, 7*l.* 8*s.* 4*d.* 1858, 6*l.* 14*s.* 1*d.*
- 45. 1857, oil, 146 gallons; wicks, 52 dozen. 1858, oil, 155 gallons; wicks, 53 dozen.
- 46. Rapessed, 1857, 4*s.* per gallon; 1858, 3*s.* 3*d.* per gallon. Cost for 1857, 49*l.* 4*s.*; ditto for 1858, 25*l.* 3*s.* 9*d.*
- 47. Argand cotton, 2*s.* 6*d.* per gross. 1857, 10*s.* 10*d.* 1858, 11*s.* 0*d.*
- 48. 2*l.* 13*s.*
- 49. See Floating Lights, General Return, 20.
- 50. Midsummer quarter, 1852, 87*l.* 14*s.*; ditto, 1858, 644*l.* 18*s.* 1*d.* Total for 1852, 3,797*l.* 16*s.*
- 51. 1852, 809*l.* 2*s.* 1858, 1,351*l.* 11*s.* 5*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
- 58. By Committees of Elder Brethren and officer in charge of the monthly reliefs.
- 59. At the time of effecting the monthly relief.
- 60. 1849, 28th to 30th December chain parted, and position of vessel made it necessary to extinguish light; extinguished during the nights of 28th and 29th December, 1851, 20th October, vessel struck by a brig; extinguished for 10 minutes.
- 61. 1849, 28th to 30th December, chain parted nearly 2 days.
- 62. Aneroid barometer, with thermometer attached, and 3 compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
- 66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by steam vessel from Blackwall.
- 67. By steam vessel from Blackwall once a month.
- 68. Yes, at Blackwall; as soon as she could be towed to the station.

18.

TONGUE.

East Tongue Sand.

- 2. 10 fathoms; sand; 1½ knots.
- 4. The Light Committee of the Board.
- 5. June 1847. Certain shipowners, directors of steam shipping companies, and others interested in the shipping of the Port of London. See Floating Lights, General Return, 20.
- 6. To mark the entrance of the Princes Channel.
- 7. Since 1st October 1848.
- 8. Two; unequal heights.
- 9. Length, extreme, 80 feet; breadth, 21 feet.
- 10. Wood.
- 11. 158½ tons.
- 12. Blackwall; Richard and Henry Green.
- 13. Forward, 7 feet; aft, 8 feet.
- 14. Red.
- 15. Red ball at the masthead. Name on the sides of the vessel.
- 16. 2 masts, one 69 feet long, and one 12 feet long, 1 lugsail, and 1 staysail.
- 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
- 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 105 fathoms chain.
- 19. Patent proved short-linked chain 1½ inch iron. Mushroom, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
- 20. Brown, Lenox, and Company, Millwall.
- 21. Upper light, 38 feet; lower light, 14 feet.
- 22. Upper, 6½ miles; lower, 4 miles.
- 23. Upper, 10 miles; lower, 4 miles.
- 24. Both fixed; upper, bright; lower, red.
- 25. Both stationary.
- 26. See Floating Lights, General Return, 20.
- 27. Upper, catoptric. Argand lamps, burners ¾ of an inch, and parabolic reflectors of 12 inches diameter. Lower, dioptric. Small lenticular apparatus complete, with a two concentric wick pressure lamp. Red shades inside glass of lantern.
- 28. Upper, 3 burners; lower, 5th order.
- 29. March 1855, two of the burners of the upper light taken away by direction of the Board. No alteration in character.
- 30. Robert Wilkins and Son, London.
- 31. Catoptric. See Floating Lights, General Return, 20. Dioptric. Lantern and lamp fixed on short mast 12 feet above the deck.
- 32. Gong.
- 33. 12 days.
- 34. 15 days.
- 35. 2,857*l.* 15*s.* 5*d.*
- 36. 3,854*l.* 1*s.* 3*d.*
- 37. 54*l.* 19*s.* 3*d.* 1854, general repairs, 1,350*l.* 7*s.* 2*d.*
- 38. 11.
- 39. 1 master - 5 0 0 per mon.; 1 suit uniform: 30*l.* per ann. house rent.
- 1 mate - 4 0 0 " " " (At present an allowance of 10 per cent.
- 3 lamp-lighters 15 0 0 " " " "
- 1 carpenter - 3 0 0 " " " "
- 1 scannan - 2 10 0 " " " in addition
- 4 " - 2 12 6 " " " wages.
- 40. 30*l.* 2*s.* 6*d.* victualling allowance.
- 41. 1*s.* 6*d.* per day per man.
- 42. 50*l.* 3*s.* 10*d.*
- 43. Catoptric, 369*l.* 18*s.* Dioptric, 101*l.* 7*s.* 6*d.* (lens only), lantern not new.
- 44. 1859, 19*l.* 1*s.* 9*d.* 1858, 15*l.* 12*s.*
- 45. 1857, oil, 395 gallons (both lights); wicks, 100 dozen; ditto, 14 yards. 1858, oil, 394 gallons; wicks, 99 dozen; ditto, 19½ yards.
- 46. Rapessed, 1857, 4*s.*; cost, 70*l.* 1858, 3*s.* 3*d.*; cost, 64*l.* 0*s.* 6*d.*
- 47. Argand cotton, 2*s.* 6*d.* per gross. 1857, 1*l.* 0*s.* 10*d.* 1858, 1*l.* 0*s.* 7*d.* Concentric cotton, 5½*d.* per yard. 1857, 6*s.* 5*d.* 1858, 6*s.* 2½*d.*
- 48. 2*l.* 13*s.*
- 49. See Floating Lights, General Return, 20.
- 50. Princes Channel—Midsummer quarter, 1852, 743*l.* 11*s.* 9*d.*, two lights; ditto, 1858, 696*l.* 8*s.* 4*d.*, three lights. Total for 1852, 2,785*l.* 14*s.*, two lights.
- 51. 1858, 1,029*l.* 8*s.* 1*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
- 58. By Committees of the Elder Brethren and officer in charge of monthly reliefs.
- 59. At the time of effecting the monthly relief.
- 60. No.
- 61. 1854, 14th to 17th January, parted her cable; three days.
- 62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
- 66. Once a month. The master or mate and six men are always on board. The master or mate and three men on shore in rotation. Relieved by steam vessel.
- 67. By steam vessel from Blackwall once a month.
- 68. Yes, at Blackwall; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

19.

PRINCES CHANNEL.

Between the Tongue and Girdler Lights, Mouth of the Thames.

2. 3½ fathoms; sand; 1½ knots.
4. The Light Committee of the Board.
5. 1850. By James Laming, Manager of the General Screw Steam Shipping Company, and others interested in the navigation of the Princes Channel. See Floating Lights, General Return, 20.
6. The best for navigating the Princes Channel.
7. Since 1st October 1856.
8. One.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 158½ tons.
12. Northfleet; William Pitcher.
13. About 7 feet forward; ditto, 8 feet aft.
14. Red.
15. A red ball at the masthead. Name on sides of the vessel.
16. One mast 69 feet long; one staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms ground chain between two mushroom anchors, with 105 fathoms bridle chain to centre ring. Ground tackle, 2 bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain 1½ inch iron. Two mushrooms, 32 cwt. each; one best bower anchor, 20 cwt.; one spare ditto, 14 cwt.
20. Brown, Lenox, and Company, Millwall.
21. 38 feet.
22. 6½ miles.
23. 10 miles.
24. Revolving; red.
25. Once in two minutes, showing a flash every twenty seconds.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners 1 of an inch, and parabolic reflectors of 12 inches diameter, with red shades. Clockwork revolving machine.
28. 6 burners.
29. None.
30. William Wilkins and Company, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 15 days.
34. 15 days.
35. 2,978*l.* 2*s.* 6*d.*
36. 4,100*l.* 2*s.*, including fixtures for store room, but not lantern apparatus or moorings.
37. 64*l.* 5*s.* 3*d.* since 1856. 1857, general repair, 941*l.* 2*s.* 9*d.*
38. 11.
39. 1 master £ s. d.
- 5 0 0 per mon.; 1 suit uniform: 20*l.* per ann. house rent.
- 1 mate - 4 0 0 " " { At present an allowance of
- 3 lamplighters 2 15 0 " " { 10 per cent.
- 1 carpenter - 3 0 0 " " { additional on
- 2 seamen - 2 10 0 " " { wages.
- 3 " - 2 12 6 " " }
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 680*l.* 11*s.* 7*d.*
43. Lanterns and fitting, 378*l.* 10*s.* 8*d.*; apparatus, 88*l.* 12*s.* 4*d.* Total, 467*l.* 3*s.*
44. 1857, 12*l.* 14*s.* 8*d.* 1858, 11*l.* 14*s.* 11*d.*
45. 1857, oil, 263 gallons; wicks, 94 dozen. 1858, oil, 266 gallons; wicks, 92 dozen.
46. Rapeseed, imperial gallon, 9lbs. 1857, at 4*s.* per gallon, 52*l.* 12*s.* 1858, ditto, at 3*s.* 3*d.* per gallon, 42*l.* 11*s.* 6*d.*
47. Argand cotton at 2*s.* 6*d.* per gross. 1857, 19*s.* 7*d.* 1858, 19*s.* 2*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Nil for 1852. See Return for Tongue Floating Light for 1858.
51. 1858, 896*l.* 1*s.* 5*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. By Committees of Elder Brethren, and by officer in charge of the monthly reliefs.
59. At the time of effecting the monthly reliefs.
- 60, 61. No.
62. Aneroid barometer with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Blackwall.
67. By steam vessel from Blackwall once a month.
68. Yes, at Blackwall; as soon as she could be towed to her station.

20.

GIRDLER.

West Girdler Sand.

2. 3½ fathoms; sandy; 1½ knots.
4. The Light Committee of the Board.
5. June 1847. Certain shipowners, directors of steam shipping companies, and others interested in shipping in the Port London. See Floating Lights, General Return, 20.
6. To mark western entrance to Prince's Channel and to clear adjacent sands.
7. Since 1st October 1848.
8. One only.
9. Length, extreme: 80 feet; breadth, 21 feet.
10. Wood.
11. 158½ tons.
12. Blackwall; Richard and Henry Green.
13. Forward, 7 feet; aft, 8 feet.
14. Red.
15. Red ball at masthead. Name on the sides of the vessel.
16. One mast 69 feet long; one lug sail; one staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms ground chain between two anchors, with 165 fathoms bridle chain to centre ring. Ground tackle, two bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain 1½ inch iron; one single fluked anchor, 30 cwt.; one mushroom, 32 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Company, Millwall.
21. 38 feet.
22. 6½ miles.
23. 10 miles.
24. Revolving; bright.
25. Once in two minutes, showing a flash every 30 seconds.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners 1 of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine.
28. Four burners.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 17 days.
34. 18 days.
35. 2,857*l.* 15*s.* 5*d.*
36. 3,769*l.* 9*s.* 6*d.*
37. 68*l.* 15*s.* 3*d.* 1855, general repair, 1,147*l.* 5*s.* 2*d.*
38. 11.
39. 1 master £ s. d.
- 5 0 0 per mon.; 1 suit uniform: 20*l.* per ann. house rent.
- 1 mate 4 0 0 " " { At present an allowance of
- 2 lamplighters 2 15 0 " " { 10 per cent.
- 1 " 2 17 6 " " { additional on
- 1 carpenter - 3 0 0 " " { wages.
- 3 seamen - 2 10 0 " " }
- 2 " - 2 12 6 " " }
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 756*l.* 19*s.* 5*d.*
43. 393*l.* 15*s.* 11*d.*
44. 1857, 9*l.* 8*s.* 10*d.* 1858, 11*l.* 14*s.* 9*d.*
45. 1857, oil, 157 gallons; wicks, 44 dozen. 1858, oil, gallons; wicks, 44 dozen.
46. Rapeseed, imperial gallon, 9lbs., 1857, at 4*s.* per gallon, 31*l.* 8*s.* 1858, ditto, at 3*s.* 3*d.* per gallon, 23*l.* 16*s.* 9*d.*
47. Argand cotton at 2*s.* 6*d.* per gross. 1857, 9*s.* 2*d.* 1858, 9*s.* 2*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Included in Return for Prince's Channel Floating Light.
51. 1858, 1,052*l.* 5*s.* 9*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. By Committees of Elder Brethren and by officer in charge of the monthly reliefs.
59. At the time of effecting the monthly reliefs.
- 60, 61. No.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six seamen are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel from Blackwall.
67. By steam vessel from Blackwall once a month.
68. Yes, at Blackwall; as soon as she could be towed to the station.

21.
GOODWIN.

Off the North End of the Sand.

2. 9 fathoms; sand, chalk, and stones; 2½ knots.
4. James White, Ramsgate.
5. Proposed 1776; applied for by the trade 1795. See Floating Lights, General Return, 20.
6. To indicate the north end of the Goodwin Sands.
7. Since August 1795.
8. Three; triangular.
9. Length, extreme, 91 feet; breadth, 21 feet.
10. Iron.
11. 175 tons.
12. Govan on the Clyde; Robt. Napier and Sons.
13. Forward, 7 feet 3 inches; aft, 8 feet 3 inches.
14. Red.
15. Red ball at each masthead. Name on the sides of the vessel.
16. 3 masts, one 69 feet, two 52 feet each; 1 lugsail, and 1 fore staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging.
18. Moored by 210 fathoms ground chain between 2 anchors, with 165 fathoms bridle chain to the centre ring. Ground tackle, 2 bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain 1½ inch iron; 2 single fluked anchors, 40 cwt. each; 1 best bower ditto, 20 cwt.; 1 spare ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. Upper, 88 feet; lower, 28 feet.
22. Upper, 6½ miles; lower, 5½ miles.
23. Upper, 10 miles; lower, 10 miles.
24. Upper, fixed, bright; lower, ditto.
25. Not revolving.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 12 inches diameter.
28. 24 burners; 8 in each lantern.
29. None.
30. William Wilkins and Co., London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 19 days.
34. 19 days.
35. 8,650*l.*
36. 5,87*l.* 4*s.* 5*d.*
37. No experience in iron vessels.
38. 11.

	£	s.	d.	
39. 1 master	- 5	0	0	per mon.: 1 suit uniform: 20 <i>l.</i> per ann. house rent.
1 mate	- 4	0	0	" " {At present an allowance of
3 lamplighters	- 2	12	0	" " {10 per cent.
1 carpenter	- 2	17	0	" " {additional on
2 seamen	- 2	7	0	" " {wages.
3 "	- 2	9	6	" "
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 805*l.* 18*s.* 4*d.*
43. Not new; refitting 161*l.* 2*s.* 10*d.*
44. 1857, 18*l.* 7*s.* 6*d.* 1858, 17*l.* 11*s.* 2*d.*
45. 1857, oil, 877 gallons; wicks, 165 dozen. 1858, oil, 850 gallons; wicks, 125 dozen.
46. Rapeseed, 1857, imperial gallon, 9 lbs., at 4*s.*, 175*l.* 8*s.* 1858, ditto, at 3*s.* 3*d.*, 139*l.* 11*s.* 9*d.*
47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 1*l.* 14*s.* 4*d.* 1858, 1*l.* 6*s.* 0*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. Midsummer quarter, 1852, 2,083*l.* 15*s.* 7*d.* Midsummer quarter, 1858, 2,029*l.* 7*s.* 9*d.* Total for 1852, 8,379*l.* 19*s.* 8*d.*
51. 1852, 861*l.* 19*s.* 6*d.* 1858, 1,014*l.* 13*s.* 7*d.*
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. By Committees of Elder Brethren and by officer in charge of monthly reliefs.
59. At the time of effecting the monthly reliefs.
60. 61. No.
62. Aneroid barometer, with thermometer attached, and 3 compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by sailing tender from Ramsgate.
67. By sailing tender from Ramsgate once a month.
68. Yes, at Blackwall; as soon as she could be towed to the station

22.

GULL.

Near the Western Edge of the Sand.

2. 8½ fathoms; fine hard sand; 8½ knots.
4. James White, Trinity Store, Ramsgate.
5. November 1808. Vice-Admiral Campbell (to the Navy Board). See Floating Lights, General Return, 20.
6. To lead through the Gull Stream.
7. Since 29th May 1809.
8. Two; horizontal.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 158½ tons.
12. Blackwall; Richard and Henry Green.
13. About 7 feet 10 inches aft; about 6 feet 9 inches forward.
14. Red.
15. A red ball at each masthead. Name on the sides of the vessel.
16. 2 masts (60 feet long), 2 lugsails, 1 main staysail, and 1 fore ditto.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms ground chain between 2 mushroom anchors, with 195 fathoms bridle chain to centre ring. Ground tackle, 2 bower anchors, 105 fathoms chain.
19. Patent proved short-linked chain 1½ inch iron; mushrooms. 32 cwt. each; 1 bower anchor, 20 cwt.; 1 ditto, 14 cwt.
20. Brown, Lenox, and Co.
21. Both 14 feet.
22. Both 4 miles.
23. Both 7 miles.
24. Both fixed and bright.
25. Both stationary.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors.
28. 16 burners; 8 in each lantern.
29. Character to be altered by direction of the Board in June 1860 from 2 fixed to 1 revolving light, showing a flash every 20 seconds, and revolving once in 2 minutes.
30. William Wilkins and Co., London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 18 days.
34. 19 days.
35. 2,857*l.* 15*s.* 5*d.*
36. 4,197*l.* 9*s.* 8*d.*
37. 11*l.* 10*s.* 7*d.* (frequently damaged). 1853, general repair 70*l.* 15*s.* 8*d.*
38. 11.
39. 1 master - 5 0 0 per mon.: 1 suit uniform: 20*l.* per ann. house rent.

1 mate	- 4	0	0	" "	} (At present an allowance of 10 per cent. additional on wages.)
3 lamplighters	- 2	12	0	" "	
1 carpenter	- 2	17	0	" "	
5 seamen	- 2	9	6	" "	
40. 301*l.* 2*s.* 6*d.*
41. 1*s.* 6*d.* per diem per man.
42. 798*l.* 6*s.* 1*d.*
43. 650*l.* 13*s.* 2*d.*
44. 1857, 13*l.* 2*s.* 9*d.* 1858, 13*l.* 17*s.* 3*d.*
45. 1857, oil, 620 gallons; wicks, 131 dozen. 1858, oil, 612 gallons; wicks, 117 dozen.
46. Rapeseed, 1857, imperial gallon, 9 lbs., at 4*s.*, 124*l.* 1858, ditto, at 3*s.* 3*d.*, 99*l.* 9*s.*
47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 1*l.* 7*s.* 3*d.* 1858, 1*l.* 4*s.* 4*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. No toll.
51. 1852, 1,060*l.* 13*s.* 3*d.* 1858, 931*l.* 5*s.* 5*d.* See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
55. Nil.
56. March 1859. Mr. H. B. Yule, Master R.N., that if the Gull Lightvessel were near the Bunt Head, she would be of much greater utility, and the Bunt Head buoy would be no longer necessary; acquainted that that suggestion should receive due attention. On mature consideration it was determined that the present position is most advantageous.
57. Nil.
58. By Committee of the Elder Brethren and officer in charge of the monthly reliefs.
59. At the time of effecting the monthly reliefs.
60. 20th January 1856. American ship ran foul of lightvessel: extinguished 3 hours.
61. No.
62. Aneroid barometer, with thermometer attached, and 3 compasses.
63. See Floating Lights, General Return, 20. And should the life-boat be required, "a blue light is to follow each rocket."
- 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by sailing vessel.
67. By sailing tender from Ramsgate once a month.
68. Yes, at Blackwall; as soon as could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

23.

SOUTH SAND HEAD.

Off the South End of the Sand.

2. 13 fathoms; sand and chalk; 2½ knots.
 4. James White, Ramsgate.
 5. 1828, by Thomas Bayley, and other Cinque Port pilots and trade of London and ports generally in the English Channel. See Floating Lights, General Return, 20.
 6. To mark the south end of the Goodwin Sand.
 7. Since 25th February 1832.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 145½ tons.
 12. Blackwall; Green, Wigram, and Green.
 13. Forward, 6 feet 10 inches; aft, 7 feet 9 inches.
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. One mast, 69 feet long; one lugsail, one staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 105 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Mushroom about 46 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co, Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Fixed; bright.
 25. Not revolving.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 8 burners.
 29. None.
 30. Wm. Wilkins and Co, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 24 days.
 34. 28 days.
 35. 2,129l. 16s. 6d.
 36. 8,212l. 19s. 11d.
 37. 80l. 16s. 1854, general repair, 855l. 19s. 11d.
 38. 11.
- | | | |
|----------------|----------|---|
| | £ s. d. | |
| 39. 1 master | - 5 0 0 | per mon: 1 suit uniform: 20l. per ann. house rent |
| 1 mate | - 4 0 0 | " " |
| 3 lamplighters | 2 12 0 | " " { At present an allowance of |
| 1 carpenter | - 2 17 0 | " " { 10 per cent. |
| 2 seamen | - 2 7 0 | " " { additional on |
| 3 " | - 2 9 6 | " " { wages. |
40. 301l. 2s. 6d., victualling allowance.
 41. 1s. 6d. per man per day.
 42. 528l. 0s. 3d.
 43. 710l. 14s. 11d.
 44. 1857, 8l. 0s. 5d. 1858, 8l. 14s. 8d.
 45. 1857, oil, 287 gallons; wicks, 49 dozen. 1858, oil, 282 gallons; wicks, 49 dozen.
 46. Rapeseed. 1857, imperial gallon, 9lbs., at 4s., 57l. 8s. 1858, ditto at 3s. 3d., 45l. 16s. 6d.
 47. Argand cotton, at 2s. 6d. per gross. 1857, 10s. 2½d. 1858, 10s. 2½d.
 48. 2l. 13s.
 49. See Floating Lights, General Return, 20.
 50. 1852, 1,148l. 6s. 3½d. 1858, 984l. 1s. 6d. Total for 1852, 4,370l. 19s. 11d.
 51. 1852, 842l. 6s. 4d. 1858, 848l. 9s. See Floating Lights, General Return, 20.
 52. 5s. 5d. Nil. See Floating Lights, General Return, 20.
 53. 5s. 5d. Nil.
 54. By Committee of the Elder Brethren and by officer in charge of the monthly reliefs.
 55. At the time of effecting the monthly reliefs.
 60. No.
 61. 11th March 1853, through heaving cable short, which caused the vessel to drag her mushroom. About noon of the 11th until near noon of 13th March 1853.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 63. 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by sailing vessel from Ramsgate.
 67. By sailing tender from Ramsgate once a month.
 68. Yes, at Blackwall; as soon as she could be towed to the station.

24.

OWERS.

S.E. End of the Shoal off Littlehampton, Sussex.

2. 19 fathoms; flat sandy rock; 3 knots.
 4. Robert Willis, East Cowes, Isle of Wight.
 5. 1788, by the trade. See Floating Lights, General Return, 20.
 6. To mark the Owers Sand.
 7. Since July 1788; since August 1857 in present position.
 8. One only.
 9. Length, extreme, 50 feet; breadth, 21 feet
 10. Wood.
 11. 158½ tons.
 12. Northfleet; William Pitcher.
 13. Forward, 7½ feet; aft, 8½ feet.
 14. Red.
 15. A red ball at the masthead. Name on the sides of the vessel.
 16. One mast, 69 feet long; one lugsail, one staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 255 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 105 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Mushroom, 42 cwt.; best bower anchor, 14½ cwt.; spare ditto, 11 cwt.
 20. Brown, Lenox, and Co, Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Fixed; bright.
 25. Not revolving.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 16 burners.
 29. March 1859, 4 burners added by direction of the Board. No alteration in "character."
 30. William Wilkins and Co, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 59 days.
 34. 20 days.
 35. 2,978l. 2s. 6d.
 36. 3,853l. 1s., including fixtures for store room, but not lantern apparatus nor moorings.
 37. 39l. 7s. 3d. 1853, general repair, 715l. 10s. 1d.
 38. 11.
- | | | |
|----------------|----------|---|
| | £ s. d. | |
| 39. 1 master | - 5 0 0 | per mon: 1 suit uniform: 20l. per ann. house rent |
| 1 mate | - 4 0 0 | " " |
| 1 carpenter | - 2 17 0 | " " { At present an allowance of |
| 3 lamplighters | 2 12 0 | " " { 10 per cent. |
| 3 seamen | - 2 7 0 | " " { additional on |
| 2 " | - 2 9 6 | " " { wages. |
40. 301l. 2s. 6d., victualling allowance.
 41. 1s. 6d. per day per man.
 42. 575l. 14s. 9d.
 43. Lantern and fitting, 250l. 17s. 7d.; lamps and apparatus, 158l. 17s. 2d. Total, 406l. 14s. 9d.
 44. 1857, 11l. 13s. 9d. 1858, 11l. 4s. 9d.
 45. 1857, oil, 436 gallons; wicks, 100 dozen. 1858, oil, 447 gallons; wicks, 102 dozen.
 46. Rapeseed. 1857, imperial gallon, 9lbs., at 4s., 87l. 4s. 1858, ditto, at 3s. 3d., 79l. 12s. 9d.
 47. Argand cotton, at 2s. 6d. per gross. 1857, 1l. 0s. 10d. 1858, 1l. 3s. 3d.
 48. 2l. 13s.
 49. See Floating Lights, General Return, 20.
 50. Midsummer quarter, 1852, 1,808l. 5s. 1d. Ditto, 1858, 1,754l. 18s. 1d. Total for 1852, 7,415l. 10s. 4d.
 51. 1852, 827l. 8s. 5d. 1858, 1,020l. 10s. 3d. See Floating Lights, General Return, 20.
 52. April 1857, Sub-Collector, Chichester, that coasting vessels from the westward object to pay dues for the Owers, although they are payable under the consolidated table. A rule of the table makes all creeks and places to be regarded as included in the name of the port to which they severally belong, except where specially mentioned. Under this regulation Chichester, when a creek of Portsmouth, was exempt from this charge; but when transferred by the Customs to Arundel (of which place it is now considered a creek), it became technically liable. Under the circumstances the Board ordered the collector not to charge it on vessels to the westward, and gave directions for the insertion of a note to that effect in the next edition of the tables.
 53. 54. Nil. See Floating Lights, General Return, 20.
 55. Nil.
 56. July 1857, notice having been given of the intended alteration of the Owers lightvessel three-quarters of a mile in a S.S.W. ¾ W. direction, Mr. Biddlecombe, R.N., Keyham, suggested still greater alterations, viz., that of placing the vessel about S. 55° W. true 2½ miles from previous anchorage on the line of the leading mark through the Swatch. Receipt acknowledged; not considered desirable to adopt the suggestion.
 57. Nil.
 58. Committees of the Elder Brethren and by officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 60. 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 63. 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men are on shore in rotation. Relieved by sailing vessel.
 67. By sailing tender from East Cowes once a month.
 68. Yes, at Blackwall; as soon as she could be towed to the station.

* Since these returns were prepared the Trinity House have placed a Light Vessel to mark the Varue Shoal. First exhibited on the 1st October, 1860.

25.
CALSHOT.
Spit off Calshot Castle.

2. 3½ fathoms; mud; 1½ knots.
 4. Robert Willis, East Cowes.
 5. November 1825. Merchants and shipowners of Southampton and neighbourhood. See Floating Lights, General Return, 20.
 6. To guard the spit and to mark the entrance to Southampton Water.
 7. Since 16th May 1842.
 8. One only.
 9. Length, 67 feet; breadth, 18 feet.
 10. Wood.
 11. 100½ tons.
 12. Blackwall; Garrett and Westbrook.
 13. Forward, 6 feet 9 inches; aft, 7 feet 6 inches.
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. One mast, feet, 1 lugsail, 1 staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 60 fathoms ground chain between two anchors, with 100 fathoms bridle chain to centre ring. Ground tackle, two bower anchors, 80 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Two mooring anchors, single fluked, 15 and 16 cwt.; best bower anchor, 11 cwt.; spare ditto, 5½ cwt.
 20. Brown, Lenox, and Co.
 21. 31 feet.
 22. 6 miles.
 23. 9 miles.
 24. Revolving; bright.
 25. Once in four minutes, showing a flash every minute.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter.
 28. Four burners.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 37 days.
 34. 37 days.
 35. 1,453*l.* 8*s.*
 36. 2,056*l.* 11*s.* 4*d.*
 37. 36*l.* 0*s.* 1*d.* 1851, general repair, 1,440*l.* 1*s.* 11*d.*
 38. 11.
- | | | | | |
|-----------------|---|----|----|---|
| 39. 1 master | £ | s. | d. | |
| | - | 5 | 0 | 0 per mon.: 1 suit uniform: 20 <i>l.</i> per ann. house rent. |
| 1 mate | - | 4 | 0 | 0 " " |
| 3 lamp-lighters | - | 2 | 12 | 0 " " {At present an allowance of |
| 1 carpenter | - | 2 | 17 | 0 " " { 10 per cent. |
| 3 scamen | - | 2 | 7 | 0 " " { additional on |
| 2 " | - | 2 | 9 | 6 " " { wages. |
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. Cables, 353*l.* 3*s.*; anchors not known.
 43. 495*l.*, including revolving apparatus.
 44. 1857, 5*l.* 18*s.* 9*d.* 1858, 3*l.* 4*s.* 7*d.*
 45. 1857, oil, 156 gallons; wicks, 39 dozen. 1858, oil, 160 gallons; wicks, 39 dozen.
 46. Rapeseed. 1857, imperial gallon, 9 lbs., at 4*s.*, 31*l.* 4*s.* 1858, ditto at 3*s.* 3*d.*, 27*l.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 8*s.* 1½*d.* 1858, 8*s.* 1½*d.*
 48. 2*l.* 13*s.*
 49. See Floating Lights, General Return, 20.
 50. 1852, 317*l.* 6*s.* 0½*d.* 1858, 248*l.* 1*s.* 10*d.* Total for 1852, 1,142*l.* 8*s.* 4*d.*
 51. 1852, 783*l.* 8*s.* 4*d.* 1858, 820*l.* 13*s.* 10*d.* See Floating Lights, General Return, 20.
 52. 53, 54. Nil. See Floating Lights, General Return, 20.
 53. 56, 57. Nil.
 54. By Committees of Elder Brethren and officer in charge of monthly reliefs.
 55. At the time of effecting the monthly reliefs.
 56. 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation.
 67. By sailing tender from East Cowes once a month or less.
 68. Ycs, at Blackwall; as soon as she could be towed to the station.

26.
WARNER.

Eastern Part of the Shoal.

2. 13 fathoms; mud, broken shell, and gravel; 1½ knots.
 4. Robert Willis, East Cowes, Isle of Wight.
 5. October 1853 (for a light on the Kickergill), by James Main, pilot, per the Sub-Commissioners of Pilotage at Portsmouth. See Floating Lights, General Return, 20.
 6. To lead ships into Spithead between the Horse and Warner Sands.
 7. Since 1st May 1854.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 154½ tons.
 12. Great Yarmouth; Thomas Barber.
 13. Forward, 6 feet 5 inches; aft, 7 feet 4 inches.
 14. Red.
 15. Red ball at the masthead. Name on the sides of the vessel.
 16. One mast, 69 feet long, 1 lugsail, 1 staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms ground chain between two mushroom anchors, with 150 fathoms bridle chain to centre ring. Ground tackle, two bower anchors and 105 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Two mushroom anchors, 32 cwt. each; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Co., Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Revolving; bright.
 25. Once in four minutes, showing a flash every minute.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors 12 inches diameter. Clockwork revolving machine.
 28. Four burners.
 29. None.
 30. William Wilkins and Co., London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 32 days.
 34. 33 days.
 35. 1,641*l.* 16*s.* 6*d.*
 36. 2,808*l.* 5*s.* 4*d.*
 37. 59*l.* 6*s.* 6*d.*, since 1854. 1851, general repair, 1,442*l.* 6*s.* 11*d.*, after leaving St. Nicholas Gatt.
 38. 11.
- | | | | | |
|-----------------|---|----|----|---|
| 39. 1 master | £ | s. | d. | |
| | - | 5 | 0 | 0 per mon.: 1 suit uniform: 20 <i>l.</i> per ann. house rent. |
| 1 mate | - | 4 | 0 | 0 " " |
| 3 lamp-lighters | - | 2 | 12 | 0 " " {At present an allowance of |
| 1 carpenter | - | 2 | 17 | 0 " " { 10 per cent. |
| 1 seaman | - | 2 | 7 | 0 " " { additional on |
| 4 " | - | 2 | 9 | 6 " " { wages. |
40. 201*l.* 2*s.* 6*d.*, victualling allowance.
 41. 1*s.* 6*d.* per day per man.
 42. 739*l.* 8*s.* 10*d.*
 43. Apparatus not new.
 44. 1857, 8*l.* 18*s.* 11*d.* 1858, 6*l.* 14*s.* 1*d.*
 45. 1857, oil, 158 gallons; wicks, 75 dozen. 1858, oil, 157 gallons; wicks, 74 dozen.
 46. Rapeseed. 1857, imperial gallon, 9 lbs., at 4*s.*, 31*l.* 12*s.* 1858, ditto at 3*s.* 3*d.*, 23*l.* 10*s.* 3*d.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 15*s.* 7½*d.* 1858, 15*s.* 5*d.*
 48. 2*l.* 13*s.*
 49. See Floating Lights, General Return, 20.
 50. No revenue.
 51. 1852, not in position. 1858, 825*l.* 0*s.* 11*d.* See Floating Lights, General Return, 20.
 52. 53, 54. Nil. See Floating Lights, General Return, 20.
 53. 56, 57. Nil.
 54. By Committees of Elder Brethren and officer in charge of the monthly reliefs.
 55. At the time of effecting the monthly reliefs.
 56. 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation.
 67. By sailing tender from East Cowes once a month or oftener.
 68. Ycs, at Blackwall; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE LONDON.

27.

BEMBRIDGE.

Off the Point of Bembridge Ledge, near the Nab Rock.

2. 5 fathoms; hard, with small pebbles; 2 knots.
4. Mr. Robert Willis, East Coves, Isle of Wight. See Floating Lights, General Return, 20.
5. No application; established by the Government, and transferred to the Corporation, under Act 6 & 7 Will. 4. c. 79.
6. To clear the dangers to eastward of the Isle of Wight; to lead to St. Helen's Road and Spithead.
7. Since 29th September 1812.
8. Two; unequal heights.
9. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 156 $\frac{1}{2}$ tons.
12. Great Yarmouth, Thomas Barber.
13. Forward, 6 feet 6 inches; aft, 8 feet.
14. Red.
15. Red ball at each masthead. Name on the sides of the vessel.
16. Two masts, one 69 feet, one 60 feet; one lugsail; one stay-sail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 165 fathoms ground chain between two mushroom anchors, with 165 fathoms bridle chain to centre ring. Ground tackle, two bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain $1\frac{1}{2}$ inch iron; two mushroom, 44 cwt. and 34 cwt. respectively; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
20. Brown, Lenox, and Co.
21. Upper, 38 feet; lower, 28 feet.
22. Upper, 6 $\frac{1}{2}$ miles; lower, 5 $\frac{1}{2}$ miles.
23. Both ten.
24. Both fixed and bright.
25. Both stationary.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors 12 inches diameter.
28. 16 burners, 8 in each lantern.
29. None.
30. Robert Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
33. 26 days.
34. 26 days.
35. 1,971*l.* 18*s.*
36. 2,973*l.* 18*s.* 8*d.*
37. 57*l.* 18*s.* 11*d.* 1851, general repair, 1,581*l.* 3*s.* 1857, ditto, 417*l.* 16*s.* 10*d.*
38. 11.
39. 1 master - $\frac{£}{5}$ $\frac{s.}{0}$ $\frac{d.}{0}$ per mon. . 1 suit uniform : 20*l.* per ann. house rent.

1 mate	- 4	0	0	"	}	At present an allowance of 10 per cent. additional on wages.
3 lamp-lighters	2	12	0	"		
1 carpenter	2	12	0	"		
1 seaman	- 2	7	0	"		
4 "	- 2	9	6	"	"	"
40. 301*l.* 2*s.* 6*d.*
41. 1*s.* 6*d.* per day per man.
42. 792*l.* 0*s.* 5*d.*
43. Apparatus not new.
44. 1857, 8*l.* 18*s.* 11*d.* 1858, 6*l.* 14*s.* 1*d.*
45. 1857, oil, 677 gallons; wicks, 125 dozen. 1858, oil, 709 gallons; wicks, 112 dozen.
46. Rapeseed. 1857, imperial gallon, 9 lbs., at 4*s.*, 135*l.* 8*s.* 1858, ditto, at 4*s.* 3*d.*, 114*l.* 14*s.* 7*d.*
47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 1*l.* 6*s.* 0 $\frac{1}{2}$ *d.* 1858, 1*l.* 3*s.* 4*d.*
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
50. No toll. See Owers.
51. See Floating Lights, General Return, 20.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
58. Committees of Elder Brethren and officer in charge of the monthly reliefs.
59. At the time of effecting the monthly reliefs.
60. 6*l.* No.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation.
67. By sailing tender from East Coves once a month or oftener.
68. Yes, at Blackwall; as soon as she could be towed to the station.

28.

SHAMBLES.

East End of the Shoal.

2. 15 fathoms; broken shells and coarse sand; 3 $\frac{1}{2}$ knots.
4. Robert Willis, East Coves, Isle of Wight.
5. No application. Proposed by an Inspecting Committee of the Elder Brethren in 1859.
6. To mark approach to Portland Harbour of Refuge, and clear east end of shoal.
7. Since 1st September 1859.
8. One only.
8. Length, extreme, 80 feet; breadth, 21 feet.
10. Wood.
11. 162 $\frac{1}{2}$ tons.
12. Blackwall; William Pitcher.
13. Forward, 6 feet 6 inches; aft, 7 feet 6 inches.
14. Red.
15. Red ball at the masthead. Name on the sides of the vessel.
16. One mast, 69 feet long; one lugsail; one staysail.
17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, 2 bower anchors and 105 fathoms chain.
19. Patent proved short-linked chain $1\frac{1}{2}$ inch iron; mushroom, 40 cwt.; best bower anchor, 20 cwt.; sp.-rc ditto, 14 cwt.
20. Brown, Lenox, and Co., Millwall.
21. 38 feet.
22. 6 $\frac{1}{2}$ miles.
23. 10 miles.
24. Fixed; bright.
25. Stationary.
26. See Floating Lights, General Return, 20.
27. Catoptric. Argand lamps, burners $\frac{1}{2}$ of an inch, and parabolic reflectors of 12 inches diameter.
28. Eight burners.
29. None.
30. William Wilkins and Son, London.
31. See Floating Lights, General Return, 20.
32. Gong.
- 33, 34. Not in position until 1859.
35. 3,128*l.* 8*s.*
36. 4,281*l.* 4*s.* 4*d.*
37. Not in position until 1859.
38. 11.
39. 1 master - $\frac{£}{5}$ $\frac{s.}{0}$ $\frac{d.}{0}$ per mon. : 1 suit uniform : 20*l.* per ann. house rent.

1 mate	- 4	0	0	"	}	At present an allowance of 10 per cent. additional on wages.
3 lamp-lighters	2	12	0	"		
1 carpenter	- 2	12	0	"		
5 seamen	- 2	7	0	"		
40. 301*l.* 2*s.* 6*d.*, victualling allowance.
41. 1*s.* 6*d.* per day per man.
42. 524*l.* 0*s.* 2*d.*
43. Apparatus not new.
- 44, 45, 46, 47. Not in position until 1859.
48. 2*l.* 13*s.*
49. See Floating Lights, General Return, 20.
- 50, 51. Not in position until 1859.
- 52, 53, 54. Nil. See Floating Lights, General Return, 20.
- 55, 56, 57. Nil.
- 58, 59, 60, 61. Not in position until 1859.
62. Aneroid barometer, with thermometer attached, and three compasses.
- 63, 64, 65. See Floating Lights, General Return, 20.
66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation.
67. By steamers once a month, from Weymouth, bid.
68. Yes, at Blackwall; as soon as she could be towed to the station.

29.
SEVEN STONES.
East Side of the Rocks, between Scilly Isles
and Land's End.

2. 40 fathoms; slate and sand; about 2½ knots.
 4. Hugh Tregarthen, Tresco, Scilly.
 5. July 1826, by certain masters of vessels and others. Renewed December 1839, by the Chamber of Commerce of Waterford, and the trade of Liverpool and ports in the Bristol Channel and Ireland.
 6. To mark the Seven Stones rocks.
 7. Since 1st September 1841.
 8. Two; unequal heights.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 162½ tons.
 12. Blackwall; William Pitcher.
 13. Forward, 6 feet 6 inches; aft, 8 feet.
 14. Red.
 15. Red ball at each masthead. Name on the sides of the vessel.
 16. Two masts, one 69 feet, one 60 feet; one lugsail; one staysail; one jib.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 315 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors, two cables of 210 fathoms and 150 fathoms respectively.
 19. Patent proved short-linked chain ½ inch iron; mushroom, 40 cwt.; best bower anchor, 20 cwt.; spare ditto, 16 cwt.
 20. Brown, Lenox, and Company, Millwall.
 21. Upper, 38 feet; lower, 20 feet.
 22. Upper, 6½ miles; lower, 4½ miles.
 23. Both ten miles.
 24. Both fixed and bright.
 25. Both stationary.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 16 burners, 8 in each lantern.
 29. None.
 30. Robert Wilkins and Company, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 10 days.
 34. 12 days.
 35. 3,128*l.* 8*s.*
 36. 4,416*l.* 8*s.* 7*d.*
 37. 12*l.* 2*s.* 4*d.* 1853, general repair, 2,272*l.* 14*s.* 4*d.*
 38. 17.
- | | | | | |
|----------------|---|----|----|---|
| | £ | s. | d. | |
| 39. 1 master | - | 5 | 0 | 0 per mon.: 1 suit uniform; 20 <i>l.</i> per ann. house rent. |
| 1 mate | - | 4 | 0 | " " " " " " |
| 3 lamplighters | - | 2 | 15 | " " " " " " |
| 1 carpenter | - | 3 | 0 | " " " " " " |
| 8 seamen | - | 2 | 10 | " " " " " " |
| 8 " | - | 2 | 12 | " " " " " " |
| 8 " | - | 2 | 12 | " " " " " " |
- { At present an allowance of 10 per cent. additional on wages.
40. 465*l.* 7*s.* 6*d.*
 41. 1*s.* 6*d.* per day per man.
 42. 998*l.* 4*s.* 5*d.*
 43. 926*l.* 18*s.* 5*d.*
 44. 1857, 12*l.* 5*s.* 10*d.* 1858, 11*l.* 15*s.* 7*d.*
 45. 1857, oil, 539 gallons; wicks, 252 dozen. 1858, oil, 517 gallons; wicks, 251 dozen.
 46. Rapeseed. 1857, imperial gallon, 9*lbs.*, at 4*s.* per gallon, 107*l.* 16*s.* 1858, ditto, at 3*s.* 3*d.* per gallon, 84*l.* 0*s.* 3*d.*
 47. Argand cotton, 2*s.* 6*d.* per gross. 1857 12*l.* 2*s.* 6*d.* 1858, 2*l.* 12*s.* 3*d.*
 48. 2*l.* 18*s.*
 49. See Floating Lights, General Return, 20.
 50. 1852, 512*l.* 0*s.* 6*d.* 1858, 496*l.* 5*s.* Total for 1852, 1,890*l.* 18*s.* 6*d.*
 51. 1852, 1,392*l.* 5*s.* 5*d.* 1858, 2,448*l.* 10*s.* 7*d.* See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of the Elder Brethren and by officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and twelve men are always on board; the master or mate and three men on shore in rotation.
 67. By sailing tender from Isle of Tresco once a month.
 68. Yes, at Blackwall or Milford; as soon as she could be towed to the station.

30.
ENGLISH and WELSH GROUNDS.
South Side of the Bristol Channel.

2. 4½ fathoms; sand and mud; ¾ knots.
 4. B. H. Bailey, Milford.
 5. November 1834, by trade of principal ports in Bristol Channel (except Gloucester), and merchant venturers and Chamber of Commerce, Bristol. See Floating Lights, General Return, 20.
 6. For navigating the eastern part of the Bristol Channel from Flatholm to King Road.
 7. Since 1st September 1838.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 158½ tons.
 12. Great Yarmouth; Thomas Barber.
 13. About 7 feet forward; 5 feet aft.
 14. Red.
 15. A red ball at the masthead. Name on the sides of the vessel.
 16. One mast, 69 feet; one lugsail, one staysail.
 17. Wire rod above the masthead, connected by metal plates to the chain rigging, and copper bands down the sides to the water.
 18. Moored by 150 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors, 100 fathoms chain.
 19. Patent proved short-linked chain ½ inch iron; mushroom anchor, 34 cwt.; two bower anchors, 20 cwt. each.
 20. Brown, Lenox, and Company.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Revolving; bright.
 25. Once in four minutes, showing a flash every minute.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners 1 of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine.
 28. Four burners.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 24 days.
 34. 24 days.
 35. 1,990*l.* 1*s.*
 36. 3,182*l.* 1*s.* 10*d.*
 37. 46*l.* 5*s.* 11*d.* 1854, general repair, 1,334*l.* 19*s.* 9*d.*
 38. 11.
- | | | | | |
|----------------|---|----|----|---|
| | £ | s. | d. | |
| 39. 1 master | - | 5 | 0 | 0 per mon.: 1 suit uniform; 20 <i>l.</i> per ann. house rent. |
| 1 mate | - | 4 | 0 | " " " " " " |
| 3 lamplighters | - | 2 | 12 | " " " " " " |
| 6 seamen | - | 2 | 9 | " " " " " " |
- { At present an allowance of 10 per cent. additional on wages.
40. 801*l.* 2*s.* 6*d.*
 41. 1*s.* 6*d.* per day per man.
 42. 427*l.* 5*s.* 5*d.*
 43. 638*l.* 8*s.* 10*d.*, including revolving apparatus.
 44. 1857, 9*l.* 8*s.* 6*d.* 1858, 8*l.* 2*s.* 2*d.*
 45. 1857, oil, 172 gallons; wicks, 85 dozen. 1858, oil, 179 gallons; wicks, 74 dozen.
 46. Rapeseed. 1857, imperial gallon, 9*lbs.*, at 4*s.* per gallon, 34*l.* 8*s.* 1858, ditto, at 3*s.* 3*d.* per gallon, 29*l.* 1*s.* 9*d.*
 47. Argand cotton, at 2*s.* 6*d.* per gross. 1857, 17*s.* 8*d.* 1858, 15*s.* 5*d.*
 48. 2*l.* 13*s.*
 49. See Floating Light, General Return, 20.
 50. 1852, 632*l.* 8*s.* 4½*d.* 1858, 634*l.* 17*s.* 11*d.* Total for 1852, 2,529*l.* 14*s.* 1*d.* Includes Avon Light and the Bristol Channel Buoys.
 51. 1852, 1,068*l.* 15*s.* 1*d.* 1858, 858*l.* 19*s.* 10*d.* See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of the Elder Brethren, and officer in charge of monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 - 60, 61. No.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by sailing vessel.
 67. Sailing tender from Cardiff once a month.
 68. Yes, at Milford; as soon as she could be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

31.

HELWICKS.

On the West End of the Sand off Worm's End.

2. 15 fathoms; sand and mud; 2½ knots.
 4. B. H. Bailey, Milford.
 5. 1845, town council and trade of Carmarthen, and the principal ports in the Bristol Channel, Chamber of Commerce and Steam Navigation Companies at Bristol.
 6. To mark the west end of Helwicks Sand.
 7. Since 1st October 1846.
 8. One only.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 158½ tons.
 12. Northfleet; William Pitcher.
 13. About seven feet forward and eight feet aft.
 14. Red.
 15. Red ball at masthead. Name on sides of the vessel.
 16. One mast, 69 feet long; one lugsail; one staysail.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 150 fathoms chain.
 19. Patent proved short-linked chain 1½ inch iron. Mushroom about 36 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Company, Millwall.
 21. 38 feet.
 22. 6½ miles.
 23. 10 miles.
 24. Revolving; bright.
 25. Once in four minutes, showing the full face of a reflector every minute.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter. Clockwork revolving machine.
 28. Four burners.
 29. None.
 30. Robert Wilkins and Son, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 22 days.
 34. 25 days.
 35. 2,677l. 17s. 3d.
 36. 3,476l. 16s. 5d.
 37. 76l. 13s. 4d. 1853, general repair, 639l. 18s. 9d.
 38. 11.
- | | | | | | | | | |
|----------------|---|---|----|----|---|---|---|---|
| 39. 1 master | - | £ | s. | d. | 0 | 0 | 0 | per mon.: 1 suit uniform: 20l. per ann. |
| 1 mate | - | 4 | 0 | 0 | " | " | " | house rent. |
| 3 lamplighters | - | 2 | 14 | 6 | " | " | " | { At present an allowance of |
| 1 carpenter | - | 2 | 17 | 0 | " | " | " | { 10 per cent. |
| 5 seamen | - | 2 | 9 | 6 | " | " | " | { additional on wages. |
40. 301l. 2s. 6d., victualling allowance.
 41. 1s. 6d. per day per man.
 42. 467l. 1s. 1d.
 43. 398l. 10s.
 44. 1857, 6l. 15s. 2d. 1858, 5l. 19s. 11d.
 45. 1857, oil, 149 gallons; wicks, 59 dozen. 1858, oil, 152 gallons; wicks, 58 dozen.
 46. Rapeseed. 1857, imperial gallon, 9 lbs., at 4s., 29l. 16s. 1858, ditto at 3s. 3d., 24l. 14s.
 47. Argand cotton at 2s. 6d. per gross. 1857, 12s. 3½d. 1858, 12s. 1d.
 48. 2l. 13s.
 49. See Floating Lights, General Return, 20.
 50. Midsummer quarter, 1852, 362l. 18s. 11½d. Ditto, 1858, 270l. 10s. 1d. Total for 1852, 1,198l. 12s. 2½d.
 51. 1852, 863l. 2s. 2d. 1858, 890l. 2s. 1d. See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of Elder Brethren and by the officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly reliefs.
 60. No.
 61. 1857, 3rd to 14th January, drove in storm of 3rd January, nearly 11 days.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation. Relieved by steam vessel or by hired pilot smack.
 67. By steamer or by hired pilot smack in absence of steamer.
 68. Yes, at Milford; as soon as she can be towed to the station.

32.

CARDIGAN BAY.

Between the South Bishop and Bardsey Island Lighthouses.

2. Vessel not yet placed.
 4. B. H. Bailey, Milford.
 5. July 1825, Captain George Gosling, of H.M.S. "Harrier;" renewed March 1825 by the trade of Cardigan, Pwllheli, Portmadoc, Aberayron, Barmouth, Aberdovey, and Carnarvon.
 6. To facilitate navigation of St. George's Channel, and to indicate their position to vessels that may be influenced by the draught into Cardigan Bay.
 7. To be in position about 1st July 1860.
 8. One only.
 9. Length, extreme, 91 feet; breadth, 21 feet.
 10. Iron.
 11. 183½ tons.
 12. Liverpool; Thomas Vernon and Son.
 13. About 8 feet 4 inches aft; 8 feet forward.
 14. Red.
 15. A red ball at the masthead. Name on the sides of the vessel.
 16. One mast, 69 feet long; one lugsail; one staysail.
 17. Wire rod above the masthead, connected by metal bands to the chain rigging.
 18. Moored by 300 fathoms riding chain to a mushroom anchor. Ground tackle, 2 bower anchors and 2 cables of 150 fathoms each.
 19. Patent proved short-linked chain 1½ inch iron; 1 mushroom, 40 cwt.; 1 bower anchor, 50 cwt.; 1 ditto, 14 cwt.
 20. Brown, Lenox, and Co.
 21. 25 feet.
 22. 5½ miles.
 23. About 9 miles.
 24. Revolving; red.
 25. Once in 1½ minutes, showing a flash every 30 seconds.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners ½ of an inch, and parabolic reflectors of 12 inches diameter; red shades on the reflectors. Clockwork revolving machine.
 28. 9 burners.
 29. None.
 30. William Wilkins and Co., London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. Not in use.
 34. Vessel not in position.
 35. 3,750l.
 36. Accounts not yet received.
 37. Vessel not in position.
 38. 11.
- | | | | | | | | | |
|----------------|---|---|----|----|---|---|---|---|
| 39. 1 master | - | £ | s. | d. | 0 | 0 | 0 | per mon.: 1 suit uniform: 20l. per ann. |
| 1 mate | - | 4 | 0 | 0 | " | " | " | house rent. |
| 3 lamplighters | - | 2 | 17 | 0 | " | " | " | { At present an allowance of |
| 1 carpenter | - | 2 | 12 | 0 | " | " | " | { 10 per cent. |
| 5 seamen | - | 2 | 7 | 0 | " | " | " | { additional on wages. |
40. 301l. 2s. 6d.
 41. 1s. 6d. per man per day.
 42. 798l. 13s. 6d.
 43. 479l. 12s.
 - 44, 45, 46, 47. Not placed until 1860.
 48. 2l. 13s.
 49. See Floating Lights, General Return, 20.
 - 50, 51. Nil.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 - 59, 60, 61. Not yet placed.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64, 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and 6 men are always on board; the master or mate and 3 men on shore in rotation. Relieved by steam vessel.
 67. By steamer (or hired sailing vessel in steamer's absence) from Milford once a month.
 68. Yes, at Milford; so soon as can be towed to the station.

CORPORATION OF TRINITY HOUSE, LONDON.

33.

BAHAMA BANK.

Off the South-east Tail of the Shoal (Isle of Man).

2. 11 fathoms; sand and gravel; $2\frac{1}{2}$ knots.
 4. B. H. Bailey, Milford, Pembrokeshire.
 5. March 1835, by the trade of Whitehaven (per the Collector of Customs); renewed in December 1846, by trade from Liverpool and Fleetwood, &c., to Glasgow and ports in Scotland (per Robert Lamont, of Liverpool). See Floating Lights, General Return, 20.
 6. To mark the south-east end of the bank.
 7. Since 1st January 1848.
 8. Two; unequal heights.
 9. Length, extreme, 80 feet; breadth, 21 feet.
 10. Wood.
 11. 161 tons.
 12. Bristol; Charles Hill and Sons.
 13. About 7 feet forward and 8 feet aft.
 14. Red.
 15. A red ball at each masthead. Name on sides of the vessel.
 16. 1 mast 69 feet; 1 ditto, 60 feet; 2 lugsails; and 2 staysails.
 17. Wire rod above the masthead, connected by metal plates to chain rigging, and copper bands down the sides to the water.
 18. Moored by 210 fathoms riding chain to a mushroom anchor. Ground tackle, two bower anchors and 130 fathoms chain.
 19. Patent proved short-linked chain $1\frac{1}{2}$ inch iron. Mushroom, 42 cwt.; best bower anchor, 20 cwt.; spare ditto, 14 cwt.
 20. Brown, Lenox, and Company, Millwall.
 21. Upper light, 33 feet; lower light, 20 feet.
 22. Upper, $6\frac{1}{2}$ miles; lower, $4\frac{1}{2}$ miles.
 23. Both 10 miles.
 24. Both fixed and bright.
 25. Both stationary.
 26. See Floating Lights, General Return, 20.
 27. Catoptric. Argand lamps, burners $\frac{3}{4}$ of an inch, and parabolic reflectors of 12 inches diameter.
 28. 16 burners, 8 in each lantern.
 29. None.
 30. William Wilkins, London.
 31. See Floating Lights, General Return, 20.
 32. Gong.
 33. 20 days.
 34. 20 days.
 35. 2,737*l*.
 36. 3,557*l*. 19*s*. 8*d*.
 37. 109*l*. 12*s*. 7*d*. 1858, general repair.
 38. 11.
- | | <i>£</i> | <i>s</i> . | <i>d</i> . | |
|-----------------|----------|------------|------------|--|
| 39. 1 master | - | 5 | 0 | per month: 1 suit uniform: 20 <i>l</i> . per annum house rent. |
| 1 mate | - | 4 | 0 | At present an allowance of 10 per cent. additional wages. |
| 3 lamp-lighters | 2 | 12 | 0 | " " " " " " |
| 1 carpenter | - | 2 | 17 | " " " " " " |
| 5 seamen | - | 2 | 7 | " " " " " " |
40. 301*l*. 2*s*. 6*d*., victualling allowance.
 41. 1*s*. 6*d*. per man per day.
 42. 460*l*. 14*s*. 2*d*.
 43. Apparatus not new; alteration, 317*l*. 16*s*. 10*d*.
 44. 1857, 13*l*. 9*s*. 7*d*. 1858, 14*l*. 1*s*. 4*d*.
 45. For both lights: 1857, oil, 576 gallons; wicks, 211 dozen. 1858, oil, 580 gallons; wicks, 211 dozen.
 46. Rapeseed. 1857, 4*s*., cost, 115*l*. 4*s*. 1858, 3*s*. 3*d*., cost, 94*l*. 5*s*.
 47. Argand cotton, 2*s*. 6*d*. per gross. 1857, 2*l*. 3*s*. 11½*d*.; 1858, 2*l*. 3*s*. 11½*d*., for both lights.
 48. 2*l*. 13*s*.
 49. See Floating Lights, General Return, 20.
 50. Midsummer quarter, 1852, 182*l*. 16*s*. 1½*d*. Ditto, 1858, 75*l*. 8*s*. 1*d*. Total for 1852, 514*l*. 1*s*. 10½*d*.
 51. 1852, 1,011*l*. 12*s*. 8*d*. 1858, 1,383*l*. 11*s*. 4*d*. See Floating Lights, General Return, 20.
 - 52, 53, 54. Nil. See Floating Lights, General Return, 20.
 - 55, 56, 57. Nil.
 58. By Committees of the Elder Brethren and officer in charge of the monthly reliefs.
 59. At the time of effecting the monthly relief.
 60. No.
 61. 1853, 18th to 24th January, vessel drove about $1\frac{1}{2}$ cables about 6 days. 1858, 12th February, vessel drove about a cable's length, one day.
 62. Aneroid barometer, with thermometer attached, and three compasses.
 - 63, 64. 65. See Floating Lights, General Return, 20.
 66. Once a month. The master or mate and six men are always on board; the master or mate and three men on shore in rotation.* Relieved by sailing tender from Ramsey.
 67. By hired smack from Ramsey, Isle of Man.
 68. Yes, at Milford; as soon as she could be towed to the station.

CIRCULAR NO. V.—BUOYS AND BEACONS.

I. The Corporation of Trinity House of Deptford Strond, Trinity House, London, E.C.

Charts were furnished.

II.

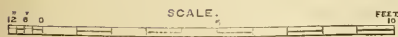
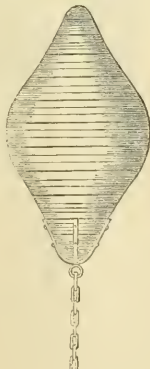
II.

	Cost of Maintenance.		Income.		
	1852.	1858.	1852.	Midsummer 1852.	Midsummer 1858.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Tees - - - - -	338 5 2	474 0 1	1,009 4 6	261 0 0	199 17 8
Coquet - - - - -	1 13 0	91 0 7	Nil; chargeable on Coquet lighthouse revenue.		
Yarmouth - - - - -	1,027 4 1	1,652 12 2	3,333 6 1½	787 16 8	643 0 8
Harwich - - - - -	480 5 10	366 1 1	Nil; chargeable on Sunk lightvessel revenue.		
Woodbridge - - - - -	32 18 1	37 7 5	30 16 0	6 13 0	5 8 4
Thames (buoyage and beaconage)	2,810 12 9	1,490 2 10	14,442 10 11½	3,425 6 6½	2,835 14 0
Ramsgate - - - - -	168 5 5	368 4 6	Nil; chargeable on Goodwin lightvessel revenue.		
Looe Stream - - - - -	4 13 2	12 0 1	Nil; chargeable on Owers lightvessel revenue.		
Plymouth - - - - -	Included in buoyage and beaconage.	43 6 3	Nil; chargeable on Eddystone lighthouse revenue.		
Exmouth - - - - -	109 14 5	36 19 9	143 8 6	41 19 10½	26 14 9
B'deford - - - - -	55 0 3	106 2 9	Nil.		
Usk - - - - -	4 19 0	24 11 2	Nil.		
Eristol Channel - - - - -	1,102 8 7	1,085 11 5	Included in income for Bristol Channel lightvessel.		
St. George's Channel - - - - -	48 11 7	224 10 8	Nil.		
Conway - - - - -	128 5 1	119 14 7	28 16 7½	8 13 4	6 7 7
Carmarthen - - - - -	152 15 6	105 13 10	136 0 6	38 2 4½	17 9 9
Aberdovey - - - - -	35 11 3	20 6 11	26 19 2	10 2 7½	5 18 3
Dee - - - - -	526 7 7	564 8 8	Included in income for Air lighthouse.		
Heligoland - - - - -	—	28 19 10	Nil; chargeable on Heligoland lighthouse revenue.		

III. See Section 389 to 395 Merchant Shipping Act, 1854, 17 & 18 Vict. c. 104.
IV. See Sections 389 to 395 Merchant Shipping Act, 1854, 17 & 18 Vict. c. 104.

V.

NUN BUOYS.—(Used also for WRECK BUOYS.)

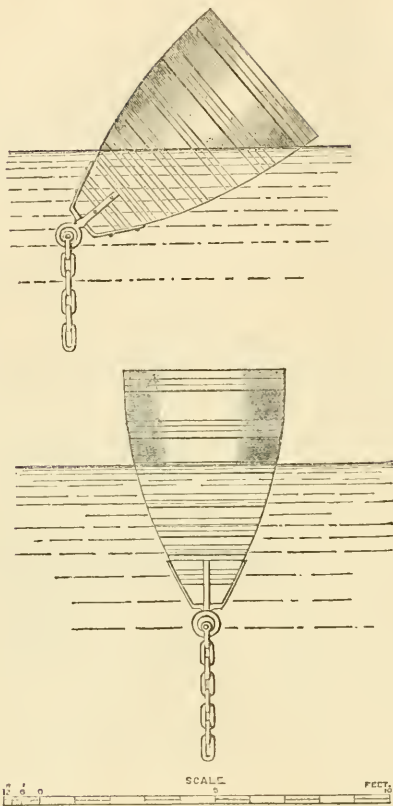


a. 4 feet, wood; 5 feet, wood; 6 feet, wood; 7 feet, wood; 7½ feet, wood.

- b. 4 feet, 9l.; 6 feet, 10l.
- c. See return for Can buoys.
- d. See return for Can buoys.
- e. 4 feet, seven; 5 feet, two; 6 feet, eight; 7 feet, two; 7½ feet, two.
- f. 4 feet, two; 5 feet, nil; 6 feet, nine; 7 feet, five; 7½ feet, nil.
- g. 4 feet, at Conway; 5 feet, nil; 6 feet, two at Conway, one at Aberdovey, two at Holyhead, one at Cardiff, two at Carmarthen, one at Seaton Carew; 7 feet, two at Woodbridge, two at Blackwall, one at Harwich; 7½ feet, nil.
- h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable, and in sufficient quantity for any casualty that may occur.
- i. Nil.
- j. Nil.
- k. By single chain and sinker or mushroom.
- l. Varies according to extent of chain required, by nature of holding ground and character of water. The prices of buoy chains, &c., delivered in London, were, in 1859,—
 - 1½ in. (71 lbs. to the fathom) - 20s. per cwt.
 - 1¾ in. - 22s. "
 - 2 in. - 23s. "
 - 2½ and 3 in. - 12s. 9d.
 - Cast-iron mushrooms - 9s. 6d. "
 - Sinkers - 9s. 6d. "
- m. See return for Can buoys.
- n. See details at "b" and "e." Names are also painted in large letters on the buoys.
- o. See answer to "e."

ENGLAND. V.
Circular V.

CAN BUOYS.



- a. 4 feet, wood ; 5 feet, wood ; 6 feet, wood ; 7 feet, wood ; 8 feet, wood.
- b. Plain:—4 feet, 14l. 7s. 3d. ; 5 feet 22l. 8s. 6d. ; 6 feet, 27l. 10s. 9d. ; 7 feet, 25l. 10s. 3d. ; 8 feet, 28l. 1s. 6d. Staff and globe:—6 feet, 6l. 17s. 3d. ; 7 feet, hooped, 32l. 10s. 3d. ; screwed, 8l. 12s. 3d. ; 8 feet, hooped, 36l. 1s. 6d. ; screwed, 8l. 12s. 3d.
- c and d. No average can be given for each buoy. When repaired, the cost varies from 2l. to 6l., according to damage incurred, or exposed position. Painting is done by the men off duty from the lightvessels, the paint being supplied from the store.
- e. 4 feet, 10 ; 5 feet, 13 ; 6 feet, 8l plain, 2 staff and globe ; 7 feet, 9d plain, 1 staff and globe ; 8 feet, 66 plain, 13 staff and globe.
- f. 4 feet, 15 ; 5 feet, 15 ; 6 feet, 12d ; 7 feet, 10d ; 8 feet, 10d.

Port	4 Feet.	5 Feet.	6 Feet.	7 Feet.	8 Feet.
Exmouth	10	—	10	—	—
Blackwall	—	—	53	39	19
Harwich	—	—	4	12	5
Ramsgate	—	—	4	10	—
Plymouth	—	—	1	1	—
Coquet	—	—	8	—	—
Cowes	—	—	2	1	2
Yarmouth	—	—	10	26	29
Scilly (Tresco)	—	—	—	—	1
Bideford	—	—	6	1	—
Cardiff	—	—	9	3	27
Cardmarthen	—	—	—	6	—
Milford	—	—	1	1	—
Aberdorey	—	—	1	—	—
Holyhead	—	—	1	—	1
Conway	—	2	5	—	3
Hilbre I. (Dec)	3	13	9	5	1
Fleetwood	—	—	—	—	1
Ramsay, I. of Man	—	—	—	—	—
Total	15	15	124	104	100

BUOYS AND BEACONS.

V.

h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable, and in sufficient quantity, for any casualty that may occur.

4 feet, nil ; 5 feet, one ; 6 feet, six ; 7 feet, 16 ; 8 feet 13.

j. 4 feet, nil ; 5 feet, run foul of by vessel ; 6 feet, five fouled, one cause not known ; 7 feet, five broke adrift, five fouled and sunk, five fouled and waterlogged, one chain broke ; 8 feet, seven fouled, three fouled and waterlogged, three broke adrift.

k. By single chain and sinker or mushroom, and, in several instances, with double moorings.

l. Varies according to extent of chain required, by nature of holding ground and character of water. The prices of buoy chains, &c., delivered in London, were, in 1859,—

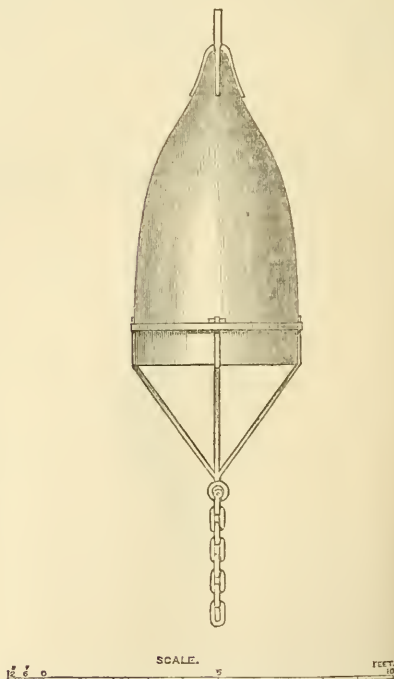
1 1/2 in. (71 lbs. to the fathom)	-	20s. per cwt.
1 5/8 "	-	22s. "
1 3/4 " and 7/8 in.	-	23s. "
Cast-iron mushrooms	-	12s. 9d. "
Sinkers	-	9s. 6d. "

m. Chiefly procured of one firm, in London, Messrs. Shuter and Co., Shad Thames, at agreed prices. Chains and sinkers are supplied by Messrs. Lenox. The chains of lightvessels are also converted into buoy chains after three years' wear.

n. See details at "b" and "e." Names are also painted in large letters on the buoys.

o. See answer to "e."

CAN REVERSED BUOYS.



- a. Eight feet, wood.
- b. Spiral, 50l. ; staff and globe, 8l. 12s. 3d
- c. See return for Can buoys.

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- d. See return for Can buoys.
- e. 1 spiral and 11 staff and globe.
- f. Fourteen.
- g. 2 at Blackwall, 6 Yarmouth, 4 Ramsgate, 1 Exmouth, and 1 Milford.
- h. See answer to *f*. Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
- i. Five.
- j. 2 collision, 2 broke adrift, 1 waterlogged by fouling.
- k. By single chain and sinker or mushroom, and in two or three instances with double moorings.
- l. Varies according to extent of chain required by nature of holding ground and character of water.

prices of buoy chains, &c. delivered in London were, in 1859,—

1½ in. (71 lbs. to the fathom) -	20s. per cwt.
1¾ in. -	22s. "
2 in. -	23s. "
2 and ½ in. -	12s. 9d. "
Cast-iron mushrooms -	9s. 6d. "
Sinkers -	-

Circular V.

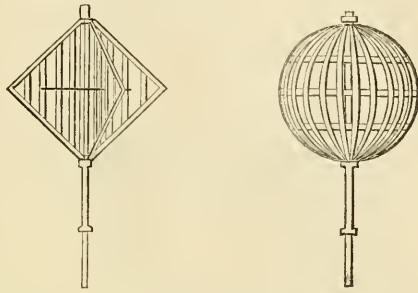
The prices of buoy chains, &c. delivered in London were, in 1859,—

1½ in. (71 lbs. to the fathom) -	20s. per cwt.
1¾ in. -	22s. "
2 in. -	23s. "
2 and ½ in. -	12s. 9d. "
Cast-iron mushrooms -	9s. 6a. "
Sinkers -	-

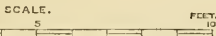
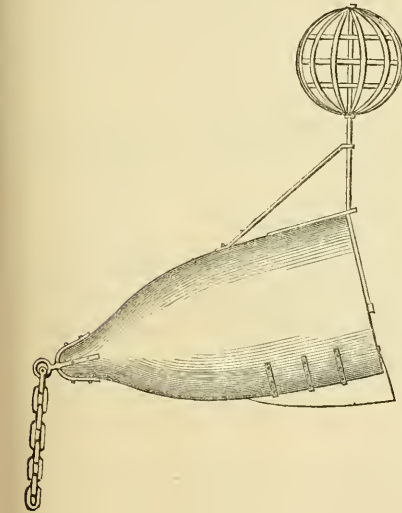
- m. See return for Can buoys.
- n. See details at *b* and *e*. Names are also painted in large letters on the buoys.
- o. See answer to *e*.

- m. See return for Can buoys.
- n. See details at "b" and "e." Names are also painted in large letters on the buoys.
- o. See answer to "e."

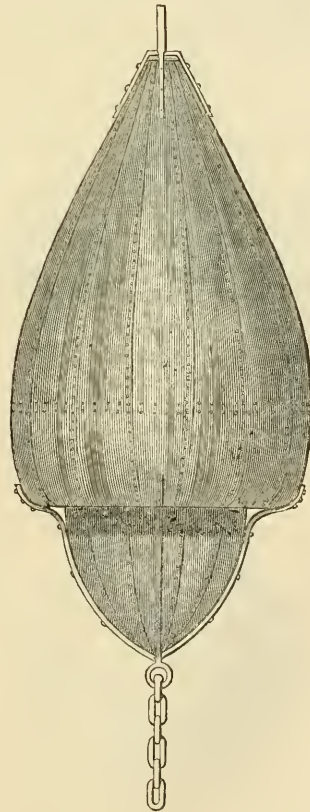
EGG BOTTOM BUOYS.



KEEL CAN BUOYS.



- a. 6 feet, wood; 7 feet, wood; 8 feet, wood.
- b. Plain, 7 feet, 89l. 1s. 6d.; 8 feet, 95l. Staff and globe, 7 feet, 5l. 6s. 4d.; 8 feet, 5l. 6s. 4d.
- c. See return for Can buoys.
- d. See return for Can buoys.
- e. 6 feet, nil; 7 feet, 3 staff and globe; 8 feet, 3 staff and globe.
- f. 6 feet, 9; 7 feet, 5; 8 feet, 1.
- g. 6 feet, 1 at Yarmouth, 8 Coquet Island; 7 feet, 4 at Coquet Island, 1 Cowes; 8 feet, 1 at Cowes.
- h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
- i. 6 feet, nil; 7 feet, nil; 8 feet, 3.
- j. 8 feet, run foul of.
- k. By single chain and sinker or mushroom.
- l. Varies according to extent of chain required by nature of holding ground and character of water. The



Note.—The egg bottom is sometimes removed when worn out, and the buoy replaced, retaining the iron framework for mooring.

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- 7. 9 feet, iron; 17 feet, iron; 0 feet, iron.
- b. Plain, 9 feet, 6*sh.* 19*s.* complete; 17 feet, 13*0l.* complete; 20 feet, 17*0l.* complete. Staff and globe, 17 feet, 9*l.* 3*s.* 6*d.*; 20 feet, 9*l.* 3*s.* 6*d.*
- c. See return for Hollow Bottom buoys.
- d. See return for Hollow Bottom buoys.
- e. 9 feet, two staff and globe; 17 feet, six, four staff and globe, one staff and cross, one staff and diamond; 20 feet, two staff and globe.
- f. 9 feet, one; 17 feet, three; 20 feet, two.
- g. 9 feet Seaton Carew (Tees); 17 feet, two at Blackwall, one at Seaton Carew; 20 feet, one at Blackwall, one at Seaton Carew.
- h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
- i. Nil.
- j. Nil.
- k. By single chain and sinker or mushroom, and, in two or three instances, with double moorings.
- l. Varies according to extent of chain required by nature of holding ground and character of water. The prices of buoy chains, &c. delivered in London were, in 1859,—

1½ in. (71 lbs to the fathom)	-	20 <i>s.</i> per ewt.
1⅝ "	-	22 <i>s.</i> "
1¾ and 7⁄8 in.	-	23 <i>s.</i> "
Cast-iron mushrooms	-	12 <i>s.</i> 9 <i>d.</i> "
Sinkers	-	9 <i>s.</i> 6 <i>d.</i> "
- m. See return for Hollow Bottom buoys.
- n. See details "b" and "e;" names are also painted in large letters on the buoys.
- o. See answer to "e."

BUOYS AND BEACONS.

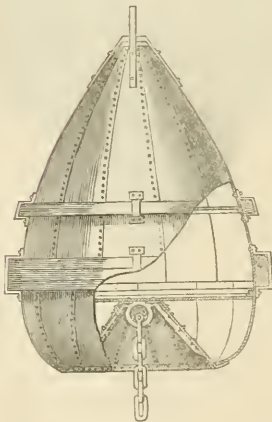
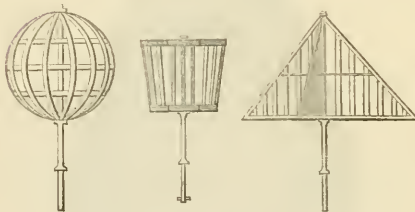
V.

Five of these buoys have been constructed under the Patent, the rest have been adapted to it from other shapes; of the five buoys called 17 feet, three have been adapted from buoys of that size, and now measure 13 feet only. Those called 20 feet are all converted in like manner, and are actually 15 feet in height.

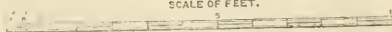
- a. 9 feet buoys, one wood, five iron; 12 feet, iron; 17 feet, iron; 20 feet, iron.
- b. Plain, 9 feet, wood, 47*l.* 10*s.*, iron, 105*l.* 14*s.*; 17 feet, 190*l.* 3*s.* 6*d.*; 12 and 20 feet, not known, no new buoys of those sizes have been procured. Staff and globe, 9 feet, iron, 5*l.* 6*s.* 4*d.* Staff and cage, 9 feet, iron, 4*l.* 9*s.* 10*d.* Mast and globe, 9 feet, wood, 6*l.* 17*s.* 3*d.*
- c. Cannot be ascertained; seldom repaired unless damaged.
- d. Painted by crews of lightvessels while on shore; paint supplied from store.
- e. 9 feet, wood, one mast and globe; iron, five, two plain, two staff and globe, one staff and cage; 12 feet, one bell; 17 feet, five, two plain, two staff and globe, one staff and cage; 20 feet, three, two plain, one staff and triangle.
- f. 9 feet, iron, two; 20 feet, one.
- g. 9 feet, iron, one, Blackwall; one, Plymouth; 20 feet, Blackwall.
- h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
- i. 9 feet, wood, one twice; iron, two. 20 feet, one.
- j. 9 feet, wood, run foul of and waterlogged; iron, one run foul of, other wet adrift. 20 feet, run foul of and sunk.
- k. By single chain and sinker or mushroom; in two or three instances with double moorings.
- l. Varies according to extent of chain required by nature of holding ground and character of water. The prices of buoy chains, &c. delivered in London, were, in 1859,—

1½ in. (71 lbs. to the fathom)	-	20 <i>s.</i> per ewt.
1⅝ "	-	22 <i>s.</i> "
1¾ and 7⁄8 in.	-	23 <i>s.</i> "
Cast-iron mushroom	-	12 <i>s.</i> 9 <i>d.</i> "
Sinkers	-	9 <i>s.</i> 6 <i>d.</i> "
- m. These patent buoys are manufactured by Messrs. Lenox; chains and sinkers are supplied by Messrs. Lenox. The chains of lightvessels are also converted into buoy chains after three years' wear.
- n. See details at "b" and "c;" names are also painted in large letters on the buoys.
- o. See answer to "e."

HOLLOW BOTTOM BUOYS (Herbert's Patent).



SCALE OF FEET.



FLAT BOTTOM BUOYS.

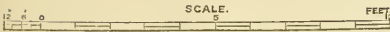
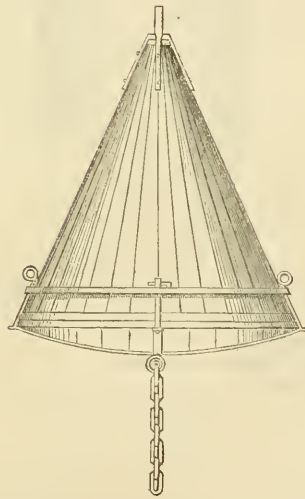
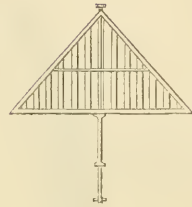
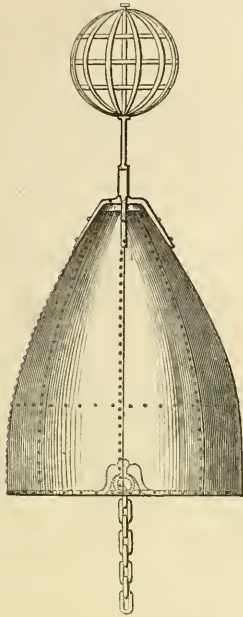
- a. 8 feet, iron; 9 feet, iron; 12 feet, iron.
- b. Plain, 8 feet, 65*l.*
- c. See return for Hollow Bottom buoys.
- d. See return for Hollow Bottom buoys.
- e. 8 feet, two staff and globe; 9 feet, two staff and globe; 12 feet, one.
- f. 8 feet, three; 9 feet, one; 12 feet, nil.
- g. 8 feet, Blackwall, all; 9 feet, Plymouth, 12 feet, nil.
- h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
- i. 8 feet, one; 9 feet, one twice; 12 feet, nil.
- j. 8 feet; run foul of, and dragged out of place; 9 feet, run foul of, and waterlogged.
- k. By single chain and sinker or mushroom.
- l. Varies according to extent of chain required by nature of holding ground and character of water. The prices

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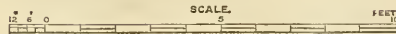
of buoy chains, &c. delivered in London, were, in 1859,—

1½ in. (71 lb. to the fathom)	20s.	per cwt.
1⅝	-	22s.
1⅞	-	23s.
2 and 7/8 in.	-	12s. 9d.
Cast-iron mushroom	-	9s. 6d.
Sinkers	-	-

- m. These buoys were designed and are manufactured by Messrs. Lenox. Chains and sinkers are supplied by Messrs. Lenox. The chains of lightvessels are also converted into buoy chains after three years' wear.
- n. See details at "b" and "e." Names are also painted in large letters on the buoys.
- o. See answer to "e."

CONVEX BOTTOM BUOYS (POULTER'S).

- a. 8 feet, wood; 9 feet, wood; 9 feet, iron.
- b. Plain. 8 feet, 45l.; S.G., 5l. 6s. 4d.; S.C., 4l. 9s. 10d.; S.T., 4l. 18s. 10d. 9 feet, wood, 65l.; S.G., 7l. 1s. 4d.; M.G., 6l. 1s. 6d. 9 feet, iron, 61l. 12s.; M.G., 6l. 1s. 6d.
- c. See return for Can buoys.
- d. See return for Can buoys.
- e. 8 feet, four plain, six staff and globe; one staff and cage; one staff and triangle. 9 feet, wood, two staff and globe; three mast and globe. 9 feet, iron, one mast and globe.
- f. 8 feet, ten; 9 feet, wood, two; 9 feet, iron, nil.
- g. 8 feet, seven at Blackwall, one at Harwich, two at Yarmouth; 9 feet, wood, one at Blackwall, one at Yarmouth. 9 feet, iron, nil.
- h. See answer to "f." Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.



- i. 8 feet, three; 9 feet, nil.
- j. 8 feet, two run foul of, one broke adrift.
- k. By single chain and sinker or mushroom.
- l. Varies according to extent of chain required by natural holding ground and character of water. The prices of buoy chains, &c. delivered in London were, in 1859,—

1½ in. (71 lb. to the fathom)	20s.	per cwt.
1⅝	-	22s.
1⅞	-	23s.
2 and 7/8 in.	-	12s. 9d.
Cast-iron mushrooms	-	9s. 6d.
Sinkers	-	-
- m. Chiefly procured of one firm in London, Messrs. Shuter and Co., Sbad Thames, at agreed prices. Chains and sinkers are supplied by Messrs. Lenox. The chains of lightvessels are also converted into buoy chains after three years' wear.

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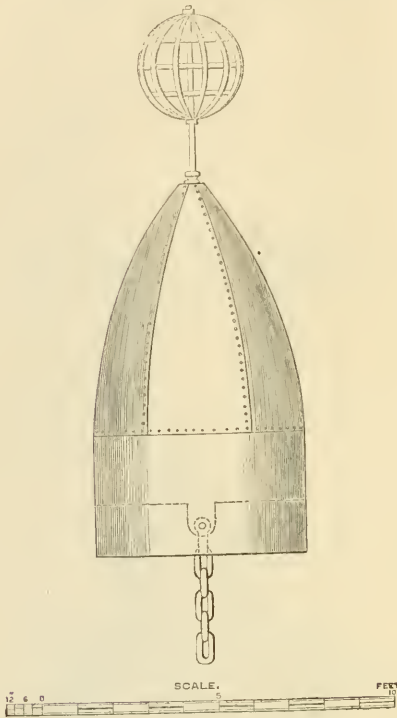
V.

BUOYS AND BEACONS.

V.

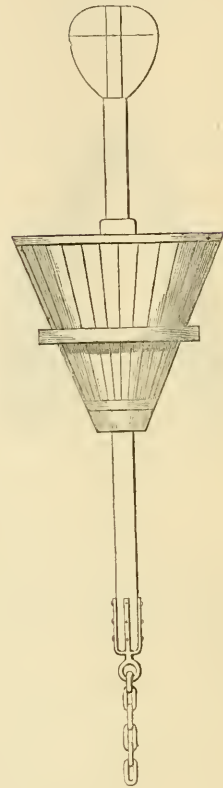
- n. See details at "b" and "e." Names are also painted in large letters on the buoys.
o. See answer to "e."

KEEL BUOYS (Stoney's Patent).



- a. 8 feet, iron.
b. 42l.; staff and globe, 2l. 13s. 6d.
c. Not known.
d. Do.
e. One, spiral, staff and globe.
f. Nil.
g. No reserve.
h. See answer to "f.;" chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
i. None placed in 1858.
j. Nil.
k. By single chain and sinker or mushroom.
l. Varies according to extent of chain required by nature of holding ground and character of water. The prices of buoy chains, &c., delivered in London, were, in 1859,—
- | | | |
|---|---|---------------|
| 1 $\frac{1}{2}$ in. (71 lbs. to the fathom) | - | 20s. per cwt. |
| 1 $\frac{3}{4}$ " | - | 22s. " |
| 1 $\frac{1}{2}$ " | - | 23s. " |
| $\frac{3}{4}$ and $\frac{1}{2}$ in. | - | 12s. 9d. " |
| Cast-iron mushrooms | - | 12s. 9d. " |
| Sinkers | - | 9s. 6d. " |
- m. One only procured of patentee.
n. See details at "b" and "e.;" names are also printed in large letters on the buoys.
o. See answer to "e."

SPIRAL BUOYS.



- a. 4 feet, wood; 6 feet, wood; 6 feet, iron; 9 feet, wood.
b. Plain, 4 feet, nil; 6 feet, wood, 30l. complete; 6 feet, iron, 32l. complete; 9 feet, nil.
c. See return for Can buoys.
d. See return for Can buoys.
e. 4 feet, one; 6 feet, wood, one mast and globe; 6 feet, iron, one mast and globe; 9 feet, one.
f. 4 feet, six; 6 feet, wood, two; 6 feet, iron, two; 9 feet, nil.
g. 4 feet, two at Conway, four at Hilbree; 6 feet, wood, one at Blackwall, one at Harwich; 6 feet, iron, one at Blackwall, one at Heligoland; 9 feet, nil.
h. See answer to "f.;" Chains and sinkers are not set apart for any particular buoy, but are kept suitable and in sufficient quantity for any casualty that may occur.
i. 4 feet, and 6 feet, nil; 9 feet, one.
j. 9 feet, run foul of and waterlogged.
k. By single chain and sinker or mushroom.
l. Varies according to extent of chain required by nature of holding ground and character of water. The prices of buoy chain, &c., delivered in London, were, in 1859,—

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- 1½ in. (71 lbs. to the fathom) - 20s. per cwt.
- 1½ " - - - 22s. "
- 1½ and 7/8 in. - - - 23s. "
- Cast-iron mushrooms - 12s. 9d. "
- Sinkers - - - 9s. 6d. "

tom" buoy (Poulter's). For exposed channels and coasts the Hollow Bottom buoy (Herbert's Patent), or the large Egg Bottom buoys, as at the back of the Goodwin.

- m. Chiefly procured of one firm, in London, Messrs. Shuter and Co., Shad Thames, at agreed prices; chains and sinkers are supplied by Messrs. Lenox. The chains of lightvessels are also converted into buoy chains after three years' wear.
- n. See details at "b" and "e." Names are also painted in large letters on the buoys."
- o. See answer to "e."

VII. Wooden buoys are shifted half-yearly, in March and September, except the "Gabbards," which are shifted yearly. The cage nun buoys are overhauled and painted at least once a year.

VIII. The buoys are thoroughly surveyed on being brought from their stations previous to repair and painting for future use.

VI. For tideways, the ordinary Can buoy; but if required of a distinguishing character, the "Convex Bot-

IX. Form and colour vary too much, according to circumstances, to admit of classification.

X. LIST OF BEACONS under the Authority of the Trinity House, London, with a Statement showing— X.

THEIR NAMES.	The date of erection.	The purpose for which each was erected.	The means of identifying it.	The material used.	The colour.	If lighted by night the means.	Height of summit above high water spring tides.	First cost of erection.	Cost of maintenance.		Income derived in 1855, and Midsummer Quarters 1852 and 1853.	
									1852.	1853.		
Dual House 2 (Thames north side of Gallions Reach.	1832	To lead clear of Barking Reach.	Diamond head.	Wood	Black	No	Feet. { 26 25	£ s. d.	Included in charges for buoys and beacons in river Thames and channels leading thereto.	Included in Return for Buoy and Beacons in River Thames and channels leading thereto.		
Fripcock 2 (River Thames, south side of Barking Reach.	1832		{ 46 22	Not known; built by crews of lightvessels with old spars.								
Sluice 2 (River Thames, south side of Barking Reach.	1832		{ 34 28									
Eriih, south side of Eriih Reach.	1830	In line with Belvidere to lead between Rand Shoal.	"	"	White	"	30	23 6 0	Included in charges for buoys and beacons in river Thames and channels leading thereto.	Included in Return for Buoy and Beacons in River Thames and channels leading thereto.		
Stoneness, north side of St. Clements Reach.	1839	To show the position of the point at high-water.	"	"	Red	"	42	6 18 5				
Broadness, north side of Northfleet Hope.	1821	"	"	"	Black	"	50					
Grays, in Northfleet Hope.	Not known.	In line with West Elbury Church to clear Black Shoal.	"	"	"	"	30		Included in charges for buoys and beacons in river Thames and channels leading thereto.	Included in Return for Buoy and Beacons in River Thames and channels leading thereto.		
Canvey, in Sea Reach -	1857	With Chapman Lighthouse to lead between River Middle and Yantlet Sands.	Diamond and Globe head.	"	"	"	50	47 3 6				
Girdler, south Spit of Girdler Sand.	1846	To mark the north side of Princes Channel.	Triangular head.	Iron	"	"	30					
Shingles, south Spit of Shingles Sand.	1846	"	Diamond head.	"	"	"	30	Do.	Included in charges for buoys and beacons in river Thames and channels leading thereto.	Included in Return for Buoy and Beacons in River Thames and channels leading thereto.		
Pansand, dry part of Pansand.	1774	To mark the Sand.	Cage head	Wood	"	"	32	230 16 2				
Middle Ground, north side of Five-fathom Channel.	1844	To show south edge of the Sand.	"	"	"	"	32	133 6 6				
Hook of Margate, south edge of the sand.	1843	To mark north boundary of the South Channel.	Gallery and globe head.	Iron	"	"	35	See reply to "Girdler."	Nil.	Included in charges for buoys and beacons in river Thames and channels leading thereto.	Included in Return for Buoy and Beacons in River Thames and channels leading thereto.	
Recruers, on the cliff -	about 600	Church and sea mark.	Two square towers and wood beacons.	Flint and wood.	Dark	"	149	Towers 16d. to the vicar and churchwardens.	22 8 8			
Monekton, Isle of Thanet	1791	Sea mark	Round tower.	Brick	"	"	Not known.	Not known	59 16 6			
North Down Tower, Isle of Thanet.	1818	"	Square tower.	Flint	"	"	"	"	Nil	Included in Return for Ramsgate Buoys.		
Redding Street, Isle of Thanet.	1827	"	Like a chimney.	Brick	"	"	"	"	8 8			
Goodwin, Swatchway of the sand.	1844	Warning and refuge.	Mast and basket.	Iron and wood poles.	Black	"	87	1,219 18 7	Nil.			
Miran, north side of Looe Stream.	1793	To mark the shoal.	Cage Head	Iron	"	"	30	628 11 5	Nil.	No income.		
Ashey Down Tower, Isle of Wight.	Not known.	Sea mark.	Tower	Stone	White	"	Not known.	Not known	"			
St. Helen's, Isle of Wight, near Bembridge.	"	"	"	Brick	"	"	"	"	"			

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X.

BUOYS AND BEACONS.

X.

THEIR NAMES.	The date of erection.	The purpose for which each was erected.	The means of identifying it.	The material used.	The colour.	If lighted by night the means.	Height of summit above high-water spring tides.	First cost of erection.	Cost of maintenance.		Income derived in 1852, and Midsummer Quarters 1852 and 1853.	
									£ s. d.			
									1852.	1853.		
Kickersill, Stokes Bay -	Not known.	Sea mark	Tower	Brick	Red and white rings.	No	Feet. Not known.	£ s. d. Not known.	£ Nil.	£ Nil.		
Nelson's Monument, Portland Hill.	"	"	"	Stone.	White	"	"	Not known, built by public subscription, and transferred to the Trinity House.	"	"		
Black Rock (Isle of Wight), near Sconce Point.	1818	Warning	Mast and triangle.	Iron	Black and white.	"	9	Not known	"	"		
Nodes (Isle of Wight), Needles Down.	Not known.	With variegated cliff it clears the Shinglee.	Mast and cage.	Wood	Black	"	470	"	"	"	No income.	
Hurst Point, on the beach.	1812	With high light, a mark for South-west Shingles Buoy.	Pyramid	Brick	Red	"	Not known.	"	"	"		
Portland Bill, on point of the Bill.	Not known.	Lead mark	Tower	Stone	White	"	"	"	"	"		
Cheekstone, Exmouth Harbour.	1835	Warning	Globe head.	Iron	Black	"	12	"	"	"	Included in Return for Easter Buoys.	
Hoe, Plymouth - -	Not known.	Leading mark	Triangular tower.	Stone	Red and white.	"	Not known.	"	1 10 0	0		
Gribben Head, on the Head.	1832	Land mark	Square pillar.	"	"	"	360	1,166 16 7	Nil	- -		
Raymond, Mounts Bay	1850	Warning	Globe head.	Iron	Black	"	10	- -	- -	- -	No income.	
Cressar, Mounts Bay -	1850	"	"	"	Red	"	16	- -	- -	- -		
Black Rock, Falmouth Harbour.	1838	To mark the entrance of the harbour.	Cone, staff and globe.	Stone and wood.	Black	"	37	2,290 9 10	Nil	- -		
Vroome, on the Balk, near Lizard Point.	1839	With mid hummock to mark the rock.	Triangular head.	Wood	Red	"	217	Not known, built by crews of light vessels with old spars.	"	- -	No income.	
Bundlestone, High -	1821	To mark the rock.	Square base and cone top.	Stone	White and Black	"	Not known.	Not known	"	- -		
Bundlestone, Low, on Tol-y-peden.	1821	"	Pyramidal	"	Red	"	"	"	"	- -		
Bundlestone, on the rock.	1795	Warning	Pole and basket.	Iron	Black	"	19	"	5 5 0	- -	No income; chargeable on the Longships light.	
Wolf Rock, entrance of English Channel.	1840	Warning	Cone, mast, and globe.	"	Red	"	36	11,298 4 1	"	- -		
St. Martin's (day mark) St. Martin's Head, Scilly.	1687	Land mark	Like a steeple.	Stone	Rings, red and white.	"	150	Not known	"	- -		
Crow Rock, Crow Sound, Scilly.	1848	Warning	Cone, staff, and globe.	Iron	Red	"	22	- - -	"	- -		
Woolpack, St. Mary's Sound, Scilly.	1848	"	Staff and globe.	"	"	"	23	- - -	"	- -		
Monkstone, Bristol Channel.	1839	"	Tower, mast, and globe.	Stone and iron.	Stone	"	20	1,721 11 9	"	- -		
St. Donat's, on Nash Cliff.	1832	To lead clear of Breakers Point.	- -	Stone	White	"	Not known.	Not known	"	- -		
Tuskar, Swansea Bay -	1839	Warning	Cone, mast, and globe.	Iron	Red	"	29	2,428 17 1	54 3 2	396 4 8	Included in Return for Bristol Channel Buoys.	
Woolhouse, near Caldy Island.	1842	"	Cone, mast, and globe.	Stone and wood.	"	"	33	4,527 7 8	Nil	- -		
Crow (Milford), off Linsey Head.	1855	"	Cone, staff, and globe.	Iron	"	"	25	- - -	407 7 3	- -		
Bwth Head, near Aberdovey.	1850	Land mark	Diamond head.	Wood	White	"	Not known.	Not known	Nil	- -	No income.	
Carmartheo, entrance of the river.	1846	- - -	- -	"	"	"	"	"	"	- -	Included in Return for Carmartheo Buoy.	
Rhoselyn, south part of Holyhead Island.	1829	Land mark	Tower	Stone	Red and white rings.	"	"	"	0 19 0	- -	No income; chargeable on South Stack.	
West Mouse - -	1810	In a line to mark Coal Rock.	Spar	Wood	Black	"	"	Not known	Nil	-	-	No income.
Coal Rock - -	1810		Wall and spar.	Stone	White	"	"					
Coal Rock - -	1822		"	"	"	"	"					
Harry Furlong, off Camlyn Point.	1843	Warning	Triangular head.	Iron	Black	"	20	673 16 4	"	- -	No income.	
Perch Rock, entrance of Menai Straits.	1838	"	Cone, mast, and globe.	Stone	Black and white rings.	"	24	2,024 12 4	"	- -	No income; chargeable on Menai light.	
Corrin, near Peel, Isle of Man.	1808	Sea mark	Tower	"	Stone	"	Not known.	Not known	"	- -	No income.	
Wpaker, north side of Swin Channel.	Presumably 1694	To mark the sand.	Cage head	Wood	Black	"	35	Not known; built by crews of light vessels with old spars.	"	- -	Included in Return for Buoys and Beacons in River Thames and channels leading thereto.	

X. BUOYS AND BEACONS. XIII.

THEIR NAMES.	The date of erection.	The purpose for which such was erected.	The means of identifying it.	The material used.	The colour.	If lighted by night, the means.	Height of summit above high-water spring tides.	First cost of erection.	Cost of maintenance.		Income derived in 1852, and Midsummer Quarters 1852 and 1858.	
									1852.	1858.		
Buxey, north-west part of the sand.	1847	To mark Ray-sand Channel.	Mast and triangular head.	Iron	Black	No	Feet. 30	£ s. d. See reply to "Girlander."	£. s. d. Nil - -	- -	Included in Return for Buoys and Beacons in River Thames and channels leading thereto.	
Naze Tower, near Walton	1720	Sea mark	Castellated top, octagonal tower	Brick	Red	No	Not known.	Not known	58 7 4	3 1 10	- -	
Langard Beach, rear of the fort.	1857	In line to clear the Guard Shoal.	Globe on the head.	Wood	"	"	40	Not known; built by crews of light vessels with old spars.	Nil	2 28 6	5 12 7	Included in Return for Harwich Buoys.
Langard Beach, rear of the fort.	1857		"	"	"	"	35					
Bawdsey, east end of the cliff.	Previously to 1692.	Mark for Sled-way.	Triangular	Brick	Bands red and white.	"	Not known.	384 6 1	Included in cost of Harwich buoys.		- -	
WOODBRIDGE HAVEN.	Two beacons, entrance of haven.	Previously to 1684.	Signals for navigating the river.	Lantern head.	Wood	Red and white.	25	14 11 8	-	-	-	Included in Return for Woodbridge Buoys.
	One beacon, entrance of haven.	1846	Warning	Mast head	"	Red	20					
	Two shifting beacons, entrance of haven.	1850	Guide for Swathway.	Square and triangle.	"	White with black spots.	No	4 16 6	-	-	-	
	Stones (2) River Tees	1810	Leading mark for Stones.	Triangular	Iron and wood.	Black	"	Not known	Included in cost of Tees buoys.		- -	Included in Return for Tees Buoys.
HELLIGOLAND.	No. 1 (Heligoland), on the Island.	1858	Sea mark	Triangular head.	Wood	"	207	2 9 4	1 4 0	- -	- -	Included in Return for Heligoland light-house.
	No. 2 (south), Sandy Island.	1858	"	"	"	"	45	10 16 1	Nil	- -	- -	
	No. 3 (centre), Sandy Island.	1855	"	Double triangle.	"	"	54	- - -	- - -	- - -	- - -	
	No. 4 (north), Sandy Island.	1848	"	Triangular head.	"	"	50	14 19 11	- - -	- - -	- - -	

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XI. See Return to V. e.

XII. In buoying any single channels in future, the rule, where there are no special circumstances to require its modification, will be to place buoys of a single colour, either black or red, on the starboard side on entering from the sea, and party-coloured buoys, either black and white, or red and white, on the port hand, the outermost buoy on either hand being a beacon buoy, if necessary; middle dangers being marked by white buoys with black beacons, of various distinctive shapes.

XIII. No general principle applicable. Form and colour vary according to circumstances.

XIV. & XV. From revenues derivable from dues for lights, buoys, and beacons, paid into the Paymaster General's Office to the account of the Mercantile Marine Fund.

XVI. Total income Midsummer Quarter, 1852, 4579l. 14s. 5d.
Ditto ditto 1858, 3740l. 11s. 0d.
Total income for 1852 - 19,151l. 2s. 4½d.
Total expenditure, 1852 - 7,027l. 10s. 9d.
Ditto 1858, - 7,335l. 10s. 4d.

XVII.

DUDDON BAY.

October 1853.—Rev. A. Wilkin, directing attention to wrecks, owing to want of buoys.

October 1853.—Acquainted that, on requisition being forwarded from trade of neighbourhood, Corporation will entertain, and, if they approve, adopt suggestion.

GIER ROCK, PENZANCE.

March 1854.—Merchants and others memorialize for beacon.

March 1854.—Elder Brethren reiterate views of January 1853, that beacon is more especially useful for purposes of harbour, &c., and that Elder Brethren feel under necessity of declining to construct it.

PLATTER ROCKS, HOLYHEAD.

July 1854.—Admiralty request use of buoys at Holyhead for buoying the Platter Rocks.

July 1854.—Direction sent to Corporation's officer in compliance with their Lordships' wishes.

LIFE BUOY, HAISBERO' SAND.

April 1855.—Miss Gurney, Cromer, recommending one.

April 1855.—Acquainted that such buoys are not within province of Corporation, &c.

April 1855.—Board of Trade transmit proposal for one.

April 1855.—Acquainted that such buoys are not within province of Corporation, &c.

April 1855.—Captain Windham, R.N., requests assistance in placing one and taking charge of it.

April 1855.—Corporation will moor it, &c., but cannot replace in case of loss.

EAST SIDE OF HAPPISDURGH SAND.

May 1855.—Board of Trade transmit proposal from Captain Carter, Coast Guard, for a buoy.

August 1855.—Site examined; buoy not considered requisite.

TEN FEET BANK, BEAUMARIS.

June 1855.—Mr. O. Pritchard, Pilot, Liverpool, suggesting one on north-west spit.

July 1855.—Bank found to be without the borough limits in matters of navigation; buoy placed by Trinity House.

FAIRY ROCK, PORTHCAWL.

March 1856.—Commander Buchan, R.N., Harbour Master, that a buoy is wanted.

March 1856.—Elder Brethren have no objection, but advantage entirely confined to local navigation, not within Corporation's province to lay it.

SEVERN NAVIGATION.

August 1856.—Sub-Commissioners of Pilotage, Gloucester, that pilots desire more conspicuous leading mark through the "Shoots" than the tree on top of Redcliff; recommend white beacon.

September 1856.—Trinity House decline to incur expense, Conservancy of River Severn not being under jurisdiction.

DARTMOUTH BUOY.

October 1856.—Local authorities request assistance in buoying the Pier Rock.

October 1856.—Refused, pending question of future maintenance.

October 1856.—Local authorities request sanction to placing buoy at the pier.

October 1856.—Granted.

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XVII.

November 1856.—Corporation found that buoy previously at the Cheekstone had been used for this purpose. Local authorities asked if they intend to leave that danger unmarked.
May 1857.—Reply that much smaller buoy will do for it, and promise to replace.

EEL POINT, CALDY, AND HIGH CLIFF, PATCH.

January 1857.—Board of Trade, transmitting enclosure from Commander Aldridge suggesting buoy at Northern extremity of ridge.
March and July 1857.—Surveyed; buoys placed.

HOLM SAND.

August 1857.—Collector, Lowestoft, that it has been represented that buoy should be placed on west part of Hook of Sand.
August 1857.—Placed and marked West Holm.

OUTER GREEN GROUNDS.

August 1857.—Swansea Harbour Commissioners for buoy on south-west end.
August 1857.—Buoy placed.

STONES BEACON.

March 1858.—In the course of the discussion relative to "Godrevy," Board of Trade suggest either beacon buoy or skeleton beacon on the Stones.
March 1858.—Trinity House concur, and propose one of Mr. Herbert's.

BEACONS ON MAPLIN; EAST SHOE BURY BUOY, &c.

September 1858.—Admiralty propose to mark a measured mile.
September 1858.—Trinity House see no objection if made distinctive.
October 1858.—Details from Admiralty.
October 1858.—Trinity House concur.

CARMARTHEN BUOYS.

April 1859.—Burry Navigation Company propose bell buoy on Cefn Sidon sands.
April 1859.—E. G. Thomas, Isoed, Kidwelly, proposes light vessel or bell buoy.

Trinity House have subject under consideration.
April 1860.—Navigation Company, that No. 1 buoy should be a bell buoy and placed one mile seaward of present position; that every buoy should be painted a different colour; and that one additional buoy should be placed between Nos. 1 and 2.

Visited by Elder Brethren. New beacon buoy will be placed and changes made in colour of existing ones about 1st August 1860.

MAEN PISCAR AND PENRHOS FYDDLIN, HOLYHEAD.

July 1859.—T. Hirste, Esq., transmitting memorial for a beacon and a buoy.

September 1859.—Visited, but not considered that any buoy or beacon could have availed to protect the vessels adverted to by the memorialists from the dangers in question.

CLIPERA ROCK, HOLYHEAD.

September 1859.—Board of Trade, with letter from Admiralty and memorial from Holyhead.

November 1859.—Trinity House have no objection to offer to bell buoy on Clipera and two other buoys. Board of Trade think expense of bell buoy may be borne by Mercantile Marine Fund, but that other two buoys if within limits of harbour should be placed by Admiralty.

BLACK ROCK, ISLE OF WIGHT.

September 1859.—Admiral Sir E. E. Hamond, Bart., advertising to present position of beacon, and suggesting white buoy at extremity of reef.

September 1859.—Acquainted that buoyage is under direction of Admiralty.

SIZEWELL BANK BUOY.

December 1859.—Board of Trade, with recommendation of receiver of wreck for bell buoy and much larger buoy than at present.

December 1859.—Trinity House do not consider bell buoy necessary to guard this shoal, the lead if properly attended to being a sufficient and infallible guide.

BUOYS AND BEACONS.

CHAPEL ROCK.

April 1860.—Mr. Harris of Hakin, proposing one, through Mr. Bailey.
April 1860.—Surveyed, not deemed advisable.

WOODBRIDGE BEACONS.

April 1859.—Mr. Johnstone, Agent, at suggestion of Masters and Pilots, that when impossible to enter Haven, one red light should be shown from beacons instead of two bright lights, and a black ball by day, so that ships may at once run for Harwich.

Approved.

Changes in the buoyage and beaconage at Liverpool and Hull have from time to time been made with the full concurrence of the Corporation.

STATIONS IN SCOTLAND.

BEACON ON STORNA, PENTLAND.

December 1854.—Northern Commissioners, proposing one.
January 1855.—Sanctioned.

BUOY OFF LOCH INCHARD, SUTHERLANDSHIRE.

BEACON ON BO COOLAS, LOCH INVER.

October 1855.—Northern Commissioners, proposing.
October 1855.—Sanctioned.

BEACON ON VASA, ORKNEY. BUOY OFF GRASSHOLM.

October 1855.—Northern Commissioners, proposing.
October 1855.—Sanctioned.

BEACON ON PABBA.

January 1857.—Northern Commissioners to Board of Trade relative to one.
January 1857.—Elder Brethren of opinion that spot should be well defined by substantial beacon, perhaps of less expensive character than that proposed (500*l*.)

CAIRN BULG BRIGGS.

1856.—Northern Commissioners propose beacon.
February 1857.—Sanctioned.

SOUND OF SKYE.

1857. Northern Commissioners propose beacon on the Goblack reef and buoys on the Gulnare and McMillan Rocks.
January 1857.—Grant sanction for buoys, information insufficient without personal inspection for sanction to beacon.

CALLEACH ROCK, KYLEARIN.

February 1857.—Northern Commissioners propose beacon.
March 1857.—Sanctioned.

SKERVOILE BEACON.

January 1857.—
Trinity House recommend more conspicuous colour.

CARRARA SOUND.

January 1857.
Trinity House recommend buoy on dangerous rock.

SCARGUN ROCK.

January 1858.—Northern Commissioners propose buoy.
January 1858.—Sanctioned.

BAY OF SALEM.

March 1858.—Northern Commissioners propose small buoy.
March 1858.—Trinity House consider that if bay is much frequented at night, buoy should not be less than eight feet.

TUISDALE.

May 1858.—Northern Commissioners propose beacon.
May 1858.—Sanctioned.

BURNT ISLES.

October 1858.—Northern Commissioners propose buoys.
October 1858.—Sanctioned.

LONG CRAIG ROCKS.

November 1858.—Northern Commissioners propose buoys.
December 1858.—Sanctioned.

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BUOYS AND BEACONS.

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SOUND OF APPIN.

February 1859.—Northern Commissioners propose beacon and buoy.
 March 1859.—Sanctioned.

SOUND OF HARRIS.

September 1859.—Northern Commissioners propose buoys.
 December 1859.—Sanctioned.

RIDDOCK SHOAL.

December 1859.—Northern Commissioners propose buoys.
 December 1859.—Sanctioned.

BLACK ROCKS, ISLAY.

December 1859.—Northern Commissioners suggest buoy instead of beacon as originally proposed.
 January 1860.—Concurred in.

LINNE LOCH.

March 1860.—Northern Commissioners propose four additional buoys.
 March 1860.—Trinity House have no objection, but would not be justified in recommending expense from Mercantile Marine Fund.

OBAN.

March 1860.—Northern Commissioners propose a buoy.
 March 1860.—Trinity House have no objection, but would not be justified in recommending expense from Mercantile Marine Fund.

BOGHA NUAGH.

March 1860.—Northern Commissioners propose a buoy.
 March 1860.—Trinity House do not consider buoy required, the dangers being near the shore and sufficiently marked.

(Board of Trade sanction this buoy.)

JURA SOUND.

March 1860.—Northern Commissioners propose three buoys.
 March 1860.—Trinity House do not consider buoy required, the dangers being near the shore and sufficiently marked.

STATIONS IN IRELAND.

KINSALE HARBOUR.

January 1854.—Irish Board propose beacon on Farmer Rock and two buoys.
 October 1854.—Sanctioned.

NORTH ROCK OF FEATHERS, COUNTY DOWN.

June 1854.—Irish Board propose beacon.
 August 1854.—Elder Brethren visit. Outer extremity of danger best site for beacon; but as a beacon on the North Rock will probably be sufficient for the only navigators who ought to use the channel, and is what they ask for, it is sanctioned. Suggestion made that lighthouse on South Rock and buoy should be coloured instead of white.

September 1854.—Irish Board concur, and ask for colour. Elder Brethren reply that it should be a bright red.

GWEEDORE HARBOUR.

July 1854.—Board of Trade inquire as to value of beacon, whether for general or only for local trade.
 August 1854.—Regarded as useful to shipping using harbour, but not to general navigation of the coast.

BAR ROCK, ARDS.

February 1855.—Board of Trade in relation to proposal from Irish Board, as to its being generally or only locally useful.

February 1855.—Trinity House request return of number of vessels using roadstead, and on receipt of reply are disposed to consider a perch would be beneficial to general trade.

SMITH'S ROCK, BALLYCATLIN ISLAND.

September 1855.—Board of Trade in relation to proposal from Irish Board.

September 1855.—Trinity House do not consider erection matter of great necessity, but are disposed to agree in opinion of Mr. Halpin that such a mark would occasionally be useful.

DUNDALK BAY.

October 1855.—Board of Trade forwarding suggestion from Irish Board proposing buoyage of Dunnany Reef and Castle Rock.

October 1855.—Concurred in.
 June 1857.—Board of Trade forwarding suggestions from Irish Board that buoy sanctioned for Castle Rock should be placed on Imogine Rock instead, and painted black, the buoy for Dunnany being red.

June 1857.—Concurred in.
 April 1858.—Irish Board propose change of position for the Imogine buoy.
 April 1858.—Concurred in.

RUSK BANK, CAHORE POINT.

April 1857.—Irish Board proposing buoy at either end.
 April 1857.—Concurred in.

KAY ROCK, VALENCIA.

April 1857.—Irish Board propose buoy.
 April 1857.—Trinity House not disposed to think it useful to "general shipping." Will inspect.
 June 1857.—Concurred in.

BULLOCKMORE ROCK, DONEGAL.

July 1857.—Irish Board propose buoy.
 July 1857.—Sanction, but suggest larger one.

CODLING BUOY.

January 1858.—Irish Board propose buoy.
 January 1858.—Sanction, but that mark should be an 8-foot spiral beacon buoy.

BUTTER PLADDY ROCK, STRANGFORD LOUGH.

February 1858.—Irish Board propose buoy.
 February 1858.—Sanction.

PLADDA LUG.

June 1858.—Irish Board propose beacon.
 July 1858.—Sanction.

ALDERMAN'S ROCK.

March 1859.—Irish Board propose beacon.
 March 1859.—Sanction.

BEERHAVEN.

February 1859.—Irish Board propose marks.
 March 1859.—Elder Brethren concur as to large beacon on Carrig a Vadra, on site of present pillar beacon, and buoy without beacon to mark outer edge of shoal.

Buoy to mark Carriglass patch.
 Board of Trade think greater portion of cost should be borne by Admiralty.

BLACK ROCK, GALWAY BAY.

May 1859.—Irish Board propose improvement in beacon.

May 1859.—Concurred. Board of Trade cannot allow charge on Mercantile Marine Fund.

LOUGH SWILLY.

July 1859.—Irish Board propose buoyage.
 August 1859.—Sanction. Suggest that one buoy on each side be chequered.

September 1859.—Board of Trade propose dark coloured buoys on one side, party coloured on the other, white with beacon for centre dangers.
 Trinity House concur.

ARKLOW BANK BUOYS.

October 1859.—Irish Board propose two.
 October 1859.—Elder Brethren inquire as to height out of water at which Mr. Stoney's 8-foot buoys float.
 October 1860.—Irish Board reply.

Elder Brethren concur as to marks, but think larger buoys should be used.

November 1859.—Board of Trade suggest that buoys should also mark Arklow Swath.

Trinity House concur.
 January 1860.—Irish Board, further as to form and colour.

NORTH BRIGGS ROCKS, BELFAST LOUGH.

November 1859.—Irish Board propose buoy.
 November 1859.—Trinity House inquire as to present perch.

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SPIT OF PASSAGE, WATERFORD.

December 1859.—Irish Board proposing beacon tower on Falskirt Rock.
December 1859.—Trinity House think it might be of service to passing trade.

HORSE SHOE CHANNEL, WICKLOW.

February 1860.—Irish Board propose buoy.
February 1860.—Concur.

STORKS ROCKS, ANTRIM.

March 1860.—Irish Board propose beacon.
March 1860.—Concur.

BLACK SOD BAY.

May 1860.—Irish Board propose buoys or perches.
May 1860.—Trinity House have no objection, but regard them as too local in character to justify recommendation to Board of Trade for charge on Mercantile Marine Fund.

STATIONS IN THE CHANNEL ISLANDS.

GRANDE ANQUETTE.

February 1858.—Board of Trade transmitting correspondence with Admiralty relative to establishment of beacon.

March 1858.—Concur as to expediency.

SUPPLEMENTARY.

BUOYS FOR THE BALTIC.

February 1855.—Admiralty request use of certain buoys for that service.

Trinity House suggest their construction in Woolwich yard, but will lend, if desired, and ultimately do so.

XVIII. The power to place buoys and beacons is vested in the Trinity House; but application for the necessary expenditure has to be made to the Board of Trade. See paper attached.

XIX. By every committee passing, and by local agents whenever afloat. Dates not specially recorded unless occasion arises.

XX. See answer to XIX.

XXI. "Notices to Mariners" freely distributed; advertisements in the newspapers.

XXII. The agent or sub-agent.

XXIII. Pilots and officers in charge of lightvessels are instructed to report, and every encouragement is given to other persons to do so.

XXIV. Dates of complaints or representations made or received by this authority since October 1, 1853, as to—

- a. Nil.
- b. Nil.
- c. Nil.
- d. Nil.
- e. Their colour:—

WISBEACH BUOYAGE.

July 1855.—Trinity House to Wisbeach authorities, that the buoy on Wisbeach Bar, now black, and not readily distinguished from that abreast of it on the Upper Roaring Middle, might be advantageously painted of a different colour.

July 1856.—Wisbeach authorities propose to alter colour of Wisbeach Bar and Outer Roaring Middle Buoys; the beacon buoy at the middle to be black, the bar buoy chequered white and black.

July 1856.—Trinity House see no objection, but due notice should be previously given.

YARMOUTH BUOYAGE.

May 1856.—J. Brady, alleging that certain buoys in the Yarmouth district are in bad condition.

May 1856.—Referred to Superintendent, who reports that what Mr. Brady considers nearly red is the rust from the ironwork; that it is, however, quite discernible from the beachmen's look-out; and that the periodical shifting of the buoys will take place on the first opportunity of weather.

MIXON BUOY.

August 1857.—Swansea Harbour Trust, that it should be painted black instead of white.
August 1857.—Complied with.

BUOYS AND BEACONS.

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PUFFIN ISLAND BEACON, MENAI.

August 1858.—Colonel Williams, that it should be coloured white.

October 1858.—Trinity House concur. It was finally decided that the lower half should be black, the upper half and ball white.

f. Insufficient means of identification:—

DIAMOND AND CREASOR BEACONS, MOUNTS BAY.

September 1856.—Mr. Mathews, that they require painting.

October 1856.—Superintendent reports them to have been painted twice in the year: thinks Mr. Mathews has mistaken the pole on the Geir, erected by the town of Penzance.

MIXON BUOY.

August 1857.—Swansea Harbour Trust, that bell on Mixon is too small.

Improvements in bell buoys have been and are still under trial.

PUFFIN ISLAND BEACON, MENAI.

August 1858.—Colonel Williams, suggesting that apparatus light be thrown on it from the Menai.

An estimate for carrying out this suggestion has been obtained, but has been found too expensive for the advantage to be derived.

HOLM TAIL BUOY.—LOWESTOFT.

1859.—Board of Trade with Wreck Return. Master complaining of want of conspicuous buoy; concurred in by Wreck Receiver.

1859.—Buoy is of largest and most conspicuous description (except monster buoys). Wreck appears attributable to other causes.

BWBCH HEAD BEACON.

May 1859.—Lloyds, with suggestion from Mr. Price, Aberdovey, thereon. Transmitted also from Mr. Price, through the Superintendent.

Woodwork added in advance of the beacon, and the whole painted white instead of red.

g. Insufficient notice of accidents or changes:—

TELEGRAPH BUOYS, OFF DEAL.

June 1858.—Admiralty, with letter from Lord C. Paget, covering memorial from fishermen. &c., Deal, &c., complaining of telegraph buoys.

Inquiries to be made. Telegraph Company to be reminded that sanction should have been obtained.

Company explain that buoys have been placed to mark repairs, and will be removed on completion.

LAVERNOCK BEACON BUOY.

April 1860.—Board of Trade Wreck Return, representing defective state.

Reply.—That it was only reported to be waterlogged the day before, and was not entirely submerged; and that wreck could not have occurred if sailing directions had been attended to.

See letter "e," Wisbeach Buoyage.

See letter "m," Plough Seat Buoy and Beacon.

h. See part of answer to No. XIX., Lighthouses General Return.

i. See part of answer to No. XIX., Lighthouses General Return.

j. See part of answer to No. XIX., Lighthouses General Return.

k. Principle or system of buoyage, or

l. Its want of uniformity:—

March 1858.—Port of Dublin Corporation transmit proposal from Northern Commissioners for uniform system.

Elder Brethren do not think any positive or invariable rule can with safety be laid down; instance entrance of Thames, where buoys on port hand of one channel might be mistaken under various circumstances for those on same side of contiguous channel; and are doubtful whether red and black are sufficiently distinctive when buoys are oxidized and discoloured.

April 1858.—Trinity House to Northern Commissioners, upon their proposed general system of beacons and buoys, viz., on entering a port or harbour keep red buoys on the starboard hand, black buoys on the port hand, while chequered buoys mark central dangers.

That at entrance of many harbours the system may be very advantageous; but that there are many localities where it would not only be inapplicable, but might prove

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BUOYS AND BEACONS.

dangerous, as at entrance of Thames, where there are three contiguous channels, &c.; and further, that colours black and red are not easily discriminated in thick or hazy weather unless paint is kept in more than ordinary degree of freshness.

April, 1858.—Board of Trade send copy of letter from Commander Bedford relative thereto.

Trinity House send Board of Trade copy of above letter to Northern Commissioners.

September, 1859.—Board of Trade, in sanctioning buoyage of Lough Swilly, suggest that in buoying channels for first time the buoys on starboard hand on entering should be either black or red, and on the port hand black and white and red and white; and that, if necessary to buoy a middle bank, the buoys at its ends should be white with a beacon.

Trinity House are disposed to concur; sanction this principle for Lough Swilly.

November, 1859.—Irish Board propose a system, viz., red on starboard, black on port, middle dangers chequered.

Trinity House reply, that wherever there are no special circumstances to require its modification, buoys of a single colour, either black or red, should be placed on the starboard side on entering from the sea, and parti-coloured buoys, either black and white or red and white, on the port hand; the outermost buoy on each hand being a beacon buoy if necessary, and that middle dangers should be marked by white buoys, with black beacons of various distinctive forms.

m. Delay in replacing:—

DARTMOUTH HARBOUR.

1846 to 1860.—In 1846 the Trinity House presented the authorities at Dartmouth with a set of buoys, which were placed on the Cheekstone, the Castle Ledge, and the Holm Stone, upon the understanding that the Local Authorities would take measures for their maintenance; but from time to time as the buoys broke adrift, the assistance of the Corporation was asked and given, until 1853 it was intimated to the town clerk that no further assistance would be rendered, and that they must take measures accordingly.

1855.—Correspondence ensued as to placing the buoys and the light under the Trinity House.

1856.—The buoy of the Cheekstone was transferred by the Harbour authorities to the Pin Rock, and a smaller buoy considered sufficient for the Cheekstone.

1857.—Mr. Willocks complained of the absence of the Cheekstone buoy, and the danger to his yacht in consequence, and the authorities promised to replace the buoy.

Since then the question of the Trinity House taking the buoyage and beaconage has been resumed, and it rests with the authorities at Dartmouth to consent to the toll which has been considered necessary for the cost and maintenance.

RUNDLESTONE BEACON.

1855, June.—Sub-commissioners at Penzance, that two wrecks have occurred, advert to the circumstance of the beacon not having been reinstated, offer some observations as to small service of present buoy, and suggest either new beacon or two additional buoys, to be so moored as, with the present buoy, to encircle the rock.

June, 1855.—Beacon buoy placed immediately; preparation of rock beacon forwarded.

POOLE BUOYAGE.

1856, March.—Board of Trade with wreck return, stating that the "Ranger" stranded in consequence of the disappearance of the small black buoy on the elbow of the Hook Sand.

Elder Brethren call attention of local authorities to 394 and 395 sections of Merchant Shipping Act, 1854, and rely on the buoys being replaced.

April.—Harbour Master, Poole, contradicts in express terms charge of inattention and neglect.

April.—Master of the "Ranger" encloses correspondence with local authorities as regards his claim for compensation.

April.—Acquainted that it is not within our province to decide any question of liability.

PLOUGH SEAT BUOY AND BEACON.

(Jurisdiction of Trinity House, Newcastle.)

1857, January.—Board of Trade with wreck return, advertising to absence of buoys and beacon.

Trinity House enquire of Trinity House, Newcastle, who allege difficulties of weather.

Elder Brethren reply, urging replacement, and explaining practice of giving immediate notice in such cases.

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TUSKAR BEACON.

1858, July.—Board of Trade with report from Coast Guard, Swansea, that stranding of the "Economy" is attributed to defective state of Beacon.

Board of Trade informed of destruction by a vessel; that buoy was placed immediately, and measures taken for restoration; that completion has been unavoidably delayed, owing to the works at the Crow Rock, and will be effected in a few weeks.

SUPPLEMENTARY.

CARDIFF SANDS.

January, 1857.—Board of Trade with wreck return, attributing wreck to defective state of buoy on the spit of Cardiff Sands.

Telegram sent to agent, who replies that buoy is in good order and proper position. Board of Trade informed.

NORTH SCROBY BUOY.

November, 1853.—Said to be placed too far to northward by Mr. Tims, master of the "John."

Found to be in right place. Master informed.

INNER DOWSING.

November, 1853.—J. Harrison, master of the "Charger," that he struck the ground, the buoy bearing W. b. N. two miles.

Superintendent reports no such water; supposes master mistook buoy.

BRIDGWATER BUOYAGE.

December, 1853.—Misleading cask placed by fishermen. Removed upon requisition.

HOLM TAIL SAND.

1855.—Board of Trade with letter from master of "Content," relative to loss, and as to position of buoy. Report from superintendent that it is in right place.

WOLF ROCK BEACON.

October, 1856.—Reported by Master in the Navy under examination, to have disappeared.

District agent reports it all right.

PAKEFIELD GATT.

August, 1853.—Messrs. Gowing, Sons, and Rounce suggest changes in buoyage of Pakefield Gatt.

Reply that channel will be surveyed, and changes made if necessary.

MIDDLE BUOY OF THE HEAPS.

April, 1860.—Board of Trade wreck return, representing that the East buoy is not far enough to the eastward.

Found to be in its place.

See also, generally, Answers to Questions XVII. and XXV.

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"If any buoys or beacons differing materially from those commonly used have been tried by this authority, or if any important improvements or alterations have been suggested to or made by it with regard to the shape or principle of buoys or beacons in any particular, give full information on the subject, and describe the course adopted for ascertaining the value of such suggestions."

BUOYS.

Form, Material, &c.

1845.—The attention of the Corporation was given about this time to the use of iron in the construction of buoys. One or two were made by Messrs. Ditchburn and Marc, and the manufacture was taken up by Messrs. Brown, Lenox and Co. in a special manner.

November.—G. W. Lenox, Billiter Square. Models of buoys constructed for beacon buoys floating with conical ends uppermost, pear shaped buoys, and with platforms making them suitable for refuge buoys. Has also been constructing an 8 feet iron buoy,—a barrel buoy.

1846, January.—Models to be tried in the water, the 8 feet iron buoy when completed to be moored for trial in an exposed situation. Mr. Lenox to send estimate for constructing a 20 feet iron buoy.

June.—The 8 feet iron buoy sent to Blackwall. One 20 ft. buoy ordered.

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August.—A 6 feet beacon buoy, flush rivetted, and an 8 feet ditto, flush rivetted on the head, and snap rivetted on the side, sent to Blackwall for inspection, and adopted.

November.—Three large iron buoys, 20 feet by 10 feet, ordered to be made.

1848, September.—G. W. Lenox, Billiter Square, sends plans for self-ballasting iron buoys by the admission of water.

September.—Adopted.

November.—Board order another 17 feet iron buoy like model, to be experimentally made by Mr. Lenox, and that further trial of water ballast be made by altering the first of the 20 feet buoys that may require repair.

1850, October. Attention of the Corporation called to the fact that their water-ballasted buoys are an infringement of the patent of Mr. Wakefield Pim. Found on inquiry to be the case. 116*l.* paid to Mr. Pim.

1851, January.—License taken for future use.

December.—Mr. Pim's interest in patent was offered to Corporation for 250*l.*, but was declined.

1852.—A patent buoy on Mr. George Herbert's principle, placed experimentally by Mr. Lenox.

1852, November.—Board consider that as regards buoys best adapted for beacon buoys, this buoy far surpasses any other in stability afloat, distinctness of appearance, and convenience of stowage.

1855, May.—Hydrographer, Admiralty, transmits report from Captain Otter, R.N., of H. M. S. "Alban," in relation to appearance of certain buoys in the E. Swin, viz., that he can confidently testify to superiority of that on Herbert's principle in riding, over any of the buoys which the "Alban" passed. (15 of these buoys are at present in position.)

1856, January.—G. W. Lenox proposes to adapt existing wooden buoys to Herbert's patent, by iron base with gangway or parapet, making them safety buoys. Adverts to signals by means of various figures diversely painted on staff, and thinks a light might be exhibited from body of these buoys.

Not adopted.

1858, February.—G. W. Lenox submits buoys of new construction, flat-bottomed, with ring recessed, to which he will be able to fit bell apparatus. (See drawing herewith.)

Form adopted. (Five of these buoys are at present in position.)

1847, March.—J. Poulter, Superintendent, Buoy Wharf, Blackwall. Adverts to buoy with internal heads in lieu of external iron hoops, in use for 14 years, which keeps its colour as painted; submits that new buoys may be made on same plan.

Board concur, and give directions accordingly.

1848, January.—J. Poulter. Submits models showing an improved mode of constructing the large iron buoys, by dividing into compartments with internal heads and with external hoops for fenders.

Adopted.

1849, November.—J. Poulter proposes a mast buoy; not likely to be damaged if fouled, but that will rise freely on the other side of a ship's bottom.

Placed at Aldbro' Knapes, and at Stein Rock, Heligoland.

1852, October.—J. Poulter. Recommends adoption of 8 feet instead of 6 feet vertical buoys for beacons.

Directions given that no more 6 feet vertical buoys shall be fitted with beacons, except under special circumstances.

1853, March.—J. Poulter. Suggests the advantage which would result from the formation of water-tight bulkheads in the centre of wooden buoys.

Adopted.

November.—J. Poulter. Submits model of beacon buoy nearly without hoops, but with a solid wooden bottom, and more base than usual. In June, 1856, Mr. Poulter submitted a similar buoy, but of stronger construction.

Approved. 18 buoys of this character (the convex bottomed buoy) in position.

1854, April.—J. Poulter. Suggests a method for strengthening the heads of the 8 feet vertical buoys.

Approved.

1845, June.—Lient. Rodger, R.N., Chelsea. A beacon buoy and a series of distinguishing figures, so that one hundred and nineteen buoys may be differently marked by various combinations of eleven symbols.

July.—Attended and exhibited at Blackwall.

1848, June.—J. Kingsley, Dublin. Is constructing buoys for indicating shallows, &c., inquires as to mode of addressing Board, and as to practice in event of inventions being adopted.

Acquainted that if he will forward a description, it shall be brought under notice of Board.

November.—By order of Board. Beacon buoys (Can buoys) to be loaded at the nozzle instead of at the bilge.

1849.—Gutta Percha Company. Calling attention to that material for buoys.

1850. In 1850 a 20 feet buoy was constructed of gutta percha by Messrs. Bonney, of Knightsbridge. The cost of it, including shackle, was 200*l.*, arising partly from its being a first attempt. This buoy was soon damaged, and in 1852 was finally condemned.

1850.—Geo. Peacock. A new kind of mark buoy.

1850. Attended and exhibited model.

1852.—Geo. Peacock. Submits printed notice of a buoy laid off Calshot.

Inspected by committee, and found dangerous as refuge, two men being nearly drowned in the experiment.

1853.—Geo. Peacock. Submits model of refuge beacon buoy, and suggests that one should be placed at Chalk Roads, Needles.

Informed that position in which he proposes to place it, is within jurisdiction of the Admiralty.

1854.—Geo. Peacock. That Admiralty have placed one of his buoys on the Shingles, and adverting to causes of imperfect action in buoy inspected by Elder Brethren in 1852.

1852.—W. R. Merry, Whitechapel. Model of safety buoy. Tbanked for opportunity of inspection.

1852, October.—T. C. Clarkson, Gough Square. A patent cork material which he considers may be suitably applied in the manufacture of buoys.

A sample buoy supplied and placed at the E. River Middle Station. This buoy was received in April, 1853, and sent to station; it was condemned as unfit for service, and broken up in January, 1854.

1853, February.—Redpath and Leigh. To manufacture buoys with a patent preparation of iron that will resist action of sea water, and prevent oxidation and the accumulation of any marine, animal, or vegetable matter.

Board order a small buoy to be procured so prepared.

1855.—Messrs. Young, Son, and Magnay. To construct wooden buoys on Mr. George Herbert's principle.

One ordered.

1858, December.—B. B. Stoney, Ballast Office, Dublin. A patent keel buoy. (See drawing herewith.)

Informed that in conformity with practice in similar cases we are prepared to cause it to be tried, should he desire it, at his own expense.

1859.—Replies that he is not in a position to do this, and that the buoy has already been proved successful by the Irish Board. Irish Board transmit report on it from their marine surveyor.

May.—A 9 feet buoy ordered and placed at the E. Margate Station.

1860.—Captain Nisbet, E.B. A mast buoy of peculiar construction. (See drawing herewith.)

Ordered to be tried.

Bell Buoys, &c.

1845, January.—A. Perry, Swansea. Bell buoys for facilitating steam navigation in fogs, each bell to have a different note, the sharpest toned bell nearest the harbour, the deepest toned bell farthest from it. If suggestion be considered worthy of reward, will be obliged by a remittance.

Acquainted that his communication has been laid before the Board.

1846, June.—W. Lodge, Swansea. A bell buoy instead of a beacon buoy off Breaksea Point.

Acquainted that such beacons have been regarded by the Elder Brethren as inefficient, and rather calculated, by producing improper reliance on varying and uncertain sounds, to lead into than to warn from danger.

1848, May.—Admiral Owen, Captain Shortland, R.N. and Mr. Hutchinson. Machine invented by Mr. Hutchinson for producing sound on buoys.

Attended and submitted.

1848, May.—N. D. Maillard, Edward Street, Portland Place. A bell buoy with continuous sound. Will supply fog buoy 8 feet with 2 feet diameter bell, for 35*l.*

Requests leave to submit invention for employment of continuous sound in floating and stationary beacons.

1848, May.—Proposal accepted as regards fog buoy.

August.—Delivers it at Blackwall, moors it at Ramsgate, finds engineering defect in moorings.

September.—Alters it, reports it ready. Appointment made with him at Ramsgate, which he is prevented from keeping. Requests that it may be again tried in water. Directions given to attend to Mr. Maillard's wishes in this respect whenever he may choose to go to Ramsgate. Mr. Maillard so informed.

1848, June.—Admiralty. Inquire as to Mr. Field's invention for employment of continuous sound in buoys and beacons.

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1848, June.—Acquainted that the name of Mr. B. Field is unknown to this Board in connection with this subject.

1850, September.—N. Parsey, Oxford Street. Apparatus for striking a bell by means of a water-wheel, which he regards as adapted for an alarm and signal buoy.

Attended and exhibited model.

1844, February.—A. B., Ramsgate. A floating fence or barricade to encompass each end of the Goodwin Sands. Iron vessels 100 feet long and 20 feet wide, with mast and red ball enclosing large bell. Each vessel to have a separate strong mooring, and be secured at each end to next vessel with strong coupling chains like railway carriages.

1855, April.—Miss C. E. Blackburn, Exeter. An alarm beacon (the invention of her late father), a substitute in many cases for lightvessels. (This proposition was made by her father in 1844, but he declined to explain it without an arrangement as to remuneration.)

1855, August.—Application on her behalf that papers may be returned if not approved. Papers returned.

1855, November.—Mr. G. W. Lenox. Tender for an iron bell buoy with 4 feet bell, and dome for bell. (The buoy one of Herbert's patent.)

Accepted, placed at the Mixon, result not equal to expectation.

1857, February.—J. Boyce, Drogheda. Floating fog whistles rising from a gutta-percha pipe five miles long at every 100 yards, blown by a man on shore with a pair of blacksmith's bellows. If put into operation requests leave to blow the first pair of bellows.

Read.

1857, March.—Geo. Chowen, James Street, Covent Garden. To encircle Goodwin Sands with double row of bell buoys.

Acknowledged, plan to lie on table for inspection.

1857, September.—Captain Close, E.B. Suggestion for method of sounding bell on buoy by means of floats.

Approved. Mr. Lenox's offer to fit the apparatus to one of the present buoys accepted.

There was a mistake in the fitting of this buoy, which is now being rectified.

1858, January.—Lieutenant Morrison, R.N. Proposing bell buoys for Goodwin and other Sands.

Acquainted that the same has been laid before the Board.

1858, July.—Mr. Whettam. Plan for adapting a bell to a buoy so that it shall ring on the slightest motion.

Not adopted.

1859, January.—Mr. G. W. Lenox. A patent tidal bell buoy, worked by an internal wheel. (See drawing.)

Tried near the Maplin, but found inefficient.

1860.—Captain Close, E.B. A new bell buoy. (Drawing herewith.)

At present under consideration.

Illumination of Buoys.

1847, October.—E. and J. Brown, Preston, Lancashire. Are in possession of a method. (Voltaic light.)

1847, October. Permission given to attend and explain it. Arrangement made that Board will bear cost of apparatus if not exceeding 20*l*.

1847, November. Messrs. Brown attend and exhibit voltaic light.—Apparatus referred to Professor Faraday. Mr. Faraday reports that principle is unapplied to buoys. Messrs. Brown informed; letter from them in reply.

1848, January. Acquainted that Board do not consider they have practically demonstrated application, but that they may draw for 20*l*.

1848, February. Messrs. Brown inquire further as to our decision. Board reiterate opinion that they have totally failed.

1848, March. Messrs. Brown remonstrate. Offer to place project in our hands for just remuneration.

Board refer them to previous letters.

1849, July.—E. Brown. Hears we are going to make another attempt to light Goodwin Sands; again offers method of illuminating buoys.

Acquainted that he is entirely mistaken in supposing we have any present intention in regard thereto.

1850, September.—W. W. Bonney, Fulham. A method of producing and sustaining for a longer period than hitherto a most powerful electric light for use in the globes of buoys; will prepare model, provided we will defray expense, &c.

Acquainted that Elder Brethren decline to accede to his proposition.

1850, November.—Bolton Bolton, Chelsea. For lighting up the British Channel and Goodwin Sands with lines of floating gas lamps. (Prospectus herewith.)

1850, December. Acquainted that proposition has been considered by Board, and that we are not disposed to entertain it.

1851, November.—C. Babbage, F.R.S., Dorset Square. A method of illuminating buoys by filling them with gaseous liquids burning without wicks, or by agency of metal rod heated in flame, lighted and put out by mechanism, or left constantly burning. New forms of buoys required, probably columnar, weighted at bottom, and attached to moorings by rings fixed at centre of resistance.

These suggestions were not adopted.

1856, April.—J. W., Post Office, Sunderland. Has a plan for lighting buoys which may be seen in the darkest night. For further particulars address him.

1856, April. Read.

BEACONS.

Dr. Potts.—Proposal for driving piles by atmospheric pressure, as per circular.

The first communication from Dr. Potts was made in July, 1844, and a trial was made at the Blyth Sand in September of that year. The result was so far encouraging as to justify subsequent proceedings.

1845, February. Dr. Potts offers the use of his patent for 1,000*l*.

1845, March. Board offer him an annuity of 100*l*. per annum, subject to six months' notice of discontinuance of use, to which he agrees.

1846, August. Dr. Potts offers to superintend work for Corporation at rate of one guinea per diem for any term exceeding a week, and at rate of one guinea and a half per diem for any term less than a week; coals being supplied by the Trinity Board for his vessel, the Fly, when in use.

This proposal was not accepted.

1847, March. Dr. Potts states that he has made considerable improvements in working his patent.

Admiralty inquire as to value of principle.

1847, September. Admiralty informed of what has been done with it.

1847, October. Information sent to Lieutenant-Colonel Colquhoun, R.A., and other officers forming the Committee for inquiring into constructions on Sands.

Ordnance Office applies for use of lighter, which was lent.

1847, November. Irish Board inquire. Information sent.

1849. Lieutenant-Colonel Abbott, C.B. requests us to point out site suitable for experiment before applying system to works in India. Board suggest Yarmouth. Superintendence there directed to afford information.

1852. Notice given to executors of late Dr. Potts that use of patent will be discontinued.

Dr. Potts's principle has been applied in the construction of the following works:—

A cylinder of three feet diameter driven into the Goodwin Sands.

(This penetrated 79 feet, and rested on the chalk. It is the only beacon on the Goodwin which has maintained its position, and is very valuable both as a sea-mark and a refuge beacon.)

A beacon at South-east Hook of Margate Sand.

A beacon at east-end of Blyth Sand.

A beacon on Buxey Sand off coast of Essex.

A beacon at South Girdler, and one at the Shingles, Prince's Channel.

A beacon at the South Calliper of the Goodwin.

The causeway from the shore to the Mucking lighthouse, 460 feet in length, rests upon piles driven by this process.

1845, July.—Messrs. A. Mitchell and Son, Belfast. Request renewed attention to their screw piles. Offer to provide and fix beacons, where depth of water does not exceed, three fathoms at low water, for 500*l*.

1846, October.—Messrs. A. Mitchell and Son propose to erect upon a single screw pile a beacon possessing the advantages that a vessel running against it would not receive injury whilst the spar, if broken, could be renewed immediately at a trifling expense. Will undertake erection of such beacons for 170*l*. each, including all attendant expenses.

1847, August. Board of Ordnance inquire as to successful application of Messrs. Mitchell's plan.

Informed that it has been used for foundations of lighthouse on the Maplin, and for beacon on the Tongue; and that we have no reason to doubt capacity of piles to bear weights of magnitude, unless from shifting of sand, which occurred to some extent at Maplin, although remedied effectually by artificial means. (The beacon at the Tongue was subsequently injured and removed.)

The Chapman lighthouse is also built upon Mitchell's screw piles.

1847, October.—J. Lewis, Borough. Has a plan for a beacon on the Goodwin. A circular ring of cast iron with half-anchors at every five feet, sunk six feet in the Sand, connected by rods leading inwards with a smaller and rim,

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similar rods from the upper rim to act as stays to a central shaft.

1847, November. May submit it in any way he thinks proper. Does so by letter.

Acquainted that it has been laid before the Board; but that the Corporation has not any present intention of erecting an additional beacon on the Goodwin.

1848, January.—J. Murray, Ph. Dr., Hull. Foundation on Goodwin. A series of hollow cylinders of galvanized iron with another hollow cylinder to form the centre. This to constitute the necessary framework of the caisson; the sand to be removed from the cylinders by Fauvell's principle or other simple means, and muriatic or hydrochloric acid lowered in cases to perforate the rock below; the newly-formed muriate of lime to be brought up by the same cylinder; bolts to be lowered and soldered into solid rock.

Thanked for communication. Informed that Corporation has not any present intention of taking measures for the formation of a foundation for a permanent erection on those Sands.

1848.—Malins and Rawlinson. To galvanize iron used for beacons.

Informed that Corporation do not require use of their patent.

1850, April.—J. Steward, Tunbridge Wells. Renewing proposal for his ponderous-footed beacon for sand banks.

1850, May. Acquainted that the Elder Brethren are not disposed to make trial of beacons constructed in the manner described.

1851, April.—M. Chevalier, Jersey. Submits model of a mast-beacon for half-tide rocks adopted at St. Helier's.

1851, July. This beacon was inspected by committee, but was not adopted.

1858, February.—S. Belin, Plymouth. That buoys and beacons should be inscribed with texts from Scripture.

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Papers and Drawings.

- Dr. Potts' Circular.
- Bolton Bolton's Prospectus.
- Lenox's Bell Buoy.
- Captain Close's Bell Buoy.
- Captain Nisbett's Buoy.
- Stoney's Keel Buoy.

[These papers were received, but this reference to them was considered to be sufficient, and they have not been printed; they are preserved with similar papers.—J. F. Campbell, Secretary, April 13th, 1860.]

XXVI. See Instructions to agents in General Lighthouse return. Attached.

A RETURN enumerating the SUBJECTS of CORRESPONDENCE, since 1853, with the BOARD of TRADE, in which Requests, Suggestions, or Remonstrances have been made to them on Subjects which the Elder Brethren have considered of Importance to the Interests in their charge, but on which the Views enforced by them have not met with the Concurrence of their Lordships, and specifying the first and last Dates of the Correspondence in each Case.
To be included in Answer to Questions No. XIX. in General Lighthouse Return, XX. in General Floating Lights Return, and XXVII. in Buoys and Beacons Return, as per letter from the Secretary to the Commissioners, dated 11th June 1859.

Subjects.	Views of the Trinity House.	Views of the Board of Trade.	First and Last Dates of Correspondence.	
An additional clerk in the collection account office.	That one should be appointed if their Lordships desire that revenue for each light should continue to be ascertained.	That they can only sanction temporary assistance pending settlement of the establishment question.	1854. 17th Feb.	1854. 22nd Feb.
Collection of light dues.	That accounts should continue to be kept, so that amounts collected for either English, Scotch, or Irish lighthouses should be known.	Think that the want of it will not be attended with inconvenience, considering that if at any time required, it may be attained without difficulty, pro hac vice.	15th Nov.	20th Nov.
Official establishment.	The hope that if any distinct case of injury arises from the application of the new scale of pay to clerks appointed before October 1853, upon their promotion, their Lordships will be pleased to give it favourable consideration. (A memorial from a member of the official establishment was transmitted with the letter.)	Do not find in memorial any sufficient ground for altering the scale of salaries as fixed by Order in Council.	1855. 1st March	1855. 6th March
Liverpool collectors	That the salary agreed on for the remuneration of Mr. Hurry should take date from 1st April 1854.	Cannot consent to alter completed arrangements, which, in their opinion, are fair and liberal.	8th Aug.	14th Aug.
Portland dwellings -	Plans for new dwellings, &c.	Modified and reduced by request of Board of Trade.	9th Aug.	12th Aug.
Subscription to London hospital.	The continuance of the customary annual subscription of 105 <i>l.</i> , to enable the corporation to obtain medical and surgical advice to numerous persons in lighthouse, steam and sailing vessels and ballastage services.	£52. 10 <i>s.</i> ultimately sanctioned	31st Aug.	1856. 24th May
Superannuations -	To increase the pension of Benjamin Richards from 7 <i>l.</i> 1 <i>s.</i> to 11 <i>l.</i> 15 <i>s.</i> , in consideration of his mutilation and utter helplessness by loss of hands owing to explosion of a gun.	Regret inability to comply, have no power to authorize higher rate than that already granted.	20th Sept.	1855. 28th Sept.
Collection at the Motherbank.	To make an allowance for boat hire to the collector in addition to his commission.	Think allowance for boat hire objectionable, and that the commission of 10 per cent. will be sufficient for the first year.	3rd Oct.	1856. 14th Feb.
New steam vessel "Argus."	Specification prepared by Trinity House. Trinity House propose that Messrs. Samuda's tender should be accepted, although slightly in excess of another (10,100 <i>l.</i> in six months complete, against 9,887 <i>l.</i> in six or seven months ready for engines), because time is of importance, and the vessel is to be substantially the same as the one recently built by Messrs. Samuda, and the design submitted by them is preferable to that submitted by the other competitor.	Modified by Board of Trade as regards bulk heads and fittings. That as competition was confined to a limited number, it is presumed those only were selected who are considered competent to perform the work. Require that lowest tender should be accepted.	1855. 18th Oct. 1856. 9th May	1856. 31st March 2nd June
Steam vessel service	To increase the salary of the master of the "Irene" 20 <i>l.</i>	Consider remuneration fully adequate, but unwilling to oppose recommendation so strongly pressed, sanction two annual increments of 10 <i>l.</i> each.	1855. 18th Oct.	1855. 3rd Nov.
Liverpool collectors	That Mr. Hurry's retiring allowance be 276 <i>l.</i> 18 <i>s.</i> 2 <i>d.</i>	Grant 225 <i>l.</i> - - - -	14th Nov.	18th Dec.
Salary of agent at the Ferns.	To increase it 10 <i>l.</i> per annum in consideration of enhanced price of provisions, and of his salary being comparatively less than that of other local agents.	That as present salary has been sufficient, and no new duties have been imposed, they are not prepared to sanction increase.	1856. 6th Feb.	1856. 19th Feb.

ENGLAND.
Circular II.

RETURN of the SUBJECTS of CORRESPONDENCE with the BOARD OF TRADE, &c.—continued.

Subjects.	Views of the Trinity House.	Views of the Board of Trade.	First and Last Dates of Correspondence.	
Lundy lighting apparatus.	To accept Messrs. Wilkins' estimate for French apparatus in consideration of arrangement being novel in this country.	Consider supply of these works should not as heretofore be limited to a single manufacturer.	1856. 10th March	1856. 19th May
Compensation to builders invited to tender for Smalls and Needles.	It having been determined not to build by contract, propose 105 <i>l.</i> each to lowest tenders, and 500 <i>l.</i> to the person employed by the contractors generally to take out quantities, as a matter of justice to contractors, and as expedient in case we desire their competition for other works.	Sanction 382 <i>l.</i> 10 <i>s.</i> for quantities, nothing for lowest tenders, considering that if other tenders had been accepted the expenses would have fallen on those now proposed to be reimbursed.	30th April	17th Sept.
Superannuations -	That Mr. James Hall, surveyor of shipping, aged 82, having served 22 years, should be allowed $\frac{4}{12}$ ths of his salary for 17 years, and $\frac{1}{12}$ th for the five years.	Regret that it is not in their power under terms of Superannuation Act.	3rd July	11th July
Skerries light establishment.	To class it as a rock station, so as to give intervals of relief and freedom from duty, having regard to desolate position, destruction of gardens, and death of wife of keeper.	First suggest consolidation with neighbouring establishments, and ultimately, do not feel justified in sanctioning proposal to make it a rock station, but will not object to small increase of pay to existing keepers.	2nd Aug.	6th Nov.
Whitby Pier light -	To undertake the permanent exhibition of the light on the West Pier, until the lights at High Whitby are completed, for the purpose of indicating the danger known as the Whitby Rock.	It does not appear to them that there is so urgent a necessity shown for that step as to justify an expenditure of public money, upon what is really a harbour light.	28th Feb.	19th March
Superannuations -	Mr. Boyns, the agent at the Longships, was pensioned after 32 years service, on $\frac{4}{12}$ ths of his salary, but it was found convenient to retain his supervision three years longer, by which time he had become entitled to another 12th; proposed to give him this, making his pension 27 <i>l.</i> instead of 24 <i>l.</i> , as originally granted.	Sanction 25 <i>l.</i> , following the rule which the Treasury apply in dealing with the Civil Service.	1857. 13th May	1857. 18th May
Superannuations -	To grant Mr. Rutherford a pension in conformity with practice.	Propose Treasury abatements, ultimately consent to larger amount, subject to reconsideration of inability at end of three years. This reservation concurred in by Trinity House.	15th July	21st Oct.
Superannuations -	A pension was granted to William Lloyd for one year, subject to reconsideration; at end of that time, it was proposed to make it permanent.	Are unwilling to admit so young a man (aged 39) to a permanent pension, but have sanctioned its continuance for three years.	24th Sept.	5th Oct.
Engineer's remuneration. (Mr. James Walker.)	That in addition to annual salary, 157 <i>l.</i> 10 <i>s.</i> should be allowed him for an accountant, specially in consideration of accounts for works not under contract.	Consider salary should include all duties required to be performed by him.	1857. 23rd Nov.	1858. 2nd Feb.
Seilly district agency	Proposal to allow agent 10 <i>l.</i> per annum on account of appropriating a room in his own house for official purposes.	Do not see any ground; presume business is conducted in his house, and are not aware of any similar charges elsewhere.	28th Nov.	1857. 5th Dec.
Lowestoft and Portland Infirmaries.	Grant of 5 <i>l.</i> annually to each in consideration of medical and surgical advice to lightsmen, &c.	That it does not appear to them that the cases which may be considered as specially incidental to the Service are sufficiently numerous to justify a grant from the "Mercantile Marine Fund."	31st Dec.	1858. 20th Feb.
Anquette Beacon, Jersey.	Propose a design by Mr. Walker, submitted to the States in 1851, with additions.	Require it to be made smaller and less expensive.	1858. 26th Feb.	5th Dec.
Compensations -	That Mr. Simpson and others similarly circumstanced (<i>i.e.</i> , pension agents superseded by transfer of duty to War Department.) should receive compensation.	In the case of Collectors of Customs similarly situated compensation has been refused on the ground that services performed were of an occasional kind, for which a commission or per centage was from time to time received, and that their receipts were annually decreasing, and would in the course of a very few years entirely cease.	18th June.	1859. 19th Feb.

Subjects.	Views of the Trinity House.	Views of the Board of Trade.	First and Last Dates of Correspondence.	
Yarmouth and Plymouth agencies.	To make allowances of 5 <i>l.</i> to agents in consideration of their not being provided with offices as in other districts, and being compelled to rent larger houses.	Object to allowances; are willing to reconsider salaries.	1858. 19th June	1859. 18th June.
Bishop Rock Light -	That there should not be any toll, in consideration of its having been commenced before the passing of the "Merchant Shipping Act, 1854," and of the trade not having invited its erection nor pledged themselves to contribute, the work having been regarded as an adjunct to the Scilly light, the tolls for which are sufficient to maintain both.	Consider principle now acted on to be that a toll should be imposed for every new lighthouse, and that if the aggregate sum collected for light duties amounts to more than is required for the erection and maintenance of lighthouses generally, the surplus should be dealt with by reducing the tolls generally, rather than by making any special exemption in the case of any particular light.	28th July	31st March.
Hurst light establishment.	To assist the ministrations of a clergyman at Hurst Castle, by payment of 10 <i>s.</i> per service in consideration of advantage to lightkeepers and families, who are three miles and a half distant from the church.	Do not consider it within their power under terms of Act.	16th Sept.	1858. 24th Sept.
Superannuations -	To grant Arthur Watson, an assistant keeper, the minimum pension of a principal (18 <i>l.</i> 11 <i>s.</i> 5 <i>d.</i>) instead of 15 <i>l.</i> , Mr. Watson having been a principal keeper for ten years, to which rank he would have been restored but for his blindness.	That they have no power under the Act.	1859. 11th Feb.	1859. 23rd Feb.
Dartmouth Beacon -	Propose design by Mr. Walker -	Require it to be less costly - -	22nd Feb.	29th July.
Lizard light establishment.	To sanction payment of 3 <i>l.</i> 3 <i>s.</i> for use of pew in church, attended by lightkeepers and families (nineteen in number).	Do not consider they have the power -	23rd March.	29th March.
Solicitor's remuneration (Mr. Symes)	To pay bills for 1858, without subjecting them to the taxation proposed by Solicitor to Customs, and to remunerate for the future by a salary of 300 <i>l.</i> per annum, based on the average of recent years.	That exceptional items in accounts for recent years produced a higher average than would be advantageous to recognize, and that they have no power to overrule taxation.	12th April.	26th April.
Iron lightvessels -	To accept the tender of a London firm, although not the lowest (3,959 <i>l.</i> against 3,750 <i>l.</i>) on account of the admitted superiority of workmanship in the Thames, and the great advantage resulting from these vessels being constructed under the direct personal supervision of the Elder Brethren and their own surveyor.	That as tenders were made by parties invited and not by public competition, they consider the lowest should be accepted.	1859. 10th June.	1859. 23rd June.
Estate at Nayland -	Expenditure for wharf, superintendent's dwelling, buoy store, &c.	Sanction expenditure, but suggest that deduction should be made from salary of superintendent on his taking possession of the house.	1859. 7th Nov.	1860. 11th Jan.
Method of inviting tenders for important works.	The selection of one or of several firms well known from long business connection, whose premises are suitable for the special work required, and are so situated that it can be subject from time to time to the personal inspection and supervision of the Elder Brethren and their surveyors, construction at the outports having been found to be unadvisable.	As a general rule the Board of Trade require a more extended competition or public advertisement.	1854.	1860.
—	Other questions, such as the application of the Treasury practice of making abatements on superannuations, the grant to Yarmouth Hospital, the continuation of the Portland Lights, the details of all new works, &c., &c., have been the subjects of discussion, more or less protracted, with the Board of Trade, the views of the Trinity House having been finally concurred in. The number of letters which have passed between the two Boards since 1st October 1853, amount to 2,839 (apart from a great deal of correspondence in explanation of minute queries upon details of accounts), the Board of Trade requiring to see all specifications and drawings before tenders are invited, and all tenders when received before acceptance.	—	—	—

CIRCULAR No. VI.

EVIDENCE OBTAINED THROUGH LLOYD'S AGENTS APPLICABLE TO COASTS
UNDER THE SUPERINTENDENCE OF THE TRINITY HOUSE.

(Numbered on the same system as the Index Map, geographically from East to West—sunwise.)

1

- I. George Brambles, ship broker and owner, Bridlington Quay.
- II. The DISTRICT of BRIDLINGTON.
- III. Flambro' Head lighthouse and the two Smithic buoys under the control of the Trinity House, Deptford, are the only lights and buoys in this district except the tidal harbour light under control of the Harbour Commissioners.
- IV. There is great room for improvement in the tidal harbour light.
- V. I can suggest no improvement in Flambro' Head Light nor the Smithic buoys.
- VI. See answer to No. XI.
- VII. Oil is used at Flambro' Head Lighthouse, candles for the harbour light.
- VIII. The tidal harbour light is occasionally not exhibited.
- IX. I know of no displacement that has led to accidents.
- X. I know of none.
- XI. The tidal harbour light consists of candles in a lantern, exhibited on a staff at the north pier head, and cannot be lighted in very stormy weather, and when burning can with difficulty be distinguished at sea from the ordinary town lights. Two gas pipes from the harbour master's office to the pier head would enable him to light from there. Two lights, one immediately above the other would obviate the difficulty in making out the harbour light.
- XII. No fog signals are used in this district. I think a bell buoy or other fog signal at Flambro' Head would be valuable.
- XIII. North Smithic buoy, spherical with flat top painted red, South Smithic buoy, spherical with black and white squares.
- XIV. I can recommend no improvement.
- XV. No local dues are levied in respect of lights or buoys.
- XVI. I am not aware of any complaints.
- XVII. I have heard several complaints about the tidal harbour light.
- XVIII. See No. XV.
- XIX. See No. XV.
- XX. See No. XV.

Sir,

Goole, 18th January, 1860.

In reply to your favour, received 10th December last, making inquiry on the subject of lighting and buoying, I have mentioned the subject to several parties, who think that as we are upwards of 50 miles from the mouth of the Humber, and not requiring any peculiar lights or buoys, they have nothing to suggest on the subject, an opinion with which I coincide.

I am, sir,

G. Halsted, Esq., Your most obedient servant,
Lloyd's, London. JAMES WAKE.

Sir,

Yarmouth, 30th Jan., 1860.

In reference to the circular from the Committee for managing the affairs of Lloyd's, of 9th December, 1859, I beg to remark, having conversed with many seafaring persons, and others connected with the navigation of this coast, between Hambro' Head and the River Thames, that I must return the questions of the "Royal Commission on Lighthouses," as not applicable, considering that the arrangements of lights, beacons, and buoys, on the above length of coast are so perfect, and cared for by the Trinity establishments, that I could not offer a remark against the present state of these arrangements.

I am, Sir,

Your obedient Servant,
C. R. JOHNSON,
Superintending Agent.

The Secretary of Lloyd's, London.

2

- I. Thomas Small, Lloyd's agent, Lowestoft.
- II. LOWESTOFT, NORTH and SOUTH ROADS and HARBOUR.
- III. Mr. W. Davie, Trinity agent, Great Yarmouth, and the harbour master at Lowestoft.
- IV. Yes.
- V. I am not aware of any improvement that can at present be made.
- VII. I understand all the lighthouses burn oil, except the inner harbour pier lights, which are coloured gas lamps.
- VIII. None to my knowledge.
- IX. None to my knowledge.
- X. None.
- XI. A red flag is hoisted at first quarter flood for ships entering the harbour, and this is sufficient.
- XII. A gong is sounded on board the Stanford Lightship in thick weather, which I think sufficient.
- XIII. A black beacon buoy is placed on the south end of Holm Sand, and a red buoy on the east side of Newcome Sand which mark the entrance of the Stanford Channel. The Pakefield Channel is marked by a black buoy on the south end of Newcome Sand, and a chequered buoy on north end of Barnard Sand.
- XIV. The present arrangement is good.
- XV. No local dues are levied for lights, buoys, or beacons except the customary Trinity lights.
- XVI. None to my knowledge.
- XVII. The general feeling is satisfactory.
- XVIII. There are no local dues for lights, buoys, or beacons.
- XX. The general opinion is satisfactory.

3

- I. Oliver John Williams, 2, Market Street, Harwich, Lloyd's agent.
- II. HARWICH.
- III. Honourable Corporation of Trinity.
- IV. Well lighted and buoyed.
- V. In consequence of Landguard Beach having of late years extended so far to the westward, it has caused the entrance to Harwich Harbour to become very difficult for strangers to enter in the right time; I would suggest that the low light be removed, and so placed as to bring the high and low lights into one, so as to guide strangers safely in by night, and that the Ridge Sand might be removed, which is much in the way of vessels coming into the harbour at night.
- VI. Provided the low lighthouse was removed, so that the two lights could be brought into one, as the leading mark into the harbour, no other lights or buoys would be required.
- VII. Oil.
- VIII. I have always considered that the lights, both by sea and land, have been kept in excellent order.
- IX. The buoys are so well attended to on this coast, that they very seldom get displaced. I do not remember an accident having occurred.
- X. Accidents have occurred, and do occur to strangers entering Harwich Harbour, in consequence of the low light having to be kept so much open whereas they think that to enter the harbour the lights ought to be kept in one; and it often causes them to get ashore on the Andrew's Shoal on Landguard Beach.
- XI. No signals required; not a tidal harbour; accessible at all times of tide.

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- XIII. At the present moment no fog signals are used; but formerly the church bells were always kept chiming on a flood tide during a fog. This was a good guidance into Harwich Harbour, but the practice has been discontinued, because no remuneration was given to the sexton. I consider it highly essential, and recommend the bells to be continued.
- XIV. No change required, that I am aware of.
- XV. The collector of customs collects a small local tax for the Trinity Board.
- XVI. I am not aware of any complaints having been made.
- XVII. Quite satisfied; the low light is the obstacle, together with the clearance of the Ridge Sand.
- XVIII. I never hear a complaint.

- IX. The buoy of the Walleet broke adrift within a few weeks, but no accident occurred that I am aware of, it was replaced within a few days.
- X. None that I am aware of.
- XI. No tide signals are used; they are not required.
- XII. Fog signals are used, viz., gongs on board the Middle lightvessel and the Gunfleet lighthouse.
- XIII. Buoy on the bar red, can buoy; Eagle black, can buoy; Knowle, black and white striped, with a ball, nun buoy; two buoys in the Spitway, North buoy red, with a ball, nun buoy; South buoy, black, can buoy.
- XIV. Not required.
- XV. The local lights, buoys, or beacons belong to the Trinity House, and are collected by the Collector of Customs, Custom House, Colchester.
- XVI. No complaints have been made that I am aware of.
- XVII. The mariners appear satisfied as to the efficiency of the lights, buoys, &c., but they consider what I have suggested in my answers to questions V. and VI would be a great benefit.
- XVIII. The general feeling amongst mariners frequenting the port is that they do not think the charges and dues excessive.
- XIX. No local duties are collected.
- XX. Satisfied.

4

- I. Robert Dickson, Dovercourt, master mariner.
- II. HARWICH.
- III. Trinity House, London.
- IV. Yes.
- V. In my opinion the low lighthouse ought to be removed and placed in such a position that vessels entering the harbour might bring the high and low lights into one, as was formerly the case before the beach at Landguard extended so much to the westward. At the present time strangers entering the harbour frequently make a mistake by keeping both lights in one, and this sets them on to the beach or Andrew's Sand.
- VI. If the low lighthouse is removed and placed as suggested by me in query V., I do not think that any other alteration is required.
- VII. Oil.
- VIII. Am not aware that any of the lights have ever been accidentally extinguished or not duly exhibited.
- IX. Do not recollect any of the buoys to have been displaced.
- X. Vessels frequently ground on the beach in consequence of its having grown out so much to the westward of late years, and masters keeping the high and low lights in one as formerly.
- XI. No tide signals required; harbour accessible at all times of tide.
- XII. The church bells used to chime on a flood tide during a fog; but I understand that now they are not regularly attended to. I do not know of any system better calculated to be of service than the above, if well attended to.
- XIV. I do not think that any change is required in their arrangement.
- XV. A small tax is collected for the local lights, &c., by the collector of customs, by whom it is remitted to the Trinity Board.
- XVI. Do not know of any complaints having been made.
- XVII. Mariners frequently complain of the high and low lighthouses being placed as they are at present.

5

- I. John Green, Chamberlain Wyvenhoe, near Colchester, shipowner and agent to Lloyd's.
- II. COLCHESTER.
- III. There is no person vested with authority, resident or otherwise (except the Honourable Board of Trinity) for the lights, dues, &c.; they are received at the custom house.
- IV. I consider that the port and the coast adjacent is well lighted, buoyed, and beacons, except two or three additional buoys, beacons, &c. at the spots hereafter mentioned.
- V. The Whitaker Spit buoy would be better if it were larger. A buoy or beacon would be desirable if one was placed on the north spit of the Eagle.
- VI. The light on board the Gunfleet lighthouse would be improved if a bright light was exhibited to the north of the east, and by north and west, and by south; this would lead mariners to know when they ought to tack to clear the Sand. It would also be desirable to have a light placed at the east end of the Middle Sand, this would guide mariners passing the Middle and Whitaker sands.
- VII. Oil only.
- VIII. I do not know a single instance.

6

- I. William Spratt Elgar, Cinque Ports Pilot, 98, Lower Street, Deal, Kent.
- II. LONDON.
- III. Trinity House.
- IV. Not quite.
- V. An additional buoy below the Shingles beacon would be of great service, likewise one below the Mouse Light.
- VI. A lightship on the Varne, near where the buoy is placed, would be of very great service. Many ships coming up channel through hazy weather and southerly winds, keeping a westerly course, do not sight Dungeness, and vice versa.
- VII. Not aware.
- VIII. Not to my knowledge.
- XII. The present fog signals very satisfactory.
- XIII. Various.
- XIV. The present system well adapted for the locality, with the exception of bell buoys at the back of the Goodwin.
- XVII. It has frequently been suggested to me by masters of vessels that a light on the Varne would be very beneficial.
- XX. Satisfactory.

7

- I. Edward Bunbury Nott, Captain Royal Navy, special agent to Lloyd's stationed at Deal, in the county of Kent.
- II. COAST generally from DUNGENESS to DEAL, including GOODWIN SANDS, exclusive of the harbours of Dover and Folkestone.
- III. All the buoys, lights, and beacons within the limits above specified are under the control of the corporation of the Trinity House, Deptford Strand.
- IV. Yes; with exceptions named in reply to question VI.
- V. No alteration seems to be required in the position and size of the buoys now laid down. In reference to numbers, see reply to question VI. The position, height, and colour of lighthouses could not be improved upon.
- VI. In reference to question VI, I beg to submit that, having consulted men professionally experienced in the navigation of the part of the coast referred to, it seems to be the general opinion, that there ought to be a light vessel placed so as to indicate at night the proximity of the "Burne," a dangerous sand, five miles in extent, the north-east end of which bears S.S.W. $\frac{1}{2}$ W., $7\frac{1}{2}$ miles from the South Foreland and S.E. $\frac{1}{2}$ S., $7\frac{1}{2}$ miles from Folkestone church. Such a light would be of very great assistance to ships that, from wind and weather, are obliged to keep an offing, and do not make Dungeness. A light so placed should possess

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- some distinctive mark or property; in point of colour for instance, to prevent its being mistaken. And further, in reference to question VI., I beg to submit, that if the four buoys now placed at the back of the Goodwin Sands, and divided over a distance of eight miles, were considerably increased in numbers, and the which had bells attached to them, it would be the means of preventing many casualties. Vessels to or from the coast of Holland or North Sea, passing to the eastward of the Goodwin with light or moderate breezes, in thick weather, or at night, the master probably a stranger, is not aware that from half ebb to half flood the tide takes a strong westerly direction, which has the effect of setting his vessel immediately towards the sands. As there is from 8 to 10 fathoms water close to the outside of the sands, and the present buoys are two miles apart, there is nothing to warn him of his danger. The French ship "De Ruddn," from Buenos Ayres to Antwerp, valued at 40,000*l.*, and the Norwegian barque, "Hos," from Newport to Helsingfors, valued at 10,000*l.*, both got on the sands in August last in the manner described, and became total wrecks. By far the greater proportion of the casualties that occur on the Goodwin happen at night or in thick weather, with moderate winds.
- VII. Supposed oil.
 VIII. Nil.
 IX. Nil.
 X. See above.
 XI. Usual signals at the ports.
 XII. Usual fog signals used; know of no better.
 XIII. Back of the Goodwin Sands: North Sand Head buoy, high, red with triangle; Swatheyway, black, with diamond top; 3d, to the south, striped black and with cage; South Calliper, high, black with ball. Inside Goodwin:—Deal Bank buoy, red; Bunthead, black and white, rings with ball.
 XIV. No, except as recommended in reply to the VIth question.
 XV. Nil.
 XVI. Nil.
 XVII. Those that exist are efficient; others required as specified.
 XVIII. Unknown.
 XIX. Unknown.
 XX. No.—19th December 1859.

8

- I. James Hewett, Captain, R.N., agent to Lloyd's and Trinity House.
 II. Off EASTBOURNE.
 III. Captain James Hewett, R.N.
 IV. I have not heard any complaint.
 V. Buoys and lighthouse well placed.
 VI. No additional lights or buoys required.
 VII. Oil used at the Beachy Head Lighthouse; a very good light.
 VIII. None.
 IX. Yes; the Sovereign Buoy, in June last, replaced immediately.
 X. I know of none.
 XI. None wanted.
 XII. None required.
 XIII. Red large buoy on the Sovereign Shoal.
 XIV. No.
 XV. None levied.
 XVI. None to my knowledge.
 XVII. None but colliers and fishing boats come here. Beachy Head Light is all that is required.
 XVIII. No local dues collected.
 XIX. None are collected.
 XX. None.

9

- I. William Kitching, Naval Chief Officer of Coast Guard.
 II. Off EASTBOURNE.
 III. Capt. Hewett, R.N., residing at Eastbourne.
 IV. No.
 V. A light ship to be placed in lieu of the buoy on the Sovereign Shoal.
 VI. The Sovereign Shoal. In consequence of the buoy not being visible on a dark night.
 VII. Oil.

- VIII. None, to the best of my knowledge.
 IX. Yes; the Sovereign Buoy, in June last. A vessel supposed to have run it down. Replaced immediately.
 X. I know of none where direct evidence can prove it.
 XI. None wanted.
 XII. None required.
 XIII. Red. Conical. I know of no system in which they are arranged.
 XIV. No.
 XV. None levied.
 XVI. I know of none.
 XVII. The masters of colliers and fishing boats from the place, whom I have consulted, are of opinion that a light ship on the Sovereign Shoal would be of great benefit to shipping in general.
 XVIII. No local dues levied.
 XIX. None are collected.
 XX. I know of none.

10

- I. Thomas Harling and Company, agent to Lloyd's, and ship agents.
 II. COWES, ISLE OF WIGHT.
 III. Admiralty and Trinity Boards.
 IV. Yes, we think so.
 V. We cannot point out any improvement necessary.
 VI. We know of no additional being required.
 VII. Oil.
 VIII. We are not aware of such having been the case.
 IX. We have no recollection of any.
 X. Ditto.
 XI. Not used, therefore not wanted we presume.
 XII. Guns are used we believe at the light stations, and we think they might as well be used at the coast guard stations at the south part of this island, but in stormy weather, as they might not be distinctly heard, the firing of guns or rockets at intervals at Bembridge, and at the forts at Sandown, Freshwater, and Hurst, might be advisable.
 XIII. They are black, white, and red, bell and staff buoys of conical form.
 XIV. We cannot recommend any.
 XV. Lights only, and received by collector of customs for account of the Trinity Corporation.
 XVI. We know of no complaints having been made to the authority above.
 XVII. We have never heard them complain.
 XVIII. Lights being very serviceable and reduced 50 per cent. the general feeling seems to be favourable.
 XIX. We should think they are.
 XX. We are not aware of any.

11

- I. Jonathan Jolliffe, Bonchurch, Isle of Wight, Builder &c.
 II. BONCHURCH, ISLE OF WIGHT.
 III. The only light in my district is the Nab light of Bembridge Point.
 IV. The only point where a light could be of any use is on Dunnose Point, and, I think, not much there.
 V. The only buoys are off Bembridge ledge, which I believe to be sufficient.
 VI. None.
 VII. None.
 VIII. I am frequently having colliers, but I hear of no complaint.

12

- I. Andrew Snape Hamond, Captain R.N., J.P. and D.L. Norton Cottage, Freshwater, Isle of Wight.
 II. WEST CHANNEL OF ISLE OF WIGHT, from Cowes westward.
 III. Admiralty.
 IV. Well lighted, but not sufficiently buoyed.
 V. 1st, another buoy on south side of Shingles shoal recommended; 2nd, a buoy on Pennington Spit; 3d, a buoy on the north-west coast of Blackrock ledge, or the present beacon placed further out; 4th, a buoy on outer ledge of rocks between Warden ledge and Cliff's End Fort.
 VI. Answered under previous head.
 VII. Oil.

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- VIII. Not aware of any.
- IX. Not aware of any.
- X. Have seen numerous vessels on shore on outer edge of Black park; also on Pennington Spit; also between Warden Ledge and Cliff's End Fort; also on southern side of Shingles shoal.
- XI. None wanted.
- XII. Fog signal on Needle Lighthouse very useful.
- XIII. Buoys are of the conical form. Query—whether all the buoys on the northern shore might not be one colour, and buoys on southern shore of an opposite.
- XIV. Answered under previous head.
- XV. Not aware of any.
- XVI. Complaints have been frequently made by masters of vessels with regard to want of a buoy on Pennington Spit; also with respect to Black rock.
- XVII. Generally very good.
- XVIII. None collected.
- XX. Am of opinion that the present management is very good.

- XIV. None.
- XV. None that I am aware of.
- XVII. Good.
- XX. None.

16

- I. Joseph Harding, Pilot, Lombard Street, Portsmouth.
- II. PORTSMOUTH PILOTAGE DISTRICT.
- III. Her Majesty's Dockyard, and Trinity Board.
- IV. Yes, with slight alterations.
- V. Ower's lightvessel to exhibit three lights instead of one, there being too much similarity between it and St. Catherine's.
- VI. A beacon buoy in six fathoms, on the south-west of Fuller Bank. Ships shaping a north-west course into St. Helen's, on the first of a flood tide, and light winds, are liable to be set on that shoal before they are aware of it; it being three to four miles from the shore.
- XIII. Principally black and white; circular, with flat heads; some beacon buoys; white port side of channel, and black to starboard.
- XIV. None.
- XV. None that I am aware of.
- XVII. Good.
- XX. None.

- I. J. Garratt, Lloyd's agent, Portsmouth.
- II. PORT of PORTSMOUTH.
- III. The Government Yard and Trinity Board.
- IV. Yes; with some addition.
- V. Would recommend a beacon on the Deantail buoy.
- VI. Monster beacon buoy about six fathoms on south-west end of Boulder Bank, as when the Prussian frigate "Thetis," arrived at this port a few weeks since would have been on shore had it not been for the Selsey Bill pilots.

- VII. Oil.
- VIII. None.
- IX. None.
- X. None.
- XI. None, and not wanted.
- XII. None; not required.
- XIII. Black and white, circular, with flat heads, white on starboard, and black on port coming into harbour.
- XIV. None.
- XV. None.
- XVI. None.
- XVII. Generally good and approved of.

17

- I. James Cook, 25, Penny Street, Portsmouth, first class Trinity pilot.
- II. PORTSMOUTH.
- III. Authorities of H.M. Dockyard and Trinity Board.
- IV. Yes.
- V. I consider that there should be a more uniform system of placing buoys, so that, as far as practicable, all buoys of a particular colour, say black, should be left on the same hand, say the starboard, in all channels.
- VII. Oil.
- VIII. No.
- IX. No.
- XI. Not wanted.
- XII. Gongs on board the light vessels.
- XIII. Harbour channel buoys, black on port side, white on starboard, in coming in. All can buoys, except Bell Buoy at Spit.
- XVII. Have never heard any complaints.

- I. Henry B. Ash, Starcross, merchant, agent for Lloyd's.
- II. STARCROSS, MOUTH of the RIVER EXE, PORT of EXETER.
- III. The Trinity Board exercise control over the buoys in the harbour and on the bar.
- IV. I think a light on Straight Point would be very desirable for pointing out the position of the bar at night, as many accidents have arisen by vessels touching on the Pole Sands waiting for daylight to enter the harbour whilst standing off and on.
- V. I think a more conspicuous buoy, with a beacon on it for the outer fairway buoy, would be desirable.
- VI. The extreme end of Straight Point, as in thick weather, it would not be obscured.
- VII. No light near.
- VIII. No answer.
- IX. The buoys may have been occasionally temporarily displaced, but I am not aware of any accident in consequence.
- X. 1853, December, the "Hoabets Anker" struck on the Pole Sands, and was wrecked. January, 1854, the "Atalanta," Richard, struck on the Pole Sands and became a wreck. November 20, 1857, the "North Star," Cornish master, grounded on the Pole Sands with a valuable cargo on board, but came off again; vessel injured.
- XI. Ships rarely take the bar at night unless of light draught and in fine weather, and I do not think tide lights are wanted.
- XII. I do not think they are required.
- XIII. Black on the starboard hand and white on the port hand coming in, the fairway buoy being red.
- XIV. No.
- XV. Local charge for the buoys payable to the Trinity House of one halfpenny per ton for British or privileged vessels, and 1d. per ton for unprivileged vessels.
- XVI. None.
- XVII. I have heard it expressed that a light on Straight Point would be desirable.
- XVIII. I am not aware of any complaint.
- XIX. Yes.
- XX. I am not aware of any.

15

- I. Wm. Mair, pilot, 3 Battery Row.
- II. PORTSMOUTH PILOTAGE DISTRICT.
- III. Her Majesty's Dockyard and Trinity Board.
- IV. Yes; with slight alterations.—Owers light vessel to exhibit three lights instead of one, there being too much similarity between it and St. Catherine's.
- VI. A beacon buoy in six fathoms on the south-west end of Fuller Bank. Ships shaping course north-west into St. Helen's on the first of a flood tide and light winds are liable to be set on that shoal before they are aware of it, it being three to four miles from the shore.
- XIII. Principally black and white, circular, with flat heads. Some beacon buoys. White, port side of channel, and black to starboard.

- XVI. None.
 - XVII. I have heard it expressed that a light on Straight Point would be desirable.
 - XVIII. I am not aware of any complaint.
 - XIX. Yes.
 - XX. I am not aware of any.
- James Bishop, East Looe, merchant and shipowner.
- II. LOOE, CORNWALL.
 - III. Nil.
 - IV. No buoys.
 - V. Nil.
 - VI. I would suggest the placing of a tower on St. George's or Looe Island, as it is not easily distinguishable from the mainland in hazy weather.

18

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

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Circular VI.

- VII. Nil.
 X. It is possible that three wrecks might have been avoided had a tower been on Looe Island. These vessels got embayed, and did not know their position.
 XI. A pilot flag is hoisted half-mast at Looe Pier when there is eight feet of water at the mouth of the harbour; at mast-head when there is eleven feet or more.
 XVII. The pilots and others consider it to be desirable that a tower should be erected on St. George's or Looe Island.
 XIX. None collected.

19

- I. William Broad and Sons, general merchants and agents to Lloyd's of 48 years standing.
 II. FALMOUTH.
 III. Elder Brethren of the Trinity House by the local Sub-Commissioners of Pilotage, of whom one is the Collector of Customs. The lighthouse of St. Anthony, and buoys and beacons are more immediately under the care of Captain Ditcham of the Trinity cutter stationed at Plymouth.
 IV. Yes.
 V. We can suggest no improvement in any of these points.
 VI. None.
 VII. Oil is used both at the Lizard and St. Anthony.
 VIII. No such casualty has ever occurred to our knowledge.
 IX. The Manacle buoy has occasionally broke adrift, but has been very speedily replaced by the Trinity cutter, and we know of no accident arising from the circumstance. (It has been our province to notify as quickly as possible, on learning of the drift of the buoy, to Captain Ditcham at Plymouth, and instant attention has been given.)
 X. Not aware of any.
 XI. No tide signals are used, and we have never heard the want of them complained of.
 XII. None used, and we presume are not deemed necessary
 XIII. There are three buoys in Carreg (or Carrick) roads, a black one on the east, and a white one on the west bank, denoting the entrance to the channel, and a black one to the north, showing the fairway to the cross channel. The form is conical. The beacon which is on the Black Rock at the entrance of the port is painted black, with a hollow iron-hooped ball at the summit to give sound.
 XIV. None.
 XV. The local dues for St. Anthony Light are collected by the Collector of Customs. There are no charges for buoys or beacon.
 XVI. Not aware of any.
 XVII. One of efficiency.
 XVIII. Are not aware of any complaints being made, or the least demur to the rating.
 XIX. We can only presume so, the Trinity Board having the receipts.
 XX. The lights and buoys being deemed efficient, public opinion may be considered as favourable.—17th December, 1859.

20

- I. Henry Eden, Falmouth, Commander, R.N., Lloyd's supervising agent.
 II. FALMOUTH.
 III. Trinity House and Admiralty, London.
 IV. Yes.
 V. None.
 VI. None.
 VII. Oil.
 VIII. Not aware.
 IX. Not aware.
 X. Not aware of any.
 XI. None wanted.
 XII. None required.
 XIII. One white and three black buoys, can shaped, and one black beacon on the Black Rock.
 XIV. None.
 XV. For the local light on St. Anthony's Point, on oversea ships, a halfpenny per ton register, less 50 per cent., and on coasters an eighth of a penny per ton register, less 50 per cent. Poleage dues for the beacon on the Black Rock, two shillings and

sixpence each vessel. The above dues are paid to the Trinity House and the corporation of Falmouth.

- XVI. Not aware of any.
 XVII. That they are efficient.
 XVIII. There does not appear to have been any objection to these dues.
 XIX. No means of ascertaining.
 XX. Not aware.—20th December, 1859.

21

- I. William H. Miller, Stratton Place, Falmouth, 36 years commanding Her Majesty's revenue cruisers, 15 years of which on the Falmouth station, and for merely several years an officer in the Hon. E. I. Company's service.
 II. FALMOUTH.
 III. Collector of Customs, and Sub-Commissioners. Port of Falmouth.
 IV. Yes.
 V. None to suggest.
 VI. None.
 VII. Oil.
 VIII. Attendance appears to be very regular and efficient.
 IX. None that I am aware of.
 X. None.
 XI. None used or required.
 XII. None used or required.
 XIII. One buoy on the point of the western bank, white. One buoy on the point of the eastern bank, black, denoting the entrance of Carrig Road channel. One buoy, black, denoting the fairway to the cross roads or channel. One buoy, black, on Lugo Rock, eastward of St. Mawe's Creek. N.B. All can buoys.
 XIV. No.
 XV. None.
 XVI. Not aware of any.
 XVII. Efficient.
 XVIII. No complaints.
 XIX. Yes.
 XX. No.

22

- I. Francis Baufield and Sons, St. Mary's, Scilly, agents for Lloyd's.
 II. The ROADSTEADS and PORT of SCILLY, including SEVEN STONES.
 III. The Honourable Corporation of the Trinity House.
 IV. The place is sufficiently lighted since the lighting of the Bishop Rock Lighthouse. The buoys and beacons of this place are quite insufficient. There being only two beacons, one on the Crow Rock and the other on the Woolpack, both recent erections. There are no buoys whatever.
 V. It has occurred to us that, a distinguishing mark of some kind on the Bishop Lighthouse would prevent the possibility of its being mistaken in thick weather by day for the Eddystone or other rock lighthouse by ships whose reckoning may be much out from any cause.
 VI. It is of great importance that a beacon should be fixed on the Gunners Rock in Bquad Sound. Also that buoys should be placed on Le Jeffrey and Old Wreck, two rocks off Annet Head; also that a buoy should be placed to the north part of Tink Ledge, in the south-west channel of Broad Sound, and a buoy on the Steeple Rock in the north-west channel. It is also important that buoys should be placed on the eastern part of both the Spanish and Bartholomew Ledges in St. Mary's Sound. It is also important that a buoy should be placed to the south of the "Hats," in Crow Sound, a buoy to the south of the "Pots" in St. Mary's Roads, and one to the westward of Bacon Ledge in St. Mary's Pool, and a beacon on the Cow Rock, in the same place, would be very useful. Our reasons for the above are, that they are urgently needed for the safety of ships bound in when in charge of pilots, as they have at present no assistance from buoys and beacons, and it is in consequence much more dangerous than it would be, and buoys on the Spanish and Bartholomew Ledges would be especially useful to coasters bearing up in eastwardly gales, who often come in without pilots.

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

- VII. We do not know, but we believe refined rape oil.
 VIII. These have not been accidentally extinguished for many years at least, but always duly exhibited.
 IX. No buoys at present.
 X. Many losses have occurred on different parts of these islands during the last 20 years, and there can be no doubt that many of them would have been prevented if the above recommended buoys and beacons had been fixed.
 XI. Tide signals are neither used nor required.
 XII. A bell is rung at the Bishop by machinery, and a gong is used at the Seven Stones Lightship in fogs.
 XIII. The beacons are hollow iron cones fixed on the rock, with iron masts, and a hollow cage on the top, painted red.
 XIV. No.
 XV. None lived.
 XVI. We know nothing of what complaints may have been made to the Trinity House.
 XVII. That the lights are efficient, but that buoys and beacons are wanted here in the same way and for the same reasons as for sands and shoals leading into all frequented harbours.
 XVIII. There are none.
 XIX. See last.

23

- I. John Jenkins, St. Mary's, Scilly, captain of a coasting vessel.
 II. SCILLY ISLANDS.
 III. Trinity Corporation, London.
 IV. It is well lighted, but not buoyed and beacons sufficiently.
 V. Beacon on the Picked Rock and a buoy on Steeple Ledge in the north-west channel of Broad Sound. Beacon on the Gunner Rock in Broad Sound; buoys on the Le Jeffrey and Old Wreck Ledges off the north part of the Island of Annet; buoy on the north side of the Tink Ledge, in the south-west channel of Broad Sound; buoys on the eastern side of the Spanish and Bartholomew Ledges, in St. Mary's Sound. Buoy on the southern side of the Hats Ledge in Crow Sound. The reason for my wishing the above buoys and beacons to be placed as above is for the guidance of pilots in charge of ships, and also for the masters of coasting vessels.
 VIII. They have been always duly exhibited and not accidentally extinguished since my remembrance, nor before, that I am aware of.
 IX. There are no buoys.
 X. There have been numerous wrecks on these islands during the last twenty years, many of which would have been avoided if the above buoys and beacons had been in place. I recollect three or four total losses on the Bartholomew Ledge, and several vessels having struck on the Spanish and the Hats Ledges, and many lost in Broad Sound.
 XI. There are no tide signals.
 XII. There is a fog bell on the Bishop Lighthouse worked by machinery, and a gong at the Seven Stones Lighthouse.
 XV. There are no local dues.
 XVII. That as many buoys and beacons as can be desirable in a place where there are so many reefs and rocks.—19th Dec., 1859.

24

- I. H. W. Hartnell, secretary to the Bristol General Steam Navigation Co.
 II. BRISTOL.
 III. The Trinity Board's superintendent at Milford.
 IV. The north shore of Bristol channel is so; the south is capable of improvement.
 V. The post on Nelson's Point at the entrance of the Avon should be replaced by a more conspicuous object.
 VI. A tower may be placed on the Dunball as a lead to the deep water channel of the Swash entering the river. A buoy at each end of the deep water

- channel across the Welsh and English grounds would facilitate the navigation between Newport and Bristol by preventing the necessity of going all round when the land marks are obscured.
 VII. Oil.
 X. Ships and steamers have occasionally grounded on Nelson's Point and the Swash, but with the exception of some delay and expense without injury. Experienced persons have deviated from the right channel when the banks are well covered on spring tides.
 XI. Tide signals not needful.
 XII. Fog signals are much needed with distinguishing strokes of a gong, to be struck if possible by machinery, from the Dunball or Avon light, Blacknose Point, lightship, and so on down channel.
 XV. 1s. per vessel for Burnham Light.
 XVII. Generally satisfactory.
 XVIII. The aggregate paid by steamers for lights is a large item in the coasting trade where voyages are frequent.

25

- I. Henry Edwards, ship agent, Newport, Monmouthshire.
 II. NEWPORT, MONMOUTHSHIRE between RUMNEY RIVER and REDWICK PILL.
 IV. No; a buoy required at Peterston Patch.
 V. 12 feet buoy out of water, painted black.
 VI. See IV. and V.; master mariners, pilots, &c. say a buoy would be very useful.
 VII. Oil.
 VIII. No.
 IX. No.
 X. None.
 XI. None.
 XII. None.
 XIII. Two buoys; entrance of the river Usk, one painted white, other black.
 XIV. None.
 XV. Harbour dues, $\frac{1}{4}d.$ per ton register coasters; $\frac{1}{2}d.$ per ton register over sea, when laden, paid to the harbour commissioners. Local lights belong to the Trinity, $\frac{3}{4}d.$ per ton register, less 5 per cent. off, over sea.
 XVI. Not heard of any.
 XVII. Not much.
 XVIII. No complaints.
 XIX. Yes.
 XX. No.

26

- I. John Smith Phillips, Newport, Monmouthshire, collector of harbour dues, &c.
 II. NEWPORT, MONMOUTHSHIRE.
 III. The Elder Brethren of Trinity House of Deptford Strond.
 IV. Yes.
 VI. The buoys appear to me to be properly placed.
 VII. Oil.
 VIII. I believe the lights have been well attended to, and duly exhibited for many years.
 IX. The "white," or eastern buoy, at the mouth of the river Usk, has been displaced for a short time, but was soon replaced, and not any accident occurred in consequence.
 X. I do not know of any.
 XI. Not required in my opinion.
 XII. I do not think they are required.
 XIII. Colour, one black and one white; form, cylindrical. The black or western, and the white or eastern are placed, one the western, the other on the eastern side of the mouth of the river Usk.
 XIV. I am not aware that any change could be made; the only fault is, that white or eastern buoy is not sufficiently discernible by night.
 XV. Nil.
 XVI. Nil.
 XVII. Satisfied.
 XVIII. Not any local dues.
 XX. I have not heard any opinion expressed as to the management of lights, &c. in this port.

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Circular VI.

27

- I. George Holland, Cwm Ivy Gower, Llanmadock, near Swansea.
 II. WHITFORD.
 III. No person is appointed.
 IV. Bury bar and the harbour is well lighted and buoyed.
 V. I can suggest no improvement, but a light at the Worms Head I consider would be useful.
 VI. No lights more are necessary within the limits of Bury bar.
 VII. All lighted with oil.
 VIII. None that I am aware of.
 IX. None that I have heard of.
 X. I remember none.
 XI. A light on Whitford Scarce from half flood till half ebb.
 XII. I am not aware if fog signals are used.
 XIII. Black buoys in the centre of the channel.
 XIV. I have no reason to recommend any change.
 XV. I am not aware if any dues are levied.
 XVI. Have not heard of any complaints.
 XVII. I consider satisfactorily.
 XVIII. I have heard no direct complaints.
 XIX. I believe so.
 XX. None.

28

- I. Joseph Button, Llanmadock, near Swansea, retired mariner.
 II. WHITFORD.
 III. No person residing here.
 IV. Bury Bar, and the harbours within it, are well lighted and buoyed.
 VI. There are no more lights necessary within Bury Bar.
 VII. Lighted with oil.
 VIII. Am not aware that any have.
 IX. Have not known any accident to have occurred.
 X. Do not remember any.
 XI. A light on Whitford Seare, from half flood till half ebb.
 XIII. Black can buoys in the middle of the channel.
 XIV. Cannot recommend any change in colour, form, or arrangement.
 XVI. Have not known any complaints.

29

- I. John Rees, Saint David's, Pembrokeshire, late master mariner, and agent to Lloyd's.
 II. POORHCLAIS, in the DISTRICT of ST. DAVID'S.
 IV. No.
 V. A beacon.
 VI. There is a dangerous rock about one mile and a half south-west of the port of Poorhclais, which covers at one hour's flood, and is dangerous to vessels trading to this port, and to others seeking shelter at St. Bride's Bay with westerly winds, and a beacon placed on the same would be an improvement.
 X. For the want of a beacon on a rock called the Sledges, which lies to the westward of Abernethy, where several vessels has been lost, and one in November which received a considerable damage, and had to put in to Solva in a sinking state, as reported in the "Shipping Gazette."

30

- I. Thos. Jackson, Lloyd's agent and shipowner, Milford.
 II. MILFORD.
 III. Trinity House.
 IV. No.
 V. Sleomer Island; I know no place where a light is so much needed.
 VI. Weir Point in Milford Haven, and Sleomer Island.
 VII. Oil.
 VIII. None to my knowledge.
 IX. Nil.
 X. Many ships have missed the finest harbour in England, i.e., Milford Haven, for want of a signal on Sleomer Island.
 XI. None used or wanted.
 XIV. No.
 XV. None.
 XVI. None.

- XVII. General complaint of there being no light on Sleomer Island.
 XX. That it is good.

31

- I. David Vaughan, agent to Lloyd's, Fishguard.
 II. CARDIGAN BAY, from ST. DAVID'S HEAD to DINAS HEAD.
 III. I do not know of any other than the Trinity Board.
 IV. No.
 V. I suggest that two beacons should be erected on both heads at Abercastle, and a lighthouse on Cringodie Head, at the entrance of Fishguard Bay, when, during that awful night of the 25th of October, no doubt the "Charles Holmes," from Liverpool for Mobile, might have been saved, as other vessels acquainted with Fishguard Roads brought up and rode the gale out, without destruction to property or life. The lighthouse I propose on Y Penyrcoed Head would lead a light to clear Stumble Head, and lead to a safe anchorage in Fishguard Bay.
 VI. Beacons at Abercastle; lighthouse at Penyrcoed, near the entrance of the roadstead.
 VII. Oil.
 VIII. Not aware of any.
 IX. No other buoy than on the wreck of the brig "Lady Kenmare" at Goodwick, which is carefully attended to by the Trinity Board.
 X. Refer to the wreck of the ships which were lost in October 1846; if there had been a lighthouse to direct vessels every soul would have been saved.
 XI. No.
 XII. No.
 XIII. Green.
 XIV. No.
 XV. North Bishop and Bardsey Island.
 XVI. Several meetings having been called, and well attended, to petition Her Majesty's Government to take into consideration the importance of the bay.
 XVII. The general feeling from all master mariners that Fishguard requires a lighthouse.
 XVIII. Would freely pay.
 XIX. There are no local dues.
 XX. As agent to Lloyd's, I am not aware of any complaint. I have inquired from the most skilful master mariners, they all agree with me, that the foregoing answers would be of the greatest benefit to all vessels trading in the St. George and Bristol Channels, being often blown off by westerly gales from Cork and Waterford.

32

- I. William Bulkeley Jones, agent for Lloyd's, Holyhead.
 II. HOLYHEAD.
 III. The Trinity House.
 IV. I recommend a bell buoy on the Alipera rocks, in Holyhead Bay, and a beacon on Salt Island reef. Memorial sent to the Admiralty by Capt. Hirste, in July 1859.
 VI. A buoy or perch on Maen-y-Piscod Rock, off Rhanolyn, in Carnarvon Bay.
 VII. Oil in the lighthouse and gas in the pier-head lamps.
 VIII. The lights have been duly exhibited every night.
 IX. The Victoria buoy got adrift about a month ago, but was replaced without delay. No accident occurred in consequence.
 X. I am not aware of any.
 XI. No tide signals required here.
 XII. Fog signals on the mountain; a gun fired every half-hour during a fog.
 XIII. All the buoys are painted black, except the Victoria, which is red and white.
 XIV. No change required.
 XV. All local dues are paid at the custom house.
 XVI. I have heard of no complaints.
 XVII. The general opinion is, that the lights are efficient.
 XVIII. I have not heard of any complaints.
 XIX. I should suppose they were as they are collected at the custom house.
 XX. They are well managed under the Trinity Board.—
 27th December 1859.

SCOTLAND.

CIRCULAR No. I.

CONSTITUTION OF GENERAL AUTHORITY, &c.

(The numbers in the outside margin are the corresponding numbers in Circular No. I.—England.)

I. Royal Commission, Lights, Buoys, and Beacons,
7, Millbank Street, S.W., London,
4th June 1859.

II. The Provost of Dundee,
Greenock.
The Sheriff of Edinburgh,
Lanark,
Renfrew,
Bute and Dumbarton,
Argyle,
Inverness,
Ross.
Orkney,
Caithness and Sutherland,
Aberdeen,
Ayr,
Fife,
Forfar,
Wigtown,
Kincairdine,
Kirkcudbright,
Elgin.

The following are the names of the present holders of these offices:—

The Right. Hon. James Moncrieff, M.P., Lord Advocate.
Edward F. Maitland, Esq., Solicitor General.
The Right Hon. John Melville, Lord Provost of Edinburgh.
James Blackadder, Esq., 1st Baillie of Edinburgh.
The Hon. A. Galbraith, Lord Provost of Glasgow.
J. Houldsworth, Esq., 1st Baillie of Glasgow.
John Webster, Advocate, Provost of Aberdeen.
Colin Lyon Mackenzie, Esq., Provost of Inverness.
John Beith, jun., Esq., Provost of Campbeltown.
David Johnson, Esq., Provost of Dundee.
James Duff, Esq., Provost of Greenock.
John Thomson Gordon, Esq., Sheriff of Edinburgh,
Gloucester Place, Edinburgh.
Sir Archibald Alison, Bart., Possil House, Glasgow,
Sheriff of Lanarkshire.
R. Macfarlane, Esq., 31, Heriot Row, Edinburgh, Sheriff of Renfrew.
Robert Hunter, Esq., 67, Northumberland Street, Edinburgh, Sheriff of Bute.
Thomas Cleghorn, Esq., 26, Queen Street, Edinburgh, Sheriff of Argyle.
George Young, Esq., 47, Moray Place, Edinburgh, Sheriff of Inverness.
A. S. Cook, Esq., 35, Great King Street, Edinburgh, Sheriff of Ross.
William E. Aytoun, Esq., 16, Great Stuart Street, Edinburgh, Sheriff of Orkney.
George Dingwall Fordyce, Esq., 5, Forbes Street, Edinburgh, Sheriff of Caithness and Sutherland.
Archibald Davidson, Esq., 24, Rutland Square, Edinburgh, Sheriff of Aberdeen.
John Christison, Esq., 3, Great Stuart Street, Edinburgh, Sheriff of Ayr.
Alexander E. Monteith, Iverleith House, Edinburgh, Sheriff of Fife.
Alexander S. Logan, Esq., 12, York Place, Edinburgh, Sheriff of Forfar.
Adam Urquhart, Esq., 5, St. Colme Street, Edinburgh, Sheriff of Wigtown.
E. D. Sandford, Esq., 11, Randolph Crescent, Edinburgh, Sheriff of Kirkcudbright.
J. Montgomerie Bell, Esq., 2, Forbes Street, Edinburgh, Sheriff of Kincairdine.
B. R. Bell, Esq., 5, Rutland Square, Edinburgh, Sheriff of Elgin.

II. The duties of the Commissioners and their division:—
The duties of the Commissioners are to take charge of the Northern Lighthouses.

Prior to 1857 these duties were discharged by a committee of all members resident in Edinburgh, which met every alternate Wednesday, denominated "The Bell Rock Committee;" but many of the most efficient members having withdrawn their attendance on account of the dissatisfaction with, and indeed constant interference of, the Board of Trade, which they considered prejudicial to the interests of the Commission, an attempt was made to re-construct the committees, by appointing a committee of three to attend each month by rotation. These committees were composed in a great measure of members who, though equally dissatisfied with the proceedings of the Board of Trade, yet considered it their duty to continue to act.

III. SIR,—I AM directed to request that you will move the following information:—
I. Commissioners of Northern Lighthouses, and furnish the following information:—
II. I. A list of the persons who now constitute the Commissioners of Northern Lighthouses, giving the name, rank, and profession of each member, with the number of years during which he has been a member, the mode of election, and remuneration, if any.
V. II. The duties of the Commissioners and their division, with the names of individuals filling each office or composing each committee, and the mode of appointing the committees or other bodies and their members.
VI. III. The days appointed for general or other meetings.
VII. IV. Names of members who attended each meeting in 1857 and 1858, with the dates of their attendance.
VIII. V. Names of members who have been employed on special services or inspections in 1857 and 1858, with a statement showing the nature of the services on which they were employed, and the time occupied.
IX. VI. Copies of the standing orders for the guidance of general or other meetings of the Commissioners and their sub-divisions.
XIII. VII. Detailed account of the system employed in conducting the financial department of the establishment, showing how and where the moneys received for lights, buoys, and beacons are retained pending the process of final transmission, and also mode adopted for maintaining and dispensing the necessary moneys for the current and ordinary expenses of the establishment, and for meeting the bills due under builders, engineers, and other contracts, as well as for regular maintenance of the lights, buoys, and beacons.
XIV. VIII. Names, ages, dates of appointment, and salaries of the persons composing the establishment of the office; and if they are engaged in fulfilling duties other than those connected with lights, buoys, and beacons, state what these duties are, the time occupied in their discharge, and the proportion of salary attached to each duty.
XV. IX. Mode of selecting and appointing the officers.
XVI. X. List of persons in receipt of pensions, superannuation, or similar allowances, the amount paid to each in 1857 and 1858, their ages, the date of superannuation, length of service, and reason assigned for placing them on the retired list.
X. XI. The gross income and expenditure in respect of lights, buoys, and beacons for 1857 and 1858.
XI. XII. A detailed amount of expenditure for the same period, and mode of audit, and the names and office of the auditors.

Should there be any point in this letter on the questions previously sent to the Commissioners of Northern Lighthouses relative to which it may be deemed advisable to communicate personally with the Lighthouse Commissioners in London, I am directed to state, that Friday the 10th instant will be the most convenient day for the Commissioners to receive the Secretary to the Commission of Northern Lighthouses.

I am, &c.
(Signed) J. F. CAMPBELL, Secretary.

RETURN, &c.

In obedience to the preceding, the Commissioners submit,

I. Commissioners, with their names, rank, and profession:—

The following gentlemen are ex-officio Members of the Board of Northern Lighthouses; they are not elected, and they have no remuneration:

The Right Hon. the Lord Advocate.
Mr. Solicitor General.
The Lord Provost of Edinburgh.
The eldest Baillie of Edinburgh.
The Lord Provost of Glasgow.
The eldest Baillie of Glasgow.
The Provost of Aberdeen,
" Inverness,
" Campbeltown,

II.

U

SCOTLAND.
Circular I.
Question II.

- SCOTLAND.
- Circular
I. Question
V.
- III. & IV. CONSTITUTION OF GENERAL AUTHORITY, &c.
- After two years' experience, the Commissioners found it expedient to return to the old arrangement of a committee of all the members resident in Edinburgh, which meet every alternate Wednesday, except in April, August, and September. The committees are appointed by the general meeting in January.
- III. The days appointed for general meetings:—
There are four general meetings in the year, viz.,
1. Second Saturday of January.
2. Third Wednesday of March.
3. Saturday before the Court of Session rises in July.
4. Third Wednesday in November.
Extra meetings can be summoned at any time.
- VII. V. Names of Members who attended each meeting in 1857 and 1858 with the dates of their attendance.
- § 1. 1857.
- Ordinary Committee, 6th January 1857.
Present,
Robert Thomson, Esq., Chair.
E. D. Sandford, Esq.
- General Meeting, 10th January 1857.
Present,
R. Macfarlane, Esq., Chair.
The Right Hon. The Lord Provost.
Robert Thomson, Esq.
Hugh Lumsden, Esq.
John Christison, Esq.
Baillie Brown Douglas.
Adam Urquhart, Esq.
W. E. Aytoun, Esq.
George Young, Esq.
George Moir, Esq.
- Ordinary Committee, 14th January 1857.
Present,
E. D. Sandford, Esq., Chair.
George Moir, Esq.
Robert Thomson, Esq.
- Special Meeting, 21st January 1857.
Present,
Robert Thomson, Esq., Chair.
John Christison, Esq.
R. Macfarlane, Esq.
Adam Urquhart, Esq.
George Young, Esq.
Thos. Cleghorn, Esq.
Baillie Brown Douglas.
- Ordinary Committee, 28th January 1857.
Present,
Robert Thomson, Esq., Chair.
George Moir, Esq.
- Ordinary Committee, 11th February 1857.
Present,
Adam Urquhart, Esq., Chair.
John Christison, Esq.
Thos. Cleghorn, Esq.
- Ordinary Committee, 25th February 1857.
Present,
Adam Urquhart, Esq., Chair.
John Christison, Esq.
Thos. Cleghorn, Esq.
- Ordinary Committee, 11th March 1857.
Present,
Hugh Lumsden, Esq., Chair.
J. M. Bell, Esq.
- Ordinary Committee, 18th March 1857.
Present,
Adam Urquhart Esq., Chair.
John Christison, Esq.
Thos. Cleghorn, Esq.
- Ordinary Committee, 25th March 1857.
Present,
J. M. Bell, Esq., Chair.
Adam Urquhart, Esq.
- Ordinary Committee, 6th May 1857.
Present,
W. E. Aytoun, Esq., Chair.
Baillie Brown Douglas.
- Ordinary Committee, 20th May 1857.
Present,
George Young, Esq., Chair.
Baillie Brown Douglas.
W. E. Aytoun, Esq.
- Ordinary Committee, 17th June 1857.
Present,
E. D. Sandford, Esq., Chair.
R. Macfarlane, Esq.
- Ordinary Committee, 1st July 1857.
Present,
E. D. Sandford, Esq., Chair.
Thomas Cleghorn, Esq.
- General Meeting, 10th July 1857.
Present,
The Hon. the Lord Provost of Glasgow in the Chair.
The Right Hon. the Lord Provost of Edinburgh.
Provost Ewen, Dundee.
Baillie Wright, Glasgow.
Thos. Cleghorn, Esq.
Adam Urquhart, Esq.
G. D. Fordyce, Esq.
John Christison, Esq.
- Ordinary Committee, 15th July 1857.
Present,
Thos. Cleghorn, Esq., Chair.
G. D. Fordyce, Esq.
- On board the "Pharos," Ardrossan, 18th July 1857.
Present,
Alex. E. Monteith, Esq., Chair.
E. D. Sandford, Esq.
Baillie Brown Douglas.
Thos. Cleghorn, Esq.
- Ordinary Committee, 9th October 1857.
Present,
John Christison, Esq., Chair.
Thos. Cleghorn, Esq.
Adam Urquhart, Esq.
- Ordinary Committee, 21st October 1857.
Present,
John Christison, Esq., Chair.
Thos. Cleghorn, Esq.
Adam Urquhart, Esq.
- Ordinary Committee, 4th November 1857.
Present,
J. M. Bell, Esq., Chair.
A. S. Logan, Esq.
- General Meeting, 18th November 1857.
Present,
The Right Hon. the Lord Provost of Edinburgh, Chair.
First Baillie of Edinburgh.
Adam Urquhart, Esq.
Thos. Cleghorn, Esq.
John Christison, Esq.
- Ordinary Committee, 2d December 1857.
Present,
Adam Urquhart, Esq., Chair.
G. D. Fordyce, Esq.
- Ordinary Committee, 16th December 1857.
Present,
Adam Urquhart, Esq., Chair.
G. D. Fordyce, Esq.
- Ordinary Committee, 30th December 1857.
Present,
Adam Urquhart, Esq., Chair.
G. D. Fordyce, Esq.
In all, 24 meetings.
- § 2. 1858.
- General Meeting, 9th January 1858.
Present,
The Right Hon. the Lord Provost of Edinburgh, Chair.
Adam Urquhart, Esq.
G. D. Fordyce, Esq.
John Christison, Esq.
Baillie Blackadder.
- Circular
I. Question
VII.

IV.	CONSTITUTION OF GENERAL AUTHORITY, &c.	IV.	SCOTLAND.
Ordinary Committee, 13th January 1858.	Present,	Ordinary Committee, 7th July 1858.	Circular I.
Adam Urquhart, Esq., Chair.	John Christison, Esq.	Special Meeting.	
Thos. Cleghorn, Esq.		Present,	Question VII.
Ordinary Committee, 22d January 1858.	Present,	Adam Urquhart, Esq., Chair.	
Adam Urquhart, Esq., Chair.	John Christison, Esq.	Thos. Cleghorn, Esq.	
Thos. Cleghorn, Esq.		Committee on Captain Anderson, 8th July 1858.	
Ordinary Committee, 3d February 1858.	Present,	Present,	
J. M. Bell, Esq., Chair.	Adam Urquhart, Esq.	Adam Urquhart, Esq., Chair.	
Adam Urquhart, Esq.	Bailie Blackadder.	George Young, Esq.	
Bailie Blackadder.		Thomas Cleghorn, Esq.	
Ordinary Committee, 17th February 1858.	Present,	Ordinary Committee, 14th July 1858.	
J. M. Bell, Esq., Chair.	Bailie Blackadder.	Present,	
Bailie Blackadder.		J. M. Bell, Esq., Chair.	
Ordinary Committee, 5th March 1858.	Present,	Bailie Blackadder.	
Adam Urquhart, Esq., Chair.	John Christison, Esq.	Committee on Capt. Anderson, 16th July 1858.	
John Christison, Esq.		Present,	
General Meeting, 17th March 1858.	Present,	Adam Urquhart, Esq., Chair.	
Adam Urquhart, Esq., Chair.	John Christison, Esq.	Thomas Cleghorn, Esq.	
John Christison, Esq.		George Young, Esq.	
Thos. Cleghorn, Esq.		General Meeting, 17th July 1858.	
Ordinary Committee, 24th March 1858.	Present,	Present,	
Adam Urquhart, Esq.		W. E. Aytoun, Esq., Chair.	
Adam Urquhart, Esq.		G. D. Fordyce, Esq.	
John Christison, Esq.		The Right Hon. the Lord Provost.	
General Meeting, 17th March 1858.	Present,	E. D. Sandford, Esq.	
Adam Urquhart, Esq., Chair.	John Christison, Esq.	Adam Urquhart, Esq.	
John Christison, Esq.		A. S. Cook, Esq.	
Thos. Cleghorn, Esq.		Thos. Cleghorn, Esq.	
Ordinary Committee, 24th March 1858.	Present,	Committee on Capt. Anderson, 19th July 1858.	
Adam Urquhart, Esq.		Present,	
Adam Urquhart, Esq.		George Young, Esq., Chair.	
John Christison, Esq.		Adam Urquhart, Esq.	
Adam Urquhart, Esq.		Thos. Cleghorn, Esq.	
John Christison, Esq.		Committee on Captain Anderson, 21st July 1858.	
Thos. Cleghorn, Esq.		Present,	
Adam Urquhart, Esq., Chair.		Adam Urquhart, Esq., Chair.	
George Young, Esq.		Thomas Cleghorn, Esq.	
R. Macfarlane, Esq.		George Young, Esq.	
Ordinary Committee, 27th April 1858.	Present,	Ordinary Committee, 18th October 1858.	
Adam Urquhart, Esq., Chair.	John Christison, Esq.	Present,	
John Christison, Esq.		The Right Hon. the Lord Provost.	
Adam Urquhart, Esq.		Ordinary Committee, 3d November 1858.	
John Christison, Esq.		Present,	
Thos. Cleghorn, Esq.		A. S. Cook, Esq., Chair.	
Adam Urquhart, Esq.		Mr. Solicitor-General.	
John Christison, Esq.		G. D. Fordyce, Esq.	
Thos. Cleghorn, Esq.		E. D. Sandford, Esq.	
Adam Urquhart, Esq.		General Meeting, 17th November 1858.	
John Christison, Esq.		Present,	
Thos. Cleghorn, Esq.		Adam Urquhart, Esq., Chair.	
Adam Urquhart, Esq.		Bailie Blackadder.	
John Christison, Esq.		John Christison, Esq.	
Thos. Cleghorn, Esq.		G. D. Fordyce, Esq.	
Adam Urquhart, Esq.		A. S. Cook, Esq.	
John Christison, Esq.		Ordinary Committee, 29th November 1858.	
Thos. Cleghorn, Esq.		Present,	
Adam Urquhart, Esq.		E. D. Sandford, Esq., Chair.	
John Christison, Esq.		A. S. Cook, Esq.	
Thos. Cleghorn, Esq.		G. D. Fordyce, Esq.	
Adam Urquhart, Esq.		Ordinary Committee, 8th December 1858.	
John Christison, Esq.		Present,	
Thos. Cleghorn, Esq.		Adam Urquhart, Esq., Chair.	
Adam Urquhart, Esq.		G. D. Fordyce, Esq.	
John Christison, Esq.		Thos. Cleghorn, Esq.	
Thos. Cleghorn, Esq.		Ordinary Committee, 22d December 1858.	
Adam Urquhart, Esq.		Present,	
John Christison, Esq.		John Christison, Esq., Chair.	
Thos. Cleghorn, Esq.		Thomas Cleghorn, Esq.	
Adam Urquhart, Esq.		Adam Urquhart, Esq.	
John Christison, Esq.		In all, 29 meetings.	
Thos. Cleghorn, Esq.			

- SCOTLAND. V., VI., VII. CONSTITUTION OF GENERAL AUTHORITY, &c. VII., VIII., IX., X. Circul
I.
Questi
XIII
- V. Names of members who have been employed on special services or inspections in 1857 and 1858, with a statement showing the nature of the services on which they were employed and the time occupied.
- § 1.—1857.
1. Names of members :—
Alexr. E. Monteith, Esq., Sheriff of Fife.
Thos. Cleghorn, Esq., Sheriff of Argyll.
E. D. Sandford, Esq., Sheriff of Kirkcubright.
F. B. Douglas, Esq., First Bailie of Edinburgh.
 2. Lighthouses visited and inspected, and other business :—
 - 1st. Conference with the local authorities at Douglas, in the Isle of Man, in regard to the proposed surrender to the Commissioners of the light on Douglas Head.
 - 2nd. Visited the works in progress at Ushenish Lighthouse in South Uist.
 - 3rd. Visited and inspected Barrahead Lighthouse.
 - 4th. Visited and inspected Skerryvore and Shore establishment.
 - 5th. Visited and inspected the works in progress at Rhu Vaal Lighthouse.
 - 6th. Inspected the sites of lighthouses proposed at M'Arthur's Head, Islay, and Phladda Easdale; also those which had been under discussion at Skervule and Ruadsgier.
 - 7th. Inspected the arrangements for coaling and buoy yard at Oban, and agreed to a report on their inconvenience.
 - 8th. Visited the works in progress at the Sound of Mull Lighthouse.
 - 9th. Prevented by stormy state of the weather from landing at Ardnamurchan, but proceeded to Isle Oronsay, in Skye, and inspected the works in progress there.
 - 10th. Visited the works in progress at Kyleakin Lighthouse, in the Sound of Skye.
 - 11th. Proceeded to Portree inspecting the Goblach Reef, on which a beacon had been applied for, and the Gulnare and M'Millan's Rocks, on which buoys had been applied for.
 - 12th. Visited and inspected the works in progress at the new lighthouse of Rona, in the Northern Sound of Skye.
 - 13th. Visited Stornoway Lighthouse, in the Lewis.
 - 14th. Visited Cape Wrath Lighthouse and premises.
 - 15th. Visited Pentland Skerries Lighthouse.
 - 16th. Landed on the Isle of May, and inspected the lighthouse.
 - 17th. Returned, and landed at Granton.
- § 2.—Time occupied.
- Embarked at Ardrrossan on the 18th July, and landed at Granton on the 29th, both days inclusive.
- § 3.—1858.
- On the 17th May a Committee, consisting of—
Adam Urquhart, Esq.
E. D. Sandford, Esq.
John Christison, Esq.
Geo. Dingwall Fordyce, Esq.
- proceeded to St. Abb's Head to meet a deputation of the Elder Brethren, in order to fix the site of the lighthouse. They returned in the evening.
- The Committee of the Commissioners which had been appointed for this year were under the necessity of deferring their visit, in consequence of the "Pharos" requiring some repairs, and other circumstances which prevented her starting till it was too late for the Committee.
- IX. VI. Copies of standing orders for the guidance of general and other meetings.
- Already given with the General Return for Lighthouses.
- XIII. VII. Detailed account of the system employed in conducting the financial department of the establishment, showing—
- (1.) How and where the moneys received for lighthouses, buoys, and beacons are retained pending the process of final transmission; and,
 - (2.) The mode adopted for maintaining and dispensing the current and ordinary expenses, and meeting bills for builders, &c. &c.
1. The collectors of customs in each port are authorized to collect light dues, as per certificate produced. They grant bond to the Queen for their intronmissions, including the light dues.
 - No dues are received by the Commissioners for Beacons and Buoys.
- The Commissioners issue to the collectors light bills (in the form No. 2). These are contained in books of 20, 50, and 100 each, and are numbered continuously in each book. The counterpart, it will be observed is numbered the same as the light bill. The counterparts are returned quarterly; and any number being awaiting, must be accounted for, or an immediate inquiry follows. Collectors are required to remit whenever they have 100*l.*, or once a week; and for this purpose, a book of remittance bills is furnished to them at each port on the Form No. 3. These remittance bills, it will be observed, are made payable to the bankers of the Commissioners in Edinburgh, but are sent through the secretary, who enters them as cash, and sends them on to the bankers. The bankers enter these in a "Revenue Account," from which periodical remittances are made to the Paymaster General, conform to letter, No. 4. It will thus be seen that no officer of the Board receives any cash arising from revenue. The collectors render their accounts in full once a quarter (see Forms, Nos. 5, 6, 7, 8). These are checked by the board's auditor regularly as received.
2. The paymaster general, on requisition from the Commissioners, impresses money into their hands to meet the disbursements (see letter, No. 9). This money is paid by the Commissioners to an account kept by the bankers called the "Disbursement Account." From this account the Commissioners give the secretary temporary advances to meet the payments falling due. The drafts on the account are signed by the secretary, and countersigned by two Commissioners. The mode in which payments are made by the secretary, extending in sums of all amounts and payments, all over Scotland, is, in general, by issuing receipts in the Form No. 10 to the parties, with an authorisation in the corner, signed by the secretary, which is considered equivalent to a letter of credit.
- Tradesmen's accounts are rendered in specific forms (given with General Lighthouse Return, Answer to Query XXIII., No. 13), and are paid in a similar manner. They are all checked by the accountant of the Board, and subsequently pass through the Audit Office, in London. Accounts for new works are paid in a similar way, with the addition of a certificate from the engineer of the amount being due.
- The Commissioners render their accounts quarterly to the Board of Trade. Forms of these have been given with the General Lighthouse Return.
- VIII. Names, ages, dates of appointment, and salaries of establishment.
1. Alexr. Cunningham (54), secretary and cashier, entered as clerk 1st January 1826, appointed joint secretary 8th January 1842, and principal secretary in 1846, and secretary, cashier, and general manager 1855. Salary 900*l.*
 2. George Steuart (37), accountant, entered the service in January 1847. Salary 290*l.*, to rise 10*l.* a year to 300*l.*
 3. John Sherar (58), book-keeper and sub-cashier, entered the service 18th August 1828, and appointed engineer's clerk and book-keeper and sub-cashier in 1851. Salary 250*l.*
 4. George Piggott (56), senior clerk, entered the service as clerk to the accountant in 1837, promoted to his present situation in 1855. Salary 150*l.*
 5. James Murdoch, jun., (24), second clerk, entered the service 26th December 1849. Salary 90*l.*, to rise 5*l.* per annum till it reach 100*l.*
 6. William Laurie Barbour (24), third clerk, entered the service 11th November 1851. Salary 70*l.*
 7. John Sherar, jun., (18), junior clerk, entered the service 1st July 1858. Salary 50*l.*, to rise 10*l.* per annum till it reach 60*l.*
 8. David Scott (59), superintendent of lightkeepers, entered the service in March 1849. Salary 240*l.*, to rise 10*l.* per annum till it reach 250*l.*
 9. Peter Hume (37), foreman of lighthouse repairs, entered the service 24th October 1855. Salary 170*l.*, to rise 10*l.* per annum till it reach 200*l.*
- The time of the above officers is entirely occupied in the business of the Lighthouse Board, and their salaries are wholly chargeable to the lighthouse funds.
- IX. Mode of selecting and appointing these officers. X
- By a majority of the votes of the Commissioners.
- X. List of persons in receipt of pensions for superannuation in 1857 and 1858, their ages, date of superannuation, and reason for placing on list.

Circular
I.
Question
XVI.

X., XI., XII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XIII., XIV., XV.

SCOTLAND.

AMOUNT OF SUPERANNUATION ALLOWANCES for 1857 and 1858.

Circular
I.
Question
XVI.

Name.	Nature of Service.	Why Superannuated.	Date of Superannuation.	Length of Service.	Age at Date of Superannuation.	Amount in 1857.	Amount in 1858.
John Murray	Late boatmen	Deficiency of sight	15 May 1842	19 years	61	£ 18 6 8	£ 18 6 8
Matthew Harvie	lightkeeper	Age	15 May 1843	43	67	69 7 4	69 7 4
Jas. Wallace	do.	Bad health	28 Feb. 1844	17	51	34 0 0	34 0 0
Andw. Adamson	do.	do.	28 Feb. 1844	25	63	47 0 0	47 0 0
Will. Soutar	do.	Age	15 May 1844	29	55	48 10 0	48 10 0
Wm. Heddle	do.	Loss of sight (dead).	26 June 1844	10	47	17 15 0	14 17 1
Alex. Burnett	do.	Bad health	15 Jan. 1845	35	59	45 0 0	45 0 0
John Scott	mate, Bell Rock tender.	do.	1 July 1846	26	53	90 0 0	90 0 0
Thos. Quirk	lightkeeper	Age	17 March 1847	30	60	45 0 0	45 0 0
Alex. Harp	do.	Bad health	16 May 1849	30	64	53 0 0	53 0 0
Thos. Dawson	do.	Age	17 Oct. 1849	35	66	62	62 0 0
Lachlan Kennedy	superintendent.	Age (dead)	1 Jan. 1850	40	68	208	82 3 6
David Stewart	lightkeeper	Failure of sight	19 Dec. 1850	39	66	55 10 0	55 10 0
Thos. M'Urich	master, Bell Rock tender.	Discontinuance of vessel.	9 Dec. 1851	43	63	224 7 4	124 7 4
Thos. Ritson	lightkeeper	Bad health	19 Dec. 1851	20	49	27 15 0	27 15 0
Alan Stevenson	engineer	do.	16 March 1853	24	46	400 0 0	400 0 0
John Adair	lightkeeper	do.	21 March 1853	30	62	73 4 0	73 4 0
John M'Cracken	do.	do.	7 June 1854	11	38	18 0 0	18 0 0
James Black	do.	do.	1 Aug. 1855	30	60	49 19 0	49 19 0
Jas. Murdoch	foreman	Age	1 July 1855	38	75	138 15 0	138 15 0
Robt. Seater	storekeeper	Age	1 Jan. 1857	27	69	40 15 6	54 7 4
Jas. Lindsay	lightkeeper	Bad health	1 Aug. 1857	37	56	10 15 4	58 5 4
Peter Soutar	buoymaster	Age	15 May 1858	50	68	—	60 4 4
Will. Weir	engineer, Pharos.	Bad health	1 Aug. 1858	20	58	—	5 0 0
Euphemia Poole	Before the passing of the Act 1856. See par. Report 1845, App 558.					5 0 0	5 0 0
						1,682 6 10	1,679 11 11

XI. Gross income and expenditure for 1857 and 1858.

1. Gross amount of income from light dues in 1857	£ 30,412 13 5
Miscellaneous receipts	168 1 8
	<u>£30,580 15 1</u>
2. Gross amount of income from light dues in 1858	26,330 3 3
Miscellaneous receipts	534 10 4
	<u>£26,864 13 7</u>
Expenditure in 1857	£ 62,203 16 1
Ditto in 1858	59,746 15 3

The mode of audit is by examination and checking of each individual account.

The name of the auditor is George Steuart, the accountant of the Board before named.

By order of the Board.

ALEX. CUNNINGHAM,
Secretary.

Edinburgh,
22nd Sept. 1859.

(It was thought that these papers were too voluminous to print.)

Royal Commission, Lights, Buoys, and Beacons,
7, Milbank Street, S.W.

17th June 1859.

SIR,—WITH reference to my letter of the 3rd instant, I am directed to state that the Commissioners desire to be furnished with a Return showing,—

XIII. The names of the various local agents and superintendents of districts, the dates of their appointments, their profession or employment at the time of their appointment, the salaries and allowances paid to each.

The Commissioners also desire to be furnished with a Return showing,—

XIV. The number of craft of all denominations maintained by the Commissioners of Northern Lighthouses in the several districts under their control. XVIII.

XV. The number of men employed in such boats or vessels. And, XIX.

XVI. The whole sum expended in Salaries and in maintaining the same. And, XX.

XVII. Also the expense incurred in each year since 1853 in the hire of boats, vessels, &c. XXI.

I am, &c.

(Signed) J. F. CAMPBELL,
The Secretary to the Commissioners of Northern Lighthouses. Secretary.

RETURN, &c.

XIII.—“Local Agents.” XVIII.

The Commissioners of Northern Lighthouses do not employ any local agents or superintendents of districts.

XIV.—Craft of all Denominations maintained by the Commissioners. XVIII.

XII. Detailed amount of expenditure for same periods, mode of audit, and names of auditors.

This detail is given in separate Forms, seventy-two in number, sent herewith (from these the following abstracts have been made):—

DISBURSEMENT ACCOUNT under the Act 16 and 17 Vict., Cap. 131, paid in the Four Quarters ending 31st December, 1857.

	£ s. d.
Maintenance of lighthouses as per Abstract A.	16,669 11 2
Buoys and beacons	802 5 11
Steam and sailing vessels, &c.	6,283 3 9
Office expenses	607 11 10
Salaries of establishment	2,539 3 11
Miscellaneous expenses	925 15 3
Expenses of collection	498 15 8
Superannuation allowances	1,681 6 10
For new works	51,716 1 9
Interest to Government	250 0 0
Balance carried to next Quarter	891 2 5
	<u>£63,094 18 6</u>

DISBURSEMENT ACCOUNT under the Act 16 and 17 Vict., Cap. 131, paid in the Four Quarters ending 31st December, 1858.

	£ s. d.
Maintenance of Lighthouses, as per Abstract A.	16,839 3 2
Buoys and beacons	729 1 0
Steam and sailing vessels, &c.	6,596 18 0
Office expenses	1,282 5 8
Salaries of Establishment	2,582 7 7
Miscellaneous expenses	500 0 1
Expenses of collection	251 19 9
Superannuation allowances	1,479 11 11
For new works	25,125 8 11
Interest to Government	250 0 0
Balance carried to next Quarter	1,394 7 2
	<u>£61,141 2 5</u>

SCOTLAND.
Circular I. Question XVIII.

XVI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XVII.

1. "Pharos," paddle steamer, 250 horse power, 300 registered tonnage.
2. Argyll, Skerryvore, attending vessel, 17 tons.
3. Attending boat Inck Keith.
4. Do. Isle of May at Crail.
5. Do. Bell Rock.
6. Do. Pentland Skerries.

XV.—The Number of Men employed in such vessels.

1. The crew of the "Pharos" consists of—
Master.—Two mates.—Steward.—Two engineers.—Six firemen.—Two coal trimmers.—Eleven seamen.—Carpenter.—Coxswain.—Boatswain.—Cook.—Assistant cook (boy).

2. The crew of the "Argyll" consists of—

Master.—Mate.—Carpenter.—One seaman.

3. The boat for attending Inck Keith is under the charge of a boatman, who employs his own crew, and who, previous to 1856, was paid 8s. per trip, but since then, in order to give his whole time and assist in the storehouse a Granton, receives a salary of 40l. per annum.

4. The boat for attending the Isle of May lighthouse is under the charge of a boatman, who has a salary of 35l. per annum, with a free house. In attending the lighthouse he employs men as circumstances may require, who are generally paid 2s. 6d. per trip.

5. The boat belonging to the Commissioners for attending the Bell Rock lighthouse is under the charge of a boatman who employs a crew and charges by the trip.

6. The boat belonging to the Commissioners for attending the Pentland Skerries lighthouse is under the charge of a boatman, who employs a crew and charges by the trip.

7. At the following fifteen island stations the use of boats are required for supplying the lightkeepers with provisions and other necessaries, but these boats belong to the person in charge of them, who visits the lighthouse as occasion requires, and is paid by the trip. These stations are, Hoy Sound, North Ronaldsay, Whalsey Skerries, North Unst, Cape Wrath, Island Glass, Barrahead, Rona Kyleakin, Lismore, Rhynns of Islay, Ship Rock of Sanda, Pladda, Little Ross, and Calf of Man.

XX. XVI.—The Expense of maintaining the same since 1853.

		"PHAROS."		
		£ s. d.	£ s. d.	
1853.	Wages	-	1,856 11 6	
	Sailing expenses	-	4,173 7 8	5,160 2 2
1854.	Wages	-	1,555 17 2	
	Sailing expenses	-	3,394 19 3	4,950 16 5
1855.	Wages	-	1,998 10 8	
	Sailing expenses	-	3,889 15 10	5,828 6 6
1856.	Wages	-	1,665 16 8	
	Sailing expenses	-	3,970 13 11	5,636 10 7
1857.	Wages	-	1,980 9 10	
	Sailing expenses	-	3,161 0 11	5,141 10 9
1858.	Wages	-	1,686 19 10	
	Sailing expenses	-	4,035 15 11	5,722 15 9
				£32,790 2 2

		"ARGYLL."		
		£ s. d.	£ s. d.	
1853.	Wages	-	350 9 4	
	Sailing expenses	-	486 17 3	847 6 7
1854.	Wages	-	157 10 6	
	Sailing expenses	-	185 11 8	346 1 8
1855.	Wages	-	210 0 6	
	Sailing expenses	-	268 2 5	473 2 5
1856.	Wages	-	210 0 0	
	Sailing expenses	-	354 14 0	464 14 0
1857.	Wages	-	262 10 0	
	Sailing expenses	-	429 14 7	692 4 7
1858.	Wages	-	210 0 0	
	Sailing expenses	-	269 16 3	479 16 3
				£3,303 5 6

XII. XVII.—Expense of hiring boats each year since 1853.

	Inck Keith.	Isle of May.	Bell Rock.	Pentland Skerries.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.
1853	- 16 3 0	68 15 2	79 8 0	38 4 7
1854	- 23 16 0	52 13 10	86 6 5	31 16 0
1855	- 21 12 0	67 12 6	97 11 11	18 9 0
1856	- 47 14 0	70 16 6	83 8 0	19 19 0
1857	- 55 19 5	73 4 0	74 10 6	22 0 0
1858	- 54 14 0	62 11 0	90 2 6	15 6 0
	£ 219 18 5	395 13 0	511 7 4	145 14 7

	Hoy Sound.	North Ronaldsay.*	Whalsey Skerries.
	£ s. d.	£ s. d.	£ s. d.
1853	- 9 18 0	—	—
1854	- 14 0 6	0 8 0	—
1855	- 14 8 0	6 10 0	18 19 11
1856	- 14 8 6	3 2 0	16 16 0
1857	- 8 2 6	—	19 8 0
1858	- 7 17 6	—	21 10 5
	£ 68 15 0	10 0 0	76 14 4

* The boat here was only used during part of 1854, 1855, and part of 1856, when it was discontinued and letters sent on by post office, for which the Commissioners pay 5l. annually.

	North Unst.	Cape Wrath.	Island Glass.*
	£ s. d.	£ s. d.	£ s. d.
1853	- —	15 14 0	—
1854	- —	12 16 2	—
1855	- 132 1 2	11 1 0	2 11 11
1856	- 127 5 2	7 0 0	2 5 0
1857	- 123 11 4	7 1 6	0 15 0
1858	- 104 12 11	7 2 6	1 18 0
	£ 487 10 7	60 15 2	7 9 11

* There is no regular boat at this station. The above are for occasional trips to Stornoway, &c.

	Barrahead.	Rona.	Kyleakin.
	£ s. d.	£ s. d.	£ s. d.
1853	- 53 3 6	—	—
1854	- 64 13 0	—	—
1855	- 86 14 0	—	—
1856	- 33 19 0	—	—
1857	- 40 0 0	3 12 0	—
1858	- 41 16 0	18 8 4	2 14 0
	£ 320 5 6	22 0 4	2 14 0

	Lismore.	Rhynns of Islay.	Ship Rock of Sanda.
	£ s. d.	£ s. d.	£ s. d.
1853	- 16 4 6	8 0 0	11 8 6
1854	- 27 9 10	9 0 4	14 0 0
1855	- 24 5 6	8 0 6	12 0 0
1856	- 21 10 0	8 0 0	12 5 0
1857	- 20 7 0	8 0 0	13 0 0
1858	- 19 16 0	10 0 0	15 0 6
	£ 129 12 10	51 0 10	77 14 0

	Pladda.	Little Ross.	Calf of Man.
	£ s. d.	£ s. d.	£ s. d.
1853	- 12 3 0	16 5 0	14 3 0
1854	- 9 13 10	16 9 0	24 10 0
1855	- 10 12 6	15 0 0	21 11 0
1856	- 12 3 9	15 0 0	26 11 0
1857	- 9 2 6	15 0 0	26 18 0
1858	- 8 2 9	16 2 0	30 7 0
	£ 61 18 4	93 16 0	144 0 0

By Order of the Commissioners,
ALEX. CUNNINGHAM, Secretary.
Edinburgh, 7th July 1859.

VIII. to XXI

CONSTITUTION OF GENERAL AUTHORITY, &c.

XXI.

SCOTLAND.

Royal Commission, Lights, Buoys, and Beacons,
7, Millbank Street, S.W., London,
17th June 1859.

Northern Lighthouse Office,
Edinburgh.

Circular
I.
Question
XXV.

Sir,—With reference to my letter of the 3d instant, I am directed to state that the Commissioners desire to be furnished with a return showing the names of all lighthouse keepers and masters of floating lights appointed since the 1st of January 1854, the date of their appointment; their profession or employment at the time of their appointment; their ages at the time of appointment; their actual employments when appointed; by whom they were selected, and the mode of examination (if any) and of testing their qualifications.

Sir,—The Commissioners of Northern Lighthouses have received an application for your admission to their service as a lightkeeper; and I am directed to enclose a List of Queries, which you will return to me at your earliest convenience, with answers filled up in your own handwriting.

I am, &c.

Secretary.

I am, &c.
(Signed) J. F. CAMPBELL, Secretary.
The Secretary Commissioners of
Northern Lighthouses, Edinburgh.

Queries to be answered by every Candidate for admission to the Lighthouse Service, as a Light-keeper.

1. What is your full christian name and surname?
2. Where were you born, and the date?
3. Are your parents alive, and where do they reside?
4. What is your present employment, and the name of your employer?
5. In what, and whose employments have you previously been?
6. Where were you educated?
7. What branches were you taught?
8. Have you any certificates from your schoolmaster? If so, transmit them.
9. What is the present state of your health?
10. Have you ever been subject to spitting of blood, rupture, or to any fits, or had any severe illnesses? If so, give the name of the doctor who attended you.
11. Have you ever been subject to any complaint in your eyes, or affection of your eyesight? Can you distinguish colours?
12. Are you at all near-sighted, or is your eyesight in all respects perfectly good?
13. Are you aware (and if not, on being admitted to the service, do you agree) that your engagement with the Commissioners will be from day to day during their pleasure, that on cause shown you may be instantly dismissed, and that you in that case are to have no claim for wages, past, or future, beyond what may have been paid to you at the previous quarter?
14. Are you aware of the arduous and very responsible nature of the duties of a light-keeper, and that it requires great resolution and steadiness to discharge them?
15. Are you aware (and if not, on being admitted, do you agree) that you have agreed to take watch in the light-room, and that on your going to sleep while on duty, or that on any neglect or want of vigilance on your part, by which the light may be extinguished, or its due exhibition may be endangered, you will be instantly dismissed from the service?
16. Are you willing, and on being admitted, do you agree, to give implicit and constant obedience to the principal light-keeper under whom you may be appointed to serve, and to your superiors in all matters connected with the service, and to attend to all instructions which may be given to you?
17. Are you aware (and on being admitted, do you agree), that you must go to whatever lighthouse station the Board may name, and subsequently to any other station which they may direct, on a change being considered right, and that a refusal on your part to go to such station will subject you to instant dismissal?
18. Are you married or single?
19. If married, how long have you been so, and what family have you?
20. How long have you known Mr. _____, who forwards your application to the Board?

I am, &c.
(Signed) J. F. CAMPBELL, Secretary.

XII. XVIII. LIST OF LIGHTKEEPERS appointed since 1st Jan. 1854, the Date, their Profession and Ages.

Name.	Date.	Employment.	Age at Date of Appointment.
John Birnie	10th May 1854	Not known	25
Alexr. McRae	"	"	25
Thos. Grierson	"	"	27
Wm. McLellan	"	"	24
John Alexander	"	"	24
Robt. Watson	4th Oct. 1854	"	24
William Mills	"	"	23
William Gordon	"	"	24
James Blyth	"	"	24
James Taylor	"	"	28
Joseph Agnew	"	"	28
William Crow	"	"	28
A. Nisbet	29th Dec. 1854	"	25
J. Macdonald	11th July 1855	"	25
J. Macdonald	12th Jan. 1856	"	25
Alan Auld	"	"	25
James Ewing	16th July 1856	"	25
George Gallie	"	"	23
Hardie Ross	— Sept. 1856	"	23
D. McLaren	30th Oct. 1856	"	23
James Thomson	30th Nov. 1856	"	21
J. C. Tomison	11th March 1857	"	24
Robt. Laidlaw	15th July 1857	"	26
Patrick Reid	"	"	21
James Baird	"	"	24
Alexr. Georgeson	"	"	25
David Ross	"	"	29
Wm. Gutcher	"	"	28
Robt. Pease	"	"	25
D. Laidlaw	"	"	24
Charles Christian	"	"	27
Robt. Grierson	"	"	27
W. A. Mackay	17th Feb. 1858	"	24
D. Charleson	"	"	25
J. Youngclaus	"	"	24
Wm. Anderson	"	"	25
G. McLauchlan	"	"	28
Alexr. Greig	"	"	27
James Hawthorn	"	"	21
James Tack	25th Dec. 1858	"	24

Note.—The Commissioners keep no record of the employments of their lightkeepers.

XIII. XIX. Master of Floating Lights.

Nil.

XX. By whom appointed.

The Commissioners of Northern Lighthouses.

XV. XXI. Mode of Examination and testing.

When an individual applies for admission into the service, he is required to fill up the Schedule No. 1 herewith produced, and the party recommending him, the Schedule No. 2. If he is admitted, his name is then placed on the list of Applicants, and the Letter No. 3 is sent to him.

In his turn he is sent for three months education in the duty of a lightkeeper, one half to a catoptric, the other to a dioptric lighthouse, according to the accompanying forms of letters, No. 4 to the candidate, and No. 5 to the lightkeepers; and, if they certify favourably of him, his name is then transferred to the "Expectant" list, from which, in his turn, he is drafted into the service according to letter No. 6.

No person is appointed a lightkeeper under 21 or above 30 years of age.

When a lightkeeper is admitted his life is insured by a policy taken in name of the Commissioners (3*l.* being retained for this purpose from his salary) and he receives a copy of the circular No. 7.

Edinburgh, 7th July 1859.

By order of the Commissioners.

ALEX. CUNINGHAM, Secretary.

I, _____, applicant for admission to the service of the Commissioners of Northern Lighthouses as a light-keeper, do hereby declare that I have inserted, with my own hand, answers to the preceding queries, and that I am willing and bind myself to serve the said Commissioners faithfully, under the conditions above set forth.

Sign here

Date

Northern Lighthouse Office,
Edinburgh.

Sir,—An application having been received by the Commissioners of Northern Lighthouses for the admission of _____ into their service as a lightkeeper, it is observed that you recommend him for the appointment, and I am directed to transmit enclosed a paper of queries, which you will return to me as soon as possible, with the answers filled up.

I am, &c.

Secretary.

SCOTLAND.

XXI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XXI.

Circular
1.
Question
XXV.

Queries to be answered by any one recommending the admission of a Light-keeper into the Lighthouse Service.

1. Have you any knowledge of the candidate whom you recommend?
2. How long have you known about him?
3. What is his present employment, and the name of his employer?
4. Has he been previously employed under any other person?
5. How has he conducted himself in such employment?
6. Is he sober, honest, obliging, obedient to authority, and clearly in his dress and person?
7. Do you know the parents of the candidate, and what character do they bear? How long have you known them?
8. When did you last see the candidate, previous to forwarding your recommendation?
9. Is he able-bodied, of a healthy constitution, and free from any deformity of body?
10. Is his eyesight good and free from any defect? Is he near-sighted?
11. Do you know whether he, his parents, or any of his near relations, have ever displayed any symptoms of insanity or eccentricity of character?

Sign here

Date

Northern Lighthouse Office,
Edinburgh.

Sir,—Having laid before the Commissioners of Northern Lighthouses your application to be admitted to the service as a light-keeper. I have to inform you that your name has been placed on the list of candidates, until your turn shall come to be sent for instruction in the duties of a light-keeper.

When your turn does come, of which you will receive due notice, you will require to be three months from home, which will be divided equally in attendance for instruction at two lighthouses with different species of lighting apparatus. If, during the term of residence there, your conduct be satisfactory, both in acquiring instruction and in your general demeanour, of which intimation will be sent to the Commissioners, your name will be transferred from the list of candidates to the list of "expectant light-keepers." From this list, as vacancies occur, you will, when your turn comes, be appointed as assistant light-keeper, and your station named.

If your conduct, while under instruction, be such as to warrant your name being put on the expectant list, as above, you will be allowed your travelling expenses to and from the stations; but no wages for the time you are under instruction. Should you fail in getting your name put on the expectant list, you must distinctly understand that you will receive no allowance whatever.

Please acknowledge receipt of this letter.

I am, &c.,

Secretary.

Northern Lighthouse Office,
Edinburgh.

Sir,—With reference to my letter of intimating that the Commissioners of Northern Lighthouses had placed your name on the list of candidates for admission to the service as a light-keeper, I have now to acquaint you, that your time has come for being sent for instruction, and you will require to come here as soon as possible, when you will receive further directions.

I have to refer you to my previous letter, as to the terms on which you will be allowed your travelling expenses. You must keep a full and particular note of all these travelling expenses, in the form of which a copy is enclosed. Should you have occasion to pay out any sums for cart hire, carriage of extra luggage, &c., you must be careful to get *ouchers* for the same, and transmit them to me, along with your account. You will be allowed second-class fare in railways, and second-class fare in steamers, and 4s. 6d. per day, for board and lodging, while travelling.

Acknowledge receipt of this letter, and state what day you may be expected here,

I am, &c.,

Secretary.

Northern Lighthouse Office,
Edinburgh.

Sir,—I am directed by the Commissioners of Northern Lighthouses to send to you the bearer

in order that you may duly instruct him in the duties of a light-keeper, during six weeks from the date of his arrival, in conformity with the Board's rules, of which a copy is annexed.

He will board with you, for which you will be allowed the authorized rate of charge.

I am, &c.,

The Principal Light-keeper
at

Secretary.

RULES to be observed in educating Applicants for Admission into the Lighthouse Service.

1. After the arrival of the learner, who will in every case bear a letter of authority from the secretary, it is the first duty of the principal light-keeper to call his attention to the light-keeper's instructions—particularly cautioning him as to the responsibility he is undertaking, and the *invariable rule* of the Commissioners, that if he goes to sleep at his post, he will not be admitted to the service.

2. The usual period for instruction, unless otherwise ordered, is to be six weeks at a lens light, and six weeks at a reflector light. During these respective periods, the learner will be instructed in the full duties of the light-room, and in the whole duties to be performed by a light-keeper generally, as well in relation to other parts of the premises as in the lightroom.

3. When at a lens lighthouse station, he must, in addition to his general duties, be specially instructed in the management of the lamp, in trimming the wicks, in removing the leather valves of the pumps. Also in cleaning the lenses and mirrors.

4. When at a reflector lighthouse station, he must, in addition to the general duties, be specially instructed in the cleaning of the reflectors, the trimming and management of the lamps.

5. He must be fully instructed to keep the journal, and other books of the establishment which may be in use during his stay at the station. For this purpose he should be directed to make the entries in them, to read off the barometer and thermometer and rain gauge, and enter the same.

6. He should in every case be called upon to write, if not the whole, at least a portion of the monthly return, transmitted to the secretary during his stay, so that a specimen of his handwriting may be seen at head quarters.

7. He must be cleanly in his dress, sober, active, and attentive, and conform in all respects to the principal light-keeper's instructions.

8. It is desirable that, during the first four weeks of his attendance, a learner should keep watch along with the principal light-keeper.

9. During the two last weeks of his attendance, he may keep watch either along with the principal or assistant light-keeper, as may be arranged, but during these two weeks he is to do the whole duties of the lightroom during his watch,—the light-keeper attending to aid or advise him in case of any difficulty.

10. It is to be distinctly understood, that at no time is the lightroom to be left under the charge of a learner, without the attendance of one of the light-keepers who will be held responsible for any defect which may occur, in the due maintenance of the light, from the neglect or inadvertence of a learner under instruction.

11. If any neglect of duty, disobedience of orders, or of these instructions, or any disrespectful or irregular conduct, occurs on the part of a learner, during the period of his instruction, the same is to be forthwith reported to the secretary.

12. If, at the expiration of the period of his instruction, the principal light-keeper has reason to be satisfied with the learner's proficiency and general demeanour, he shall transmit a certificate to that effect, as nearly as circumstances admit, in the terms annexed, by post to the secretary in Edinburgh. If not considered in any respect qualified, the certificate must be altered accordingly.

13. Upon receipt of this certificate, the principal light-keeper shall be entitled to a fee of 1*l.* 1*s.*, and the assistants to a fee of 10*s.* 6*d.* each.

Lighthouse.

Sir,—I hereby certify that _____ has resided for _____ days at this lighthouse, during which time he has been fully instructed in the whole duties of a light-keeper, in terms of the Board's directions in that behalf, and I consider him duly qualified to take charge of a light, as assistant light-keeper; I have also to certify, that during his stay he has been at all times attentive to his

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CONSTITUTION OF GENERAL AUTHORITY, &c.

instruction, cleanly, sober, and respectful, and I have every reason to be satisfied with his general demeanour.

I am, &c.,

Principal Light-keeper.

To the Secretary,
Northern Lighthouse Office,
Edinburgh.

Northern Lighthouse Office,
Edinburgh,

Sir,—Having received from the principal lightkeepers in charge satisfactory certificates of your progress while under instruction, and of your general conduct while at the light-house stations, I have to inform you, that the Commissioners of Northern Lighthouses have placed your name on the list of "expectant lightkeepers," from which you will be called into the service as assistant lightkeeper, when a vacancy occurs; and you will then be required to give a statement of your occupation from this time.

Should you, when a vacancy is intimated, be engaged in any employment which prevents your accepting your appointment, you will be passed over, and receive, on the next vacancy a second intimation; but should you then decline to accept, your name will be struck off the list.

If you should attain the age of thirty before an opening occurs, your name will be struck off the list.

I am, &c.,

Secretary.

Northern Lighthouse Office,
Edinburgh,

Sir,—With reference to your appointment as a light-keeper, recently made by the Board, I am directed to acquaint you, that although your salary is 40*l.*, yet that the sum of 3*l.* will in each year after 12th November next be retained by half-yearly instalments, for the purpose of repaying an annual premium for an insurance on your life, under the regulations, of which a copy is annexed.

The quarterly payments of salary will therefore be made to you as follows:

Quarter ending 1st January	- - -	£10 0 0
" " 1st April	- - -	8 10 0
" " 1st July	- - -	10 0 0
" " 1st October	- - -	8 10 0
		37 0 0

In pursuance of this arrangement, I have now to acquaint you that a policy has been taken out from the Edinburgh Life Insurance Company for the sum of *l.* payable after your death. The policy, which is in the name of the Commissioners, is dated , and N^o , and is delivered to me to be retained for your behoof.

In making this intimation to you, I am directed to call your attention in a particular manner to the regulations. The sum contained in the policies, you will observe, falls to be paid after your death to the Commissioners, in whose name the policies are taken; and as the money is to be applied by them, it is very desirable that you should leave some written directions behind you as to the manner in which you would wish the money disposed of for behoof of your family. This may be done in the simplest manner, either by a letter addressed to the secretary of the Board, to any member of your family, or to any friend, which, after being written and signed, should be laid aside in your repositories, where it may be found after your decease.

By order of the Board,

Secretary.

To Assistant light-keeper
at

REGULATIONS as to Insurance on Keepers Lives.

1. That the addition made to the salaries of the lightkeepers by Minute of 5th February 1839 shall in no event be payable to or assignable by any keeper, or attachable by his creditors.

2. That this addition made to the keepers' salaries shall, as heretofore, be employed in paying an annual premium on a policy of insurance on their respective lives, for such a sum as can be obtained for such premium, in reference to the age of the party insured; the policy of such insurance to be taken in name of the Commissioners, and the sums contained in them to be payable to the Commissioners after the death of the keeper.

3. That it shall be competent to every light-keeper, at any time during his life, by any writing under his hand, either in the form of a letter to the secretary, or otherwise, to direct in what manner he would wish the sum arising from his policy of insurance, at his death, to be applied for

II.

X

XXVI.

SCOTLAND.

Circular I.
Question
XXV.

the benefit of his wife and family; but it is to be understood that the Board consider it inexpedient that in any case they should retain the sum coming into their hands for behoof of such widow or family; and that in the event of no written directions being left, the Board will apply such sums for behoof of the widow or family, one or both, at their discretion, in such way as they may think most beneficial, without having regard to the manner in which such sums might fall to be divided at common law.

4. That in the event of no such directions for behoof of the widow and family being left by the keeper, the policies, and sums arising from them, shall be held by the Board exclusive of the creditors or other assignees of the deceased keeper, the object being to provide a fund to the widow and family, where such are left.

5. That in the event of any keeper being at any time dismissed from, or leaving, the service of the Board, he is to have no claim on the policy, nor for the annual premiums paid, nor for its value,—the same, in that case, being entirely at the disposal of the Board; with power to them, nevertheless, if they shall see cause to give up the policy to the party dismissed or leaving the service, or to his family, or to give its value, or otherwise to dispose of it.

6. That in the event of any light-keeper dying, and leaving no wife and family, the Board will still apply the sums coming into their hands in terms of any written directions he may leave; but failing such, and his dying intestate, the Board will leave the insurance office to settle with his next of kin according to the usual forms of law.

7. That from the salary of every light-keeper, hereafter entering the service, a sum of 3*l.* shall be retained annually to effect an insurance on his life, subject to the above conditions.

XXVI. SUPPLEMENTARY RETURN of improvements suggested to the Commissioners of Northern Lighthouses, with a statement of the steps taken. (Original return pre-fixed to volume of drawings furnished by the Commissioners.)

XXVI.

1. Gerard's reflector.—8th June, 1846.—Letter from Sheriff Lumsden, recommending an inquiry into the merits of Gerard's reflector, and enclosing a letter from the provost of Aberdeen with a sketch of the lantern, &c.

10th May, 1847.—Letter from Mr. Gerard enclosing report of shipmasters in favour of his reflector.

13th May, 1847.—Answer by engineer (Alan Stevenson, Esq.) saying, he sees nothing to encourage Mr. Gerard prosecuting his experiments.

May, 1848.—Further correspondence from Mr. Gerard, urging merits of his reflector.

3d June, 1848.—Letter from Alan Stevenson, Esq. to Mr. Gerard, saying, he would endeavour to have a conference with him.

June, 1848.—Letter from Alan Stevenson, Esq. to the Commissioners of Northern Lighthouses proposing to test the reflector in comparison with a lens-light.

7th June, 1848.—Meeting, "authorise Mr. Stevenson to meet Mr. Gerard, to institute comparative trials of the reflector, incurring such expense as he might think reasonable in relation thereto, and to report the result to the Board."

20th and 26th September, 1848.—Letters from Alan Stevenson, Esq. to the Commissioners as to expense of instituting comparative trials.

18th October, 1848.—Meeting authorised the sum of 100*l.* to be placed at the disposal of the engineer for this purpose.

December, 1848.—Engineer reports (annual report for 1848-9) that he has made arrangements for a trial of the light in contrast with that of Coveasa Skerries.

16th July, 1849.—Letter from Alan Stevenson, Esq., enclosing a note from Mr. Gerard regarding first trial of the heat reflector.

1st October, 1849.—Report by the engineer decidedly in favour of the lens light at Coveasa.

3rd October, 1849.—Meeting direct no further experiments to be made.

11. Herbert's lamp for colza oil.
6th May, 1847.—Letter from Mr. Herbert of the Trinity House, regarding his new lamp for Colza. Remitted to engineer to report upon.

8th June, 1847.—Report by engineer stating that Mr. Herbert's lamp and that used by the Commissioners had been carefully experimental

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—
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COPY.

upon, and suggesting that a dozen of Mr. Herbert's burners should be procured with a view to test by actual trial in a lighthouse.

December, 1848.—Annual report, 1848-9, after a year's trial at the Bell Rock. The engineer does not recommend the lamp to be adopted.

III. Voltaic light.—23rd November, 1848.—Letter from engineer to the Commissioners in reference to Straite and Petrie's voltaic light, smallness of luminous point, a defect which he fears could not easily be remedied, directed to correspond with inventor as to instituting a trial.

December, 1848.—Engineer reports (annual report 1848-9) that he has had some correspondence regarding this light, but is not yet in a position to make any proposal as to a trial of the light.

IV. Illuminated numerals.—10th June, 1850.—Letter from Alan Stevenson, Esq. to the Commissioners regarding Mr. Meek's system of numerical lights. Experiments proved that these numerals (25 inches high by about 16 inches wide) could be identified at fully 1000 yards distance. Whether these distances should warrant their exhibition to the mariner, he could not, under the present state of his information, determine.

21st November, 1851.—Letter from Mr. Babbage with notes explanatory of his system of distinguishing lights by numerals, &c. Remitted to engineer to report.

6th December, 1851.—Report by engineer to the effect that power is of more importance than distinction in lighthouses, and as the northern lighthouses are sufficiently distinguished in character already, it is not expedient to adopt Mr. Babbage's system, as it would have the effect of greatly sacrificing power to distinction.

24th December, 1851.—Letter to Mr. Babbage stating that the Commissioners do not deem it expedient to adopt his system.

11th November, 1852.—Letter from Messrs. Stevenson, engineers to the Board, enclosing letter from Professor Bache of American lighthouse Board, requesting a copy of the report on Mr. Babbage's plan.

17th November, 1852.—Meeting authorise a detailed statement to be sent to the American Board.

29th January, 1853.—Statement sent embodying the reasons why the Commissioners rejected Mr. Babbage's system.

1st March, 1853.—Letter from American Board acknowledging receipt with thanks.

21st December, 1855.—Secretary "authorised to communicate to the hydrographer of the "Admiralty a copy of the Commissioners report "on Mr. Babbage's plan for distinguishing light-houses."

29th December, 1855.—Letter from Captain Washington thanking Commissioners for their report.

V. Electric light.—15th June, 1853.—Engineer submitted to the meeting a pamphlet on the electric light, as to which he had been making some inquiries. Meeting direct him to continue his inquiries. Report.

16th June, 1853.—Letter from patentee (Dr. Watson) of new electric light, explaining process of exhibition, expenses connected therewith, &c.

27th June, 1853.—Report by engineer as to its merits, and stating that the Trinity House had remitted the subject to Professor Faraday to report thereon, but at present there are two objections to its adoption, viz., the smallness of luminous point of light, and its enormous expense in comparison with oil.

Proceedings delayed till Mr. Faraday's report is known.

December, 1853.—Engineer reports (annual report 1853-4) that owing to above reasons, it cannot in its present state be adopted with advantage.

VI. Improvement in lighthouses.—10th February, 1855.—Letter from Mr. W. Fletcher, Cald, Irnby, Wales, suggesting improvements in the construction of lighthouses.

23d February.—Written to, to send his plans.

28th March.—His plans submitted, and declined to be adopted, as they contained nothing new.

REPORT as to EXPERIMENTS ON RED LIGHT, by Messrs. D. and T. Stevenson, Engineers to the Board.

The characteristic colour of first class dioptric red lights, such as Sanna and Ushenish, has hitherto been produced by placing frames containing red glass within the windows of the lantern. This arrangement has certain disadvantages. One of these is that the light has to pass through the additional surfaces of the red shade; another and more serious evil is, that in consequence of the close proximity of the red shades to the window glass of the lantern, and the consequent want of sufficient ventilation between them, it is found that in certain states of the temperature and atmosphere, condensation takes place on their inner surfaces, a film of moisture is formed, and the light is materially absorbed in passing through these dim surfaces. In order to remedy this defect, we proposed to Messrs. Chance, of Birmingham, to colour the thick plate window-glass of the lanterns; but this was stated to be impracticable, as the glass of which the window panes are formed is cast, and a thin film of red glass cannot be incorporated with it, and being plate-glass it cannot be stained. Ruby glass on the other hand, which is all blown, cannot be made more than $\frac{3}{16}$ of an inch thick, and is, therefore, too thin to be used for glazing lanterns. Our next proposal was to colour the large chimnies used for the first-class four wick'd lamps. The red colour of catoptric lights from reflectors, with small argand burners, has long been produced by using red chimnies; but the same plan, so far as we are aware, has not yet been employed for the large chimnies used in first-class dioptric lights.

Some difficulties occurred in manufacturing the red chimnies for the large lamp, and we communicated on the subject with Mr. Ford, of Edinburgh, and Messrs. Chance, of Birmingham, both of whom submitted specimens of their work. Messrs. Chance, after several trials, ultimately succeeded in making glasses of good colour and at a moderate cost. In order to test the efficiency of these chimnies as compared to the shades at present in use, and other suggestions for effecting the object in view, we instituted a series of experiments which we may briefly explain.

A first-class wick'd mechanical lamp was placed in the experimental lightroom at Inchkeith, in the focus of an annular lens, which was directed towards the Calton Hill, distant about 5½ miles; and the following coloured media were exhibited in succession:—

- 1st. A large red shade interposed between the lens and the pane of the lantern; the arrangement hitherto in use.
- 2d. A small red shade interposed between the lens and the lamp.
- 3d. A cylinder, 12 inches in diameter, and 32 inches in length, placed outside the chimney of the lamp.
- 4th. A coloured chimney of flashed ruby glass of pink colour (the tint produced by gold.)
- 5th. A coloured chimney of homogeneous ruby glass of bright red colour (the tint produced by gold.)
- 6th. A coloured chimney of homogeneous glass of dark red colour (the tint produced by copper.)

These different shades and chimnies were exhibited twice on each evening for three successive nights, the order in which the apparatus was used being on each occasion altered and not known to the observers. The lights were observed on the first night by two, and on the two last nights by three independent observers stationed on the Calton Hill and Royal Terrace, the whole number of independent observations being 16 on each light.

A careful review of these observations shows that the characteristic of a first class dioptric red light can be secured by the use of the red chimnies which Messrs. Chance have succeeded in manufacturing, and that the disadvantages attending the use of the red shade, consequent on the transmission of the light through an additional pane of glass, and the condensation may be avoided; a very important improvement on the present system. The following is the result of the observations made, the different kinds of ap-

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paratus experimented on, being set down in their order, number 1 being the best red light—
1st. Chimney of homogeneous gold ruby glass (bright red.)
2d. Chimney or flashed gold ruby glass (pink colour.)
3rd. Red shade between lens and lantern panes, the same as now in use.)
4th. Red shade, between lens and lamp.
5th. Red cylinder outside of lamp chimney.
6th. Chimney of homogeneous glass, dark red, (tint produced by copper.)
Of these Nos. 1 and 2 were the best lights; 3 and 4, were also good lights, but not equal to the first; Nos. 5 and 6 were decidedly inferior, particularly as regards size.
We have, therefore, to recommend to the Board to order a year's supply of glasses of the tint and

quality referred to in No 1.; and that they should be tried in Ushenish lighthouse. It is worthy of remark that the flashed glasses No. 2, which are made by introducing a thin film of ruby glass between two films of colourless glass, and which we feared might not stand the heat, were found to stand quite as well as those which were made of homogeneous glass.
We think it would also be desirable to follow out this suggestion by getting some of the small argand chimnies made of homogeneous ruby glass to be tried in a reflector, and compared with the chimnies now in use, which are stained by a very tedious process, and are more costly than the homogeneous glasses would be.
(Signed) D. and T. STEVENSON.
Edinburgh, 20th March, 1860.

CIRCULAR No. II.—LIGHTHOUSES.—GENERAL RETURN.

Circular II.

- I. The Commissioners of Northern Lighthouses, Edinburgh.
- II. Chart, with list sent. Special Returns to be sent.
- III. The Commissioners refer to Mr. Stevenson's Rudimentary Treatise on Lighthouses, Part II., p. 155, as embodying the general principles founded on the experience of the Board.
- IV. Should not, if possible, exceed 200 feet, but 150 feet is sufficient under almost any circumstances to give the range required. This, however, is controlled by each locality. See Rudimentary Treatise, p. 156.
- V. Catoptric, dioptric, catadioptric, holophotal, azimuthal-condensing, apparent.
- VI. Visibility, and distinction from adjoining lights, and the adoption of such apparatus as in each situation will secure economy combined with the best effects that can be produced from the flame.
- VII. Fixed, revolving, flashing, intermittent, double lights, revolving alternate colours.
- VIII. See Mr. Stevenson's Treatise, p. 155, et seq.
- IX. Sent.
- X. See below.

- XI. All stores are supplied by open contract, conform to samples exhibited, and they are tested by examination on receipt into the store. The oil is tested by samples furnished anonymously previous to opening offers, and the tests are burning, freezing, photometrical observations, (vide Treatises, p. 177), and chemical analysis.
- XII. From the uncertainty of estimating correctly the direction of sound, no fog signals have been used by the Board, excepting in the cases of Bell Rock and Skerryvore, where bells are tolled by the machinery of the revolving light every half minute, simply with the view of indicating to vessels the proximity of danger, and putting them on their guard.
- XIII. None.
- XIV. Nature and dates of any memorials or applications for lighthouses on new or old sites, since January 1845, and nature and dates of replies.

St. Abbs Head.

TABLE OF PRICES.	
Catoptric.	Price - - - - Fixed.*
	Ordinary repairs (annual) - 11l.
18 Burners.	Oil - { Consumption - 19-6 gallons. for 100 hours } Cost - - - - 3l. 5s. 4d.
	Wicks - { Consumption - 54 wicks. Cost - - - - 1s. 3d.
Catoptric.	Price - - - - Flashing.*
	Ordinary repairs - 12l.
24 Burners.	Oil - { Consumption - 2-22 gallons. Cost - - - - 3l. 14s.
	Wicks - { Consumption - 72 wicks. Cost - - - - 1s. 8d.
Catoptric.	Price - - - - Revolving.*
	Ordinary repairs - 10l. 13s. 4d.
16 Burners.	Oil - { Consumption 17 gallons. Cost - - - - 2l. 16s. 8d.
	Wicks - { Consumption 48 wicks. Cost - - - - 1s. 13d.
Dioptric.	Price - - - - Revolving.*
	Ordinary repairs - 10l. 4s.
1st Order.	Oil - { Consumption - 20 gallons. Cost - - - - 3l. 6s. 8d.
	1 Burner.
4 Wicks.	
	Dioptric.
2nd Order.	
	1 Burner.
3 Wicks.	
	Dioptric.
1st Class.	
	1 Burner.
2 Wicks.	
	Dioptric.
4th Order.	
	2nd Class.
1 Burner.	
	2 Wicks.

Consumption of oil and wicks the same whether the light be fixed or revolving.

* See the Drawings furnished in Answer to No. XI. of this Return.

- 1. 31st December, 1857.—Letter to Board of Trade as to wreck of "Martello," &c. on the Carr Rock, and suggesting Fitness and St. Abbs Head as suitable sites for lighthouses to guide vessels into the Firth of Forth.
- 2. 18th January, 1858.—Answer from Board of Trade stating that proposal ought to have come through the Trinity House, and that they are not prepared to sanction a light on Finess.
- 3. 23d January, 1858.—Reply from Commissioners, stating that they will cause Messrs. Stevenson to make a survey, &c.
- 4. 27th January, 1858.—Answer from Board of Trade, stating that Commissioners should not in the first instance direct a survey to be made, but should, from ample materials already in their possession make the proposal to the Trinity House for such lights as they think desirable.
- 5. 4th February, 1858.—Reply to the Board of Trade, stating that the Commissioners had no materials, and would require a report from Messrs. Stevenson.
- 6. 23d February, 1858.—Letter from Board of Trade, stating that a Committee would visit the locality.
- 7. 8th March, 1858.—Letters to Trinity House and Board of Trade, transmitting copies of previous correspondence.
- 8. 24th March, 1858.—Letter to Board of Trade, still desiring sanction to survey.
- 9. 28th April, 1858.—Letter to Board of Trade, stating that a deputation of the Commissioners, with Messrs. Stevenson, will be ready to receive the Elder Brethren, as to a light in Frith of Forth.
- 10. 29th April, 1858.—Letter from the Trinity House, giving date of the intended visit to St. Abbs Head.
- 11. 19th May, 1858.—Committee reported on the meeting which had taken place at St. Abbs Head on the 17th instant, and resolved to erect a lighthouse on St. Abbs Head.
- 12. 19th May, 1858.—Letter to Trinity House for sanction.
- 13. 26th May, 1858.—Answer from Trinity House, conveying sanction.
Lighthouse now in course of erection.

Oxcares.

1. December, 1847.—Memorials from ship owners, &c. of Grangemouth, Alloa, Kincairdine, and Borrowstowness, as to a light on Oxcares, remitted to engineer.
2. 6th December, 1847.—Letter from Chairman of Forth and Clyde Navigation Company, regarding the above memorial, and urging the importance of a light. Remitted to Engineer.
3. 20th February, 1849.—Letter from John Laing, desiring to know on part of Memorialists if a lighthouse is to be erected.
4. 22d February, 1849.—Answer, stating that the finances will preclude the erection of lighthouses for some time.
5. 25th September, 1855.—Letter from John Laing, urging the necessity for a light.
6. 10th November, 1855.—Answer, stating that this matter had been under the notice of Government, and for the present there was no prospect of work being undertaken.

Fifeness.

1. 31st December, 1857.—Letter to Board of Trade, adverting to loss of two steamers, Fifth of Forth, last year, and pointing out practicability of a lighthouse on Fifeness.
2. 18th January, 1858.—Answer from Board of Trade, stating that proposal ought to have come through the Trinity House, and that they are not prepared to sanction the proposed light on Fifeness.
3. 23d January, 1858.—Reply by Commissioners, stating that my Lords have misapprehended purport of their letter, what they suggested was, that a survey should be obtained with a view of obtaining probable cost of lighthouse.
4. 27th January, 1858.—Answer from Board of Trade, stating that Commissioners should not incur expense of a survey which might turn out to be entirely useless until they have received sanction of Trinity House to erect a lighthouse.
5. 4th February 1858.—Reply by Commissioners, stating that they have no materials to enable them to submit any definite proposal to the Elder Brethren, and that the statute requires them in making such an application, to state fully the nature of the work proposed to be undertaken, and their reasons for doing so.
6. 23d February, 1858.—Letter from Board of Trade, stating that Elder Brethren will shortly visit the locality, with a view of selecting a site.
7. 8th March, 1858.—Answer from Commissioners, stating that they had sent to Elder Brethren copy of the correspondence which had passed between them on this subject.
8. 18th March, 1858.—Reply from Board of Trade, regretting misunderstanding which appears to have arisen on this subject.

River Ness.

1. 24th March, 1855.—Application from Clerk of Harbour Trustees, Inverness, for light at mouth of River Ness.
2. 28th March, 1855.—Letter to Clerk of Harbour Trustees, wishing to be informed whether the position referred to for the light, is not locally situated within the bounds of Inverness harbour. Answered that it was, and light refused.

Nosshead.

- See also Parliamentary Report on lighthouses, 1845, Appendix No. 22, p. 556 (Caithness, S. E. coast). After much discussion regarding comparative merits of Sarclethead and Nosshead, as the site, the Queen issued an Order in Council, that the light be placed on Nosshead, 21st January, 1846.
- Erected and light exhibited, 1849.

Holbornhead.

1. 2d December, 1846.—Memorial of Trustees of Scabster Harbour, for a light to open up the anchorage, remitted to engineer to report.
2. 28th April, 1848.—Letter from engineer, with extract letter from Mr. Sinclair, of Forss, 18th April, 1848, urging necessity for light.

3. 24th May, 1848.—Letter to Mr. Sinclair, stating that a deputation of the Commissioners will visit the locality.
 4. 26th June, 1848.—Letter to Trinity House, regarding new lighthouses, and stating that Holborn can only be regarded as a local light.
 5. 24th December, 1856.—Secretary directed at meeting to write to Board of Trade for instructions.
 6. 5th February, 1857.—Letter from Trinity House, conveying sanction to erect lighthouse.
 7. 12th February, 1859.—Letter from Board of Trade, conveying sanction.
- Matter postponed, owing to disagreement about ground. A full copy of the correspondence has been sent to the Commissioners.

Cantickhead.

1. 29th January, 1848.—Recommendation for a light in letter from Lieutenant Thomson, R.N.
 2. 26th June, 1848.—Letter from Trinity House, with reference to Lieutenant Thomson's recommendation, and agreeing with him as to importance of having a light.
 3. 26th October, 1853.—Engineer proposes that a light should be erected. Approved.
 4. 16th November, 1853.—Meeting resolved to erect a lighthouse.
 5. 1st December, 1853.—Letters to Trinity House and Board of Trade for sanction.
 6. 23d May, 1854.—Letter from Board of Trade conveying sanction.
 7. 2d April, 1856.—Contract for building the lighthouse to be entered into.
- Erected and light exhibited 1858.

Hoy Sound.

- See also Parliamentary Report on Lighthouses 1845, appendix p. 557.
- 7th December, 1846.—Trinity House approved of erecting lighthouses.
- Erected and lights exhibited 1851.

Grimsness Head.

1. May, 1855.—Petition from fish curers, fishermen, and others in the Orkney Islands for a light on Grimsness Head, in South Ronaldshay, as a guide to fishermen coming in from sea to the herring fishing stations.
2. 30th May, 1855.—Stating that the Commissioners cannot undertake to erect any lighthouse of a temporary character, such as is wanted.

Orkney.

- Thieves Holm. Hellyar Holm.
1. 16th September, 1858.—Memorial from Manager and Directors of Aberdeen Shipping Company, to have a light in Shapinska Sound.
 2. October, 1858.—Memorial from Harbour Trustees of Kirkwall, as to importance of light on Thieves Holm, to lead into Kirkwall Bay, &c., or on headland of Durness.
 3. December, 1858.—Joint memorial from commissioners of supply, and road trustees of Orkney for light on Thievesholm, as it would conduce to the safety of vessels navigating Orkney islands.
 4. 3d January, 1859.—Report by Messrs. Stevenson on merits of Thieves Holm and Hellyar Holm, but stating that the relative costs of a light on either site would be found to have considerable weight in coming to a conclusion.
 5. March, 1859.—Petition from ship owners, ship master and pilots of Kirkwall, and others (65 signatures appended) urging a light.
 6. 7th December, 1859.—Report by Engineers that they had made survey, and recommend a small light on Hellyar Holm. Secretary directed to intimate to petitioners that the Commissioners are of opinion that Hellyar Holm is the proper site, in order that they may have an opportunity of forwarding observations.
 7. 8th December, 1859.—Letter to Mr. Aytoun, sheriff of Orkney, stating that Hellyar Holm appears to Commissioners to be the best site.
 8. 3rd January, 1860.—Answer from Mr. Aytoun, conveying observations in favour of Thievesholm, as the best site.
 9. 12th January, 1860.—Letter from Mr. Aytoun, enclosing extract of minute of commissioners of supply of Orkney, detailing the superior advantages of Thievesholm.

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10. 12th January, 1860.—Letter from Mr. Frazer, Kirkwall, enclosing excerpt from minutes of trustees for Orkney roads, in favour of Thievesholm.

11. 17th January, 1860.—Letter from Mr. Scarth, Lloyds agent, Kirkwall, stating that the general opinion of shipmasters is in favour of Thievesholm.

12. 31st January, 1860.—Supplementary report by Messrs. Stevenson, that as the question is entirely as to lighting Shapinsha Sound and the String, they are still of opinion that Hellyar Holm is the best site.

The whole subject re-committed to Messrs. Stevenson, as when this report was written by them, they had not before them the last letters on the subject.

13. 11th February, 1860.—Further supplementary report by Messrs. Stevenson, still in favour of Hellyar Holm.

14. Letter from Mr. Aytoun, 25th February, 1860, conveying further opinions in favour of Thievesholm.

15. 13th March, 1860.—Letter from Mr. Aytoun, enclosing a document signed by every ship owner in Kirkwall (29 in number) recommending Thievesholm.

Consideration delayed.

Auskerry.

1. 7th February, 1848.—Letter from Admiralty, with enclosure from Lieutenant Thomson, R.N., recommending *inter alia*, a light on island of Auskerry.

2. 10th February, 1848.—Engineer reports that the application seems to have reference rather to the local wants of Orkney than to the necessities of general navigation.

3. 26th June, 1848.—Letter from Trinity House, concurring with Lieutenant Thomson, that a light on Auskerry would be useful as a coast light.

Nothing further done.

North Ronaldshay.

1. 16th March, 1848.—Letter to Trinity House, stating the Commissioners resolution of erecting a lighthouse here, instead of renovating Start Point light, and increasing its range.

2. 17th April, 1848.—Letter from Trinity House, conveying their sanction.

3. 11th January, 1851.—Resolved to build the lighthouse in course of ensuing year.

Erected and light exhibited 1854.

Bressay or Kirkabisterness.

1. 16th November, 1853.—Commissioners resolve to erect a lighthouse at the south entrance to Lerwick.

2. 1st December, 1853.—Letter to Trinity House for sanction.

3. 11th January, 1854.—Reply from Trinity House, stating that light on Bressay would be useful, but should be considered strictly local; however, in the spring they intend making a personal examination of the locality, with a view of obtaining the best site.

4. 2d August, 1854.—Letter from Trinity House, stating that they have visited the locality, and are of opinion that the outermost point of Kirkabisterness is the best site.

5. 10th November, 1854.—Report by engineers, stating that having made a survey, they find that Kirkabisterness commands so great a range of illumination, that it is preferable to the site suggested nearer Lerwick.

6. 27th December, 1855.—Letter to Board of Trade, transmitting plans of proposed lighthouse.

7. 12th January, 1856.—Reply from Board of Trade approving of ditto.

Erected and light exhibited 1858.

Whalsey.

1. 19th November, 1851.—Board resolve to erect a lighthouse.

2. 19th November, 1851.—Letter to Trinity House, wishing their sanction.

3. 27th November, 1851.—Reply from Trinity House, conveying sanction.

4. 5th October, 1853.—Offer of Mr. Kinghorn to build lighthouse for 6294*l.* 9*s.* 3*d.*, accepted.

5. 9th January, 1854.—Letter from Board of Trade, declining to sanction estimate for lighthouse.

6. 11th January, 1854.—Letter to Mr. Kinghorn, requesting him to suspend any preparations for the completion of his construct.

7. 24th February, 1854.—Letter from Mr. Kinghorn, requesting to be informed whether the Commissioners intend to proceed with the execution of the contract.

8. 25th February, 1854.—Letter from Commissioners to Board of Trade, transmitting copy of Mr. Kinghorn's letter.

9. 3d March, 1854.—Reply from Board of Trade approving of Commissioners proceeding with the lighthouse.

10. 7th March, 1854.—Letter to Mr. Kinghorn, authorizing him to proceed with the works.

11. 14th March, 1854.—Letter from Board of Trade, enclosing one from Admiralty, as to expediency of immediately erecting two lighthouses in Shetland.

The remainder of the correspondence on this subject has already been communicated to the Royal Commissioners.

North Unst.

1. Reference in engineer's annual report for 1850, stating the great expense which would attend the erection of a lighthouse here. A light would be of no great importance.

2. Engineer states (annual report for 1851) that the necessity for a light cannot be considered as urgent.

3. 11th March, 1854.—Letter from Board of Trade, enclosing one from Admiralty, as to expediency of immediately erecting two temporary lights in Shetland.

4. 23d March, 1854.—Letter from Board of Trade, requesting urgent steps to be taken for the erection of the lighthouse.

5. 3d April, 1854.—Letter to Board of Trade, stating that the Commissioners would make all the necessary arrangement for the erection.

The remainder of the correspondence on this subject has already been communicated to the Royal Commissioners.

Sule Skerry.

(30 miles north of Cape Wrath.)

1. 27th February, 1852.—Application from Mr. Sinclair Thurso, for light or beacon on this dangerous rock.

2. 3d March, 1852.—Letter to Mr. Sinclair stating that Commissioners cannot hold out any prospect of a lighthouse being erected; the expense would be great, the efficiency doubtful.

3. 15th October, 1852.—Letter to Mr. Sinclair, stating that the Commissioners had visited the Sule Skerry, and that although the expense of erecting a beacon would not be great, still the locality was not suitable for the erection of one, and that the height of rock itself served as a conspicuous mark.

4. 10th December, 1852.—Letter from Mr. Sinclair, hoping the Commissioners may further consider the subject.

5. Engineer reports (annual report 1853) against the establishment of a light, owing to expense, other engagements, &c.

Butt of Lewis.

1. 16th August, 1854.—Letter from Board of Trade, directing attention to the Butt of the Lewis, as an eligible site for a lighthouse, the erection of which the Commissioners last year considered as desirable for the safe navigation of the west coast of Scotland.

2. 15th November, 1854.—Engineer submits plans showing proposed site for a lighthouse.

3. 24th December, 1856.—Letter to the Board of Trade, stating that as the lighthouses, approved of in 1853, were nearly completed, Butt of Lewis and others might be constructed.

4. 14th January, 1857.—Answer from Board of Trade, stating that they do not find any definite plans for this lighthouse has been sanctioned by the Trinity House.

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5. 20th May, 1857.—Letter to Trinity House, desiring sanction.
6. 12th June, 1857.—Reply from Trinity House, enclosing a letter they had written to the Board of Trade, communicating their views on this as well other proposals.
7. 20th January, 1859.—Letter from Board of Trade, stating that lighthouse on Butt of Lewis should be proceeded with as soon as possible, and requesting plans.
8. 14th April, 1859.—Letter to Board of Trade, transmitting plans of lighthouse.
9. 2d June, 1859.—Letter to Board of Trade, transmitting tenders and recommending offer of Messrs. Barr to be accepted.
10. 4th June, 1859.—Reply from Board of Trade, approving of Messrs. Barr's offer.

Lighthouse in course of erection.

Stornoway.

1. 29th March, 1848.—Letter from engineer, enclosing one from Admiral Beaufort, and report by Captain Otter, in favour of light at Stornoway.
2. 29th March, 1848.—Letter to Admiralty, stating that proposal for a light has been remitted to a sub-committee.
3. 20th November, 1850.—Commissioners resolved to erect a lighthouse.

Erected and lighted January 1853.

Hebrides. Haskier. Monach.

1. 18th January, 1859.—Letter from Board of Trade, with enclosure from Captain Otter, as to necessity for a light.
2. 27th January, 1859.—Letter to Board of Trade, saying that a deputation of the Commissioners would visit the locality, and report.
3. 8th February, 1859.—Answer from Board of Trade, proposing a joint inspection of Elder Brethren and Commissioners.

A committee of the Commissioners met the Elder Brethren and Captain Otter, and thought that a lighthouse might be advantageous to guide coasting vessels clear of the dangerous rocks and shoals of that part of the coast.

4. 6th October, 1859.—Letter to Board of Trade, desiring their sanction to survey being made.
5. 19th October, 1859.—Letter from Trinity House, stating their opinion that a light on the Monach group of islands would be beneficial.
6. 9th November, 1859.—Letter from Board of Trade, stating that they quite agree with the Trinity House, as to placing a light on west of Monach group, but do not consider further survey necessary.
7. 7th December, 1859.—Report by Engineer, saying a further survey is necessary.
8. 4th January, 1860.—Letter from Trinity House, approving of a lighthouse being built on the Monach.
9. 11th January, 1860.—Ditto, from Board of Trade ditto.
10. 30th January, 1860.—Commissioners remit to Messrs. Stevenson to prepare plans, &c., of lighthouse.

Ushenish.

1. 3d August, 1854.—Communication from Trinity House, as to desirability of a lighthouse at Ushenish.
2. 10th November, 1854.—Report by engineer, with plans of lighthouse.
3. 14th November, 1854.—Letter from Board of Trade, approving of lighthouse being erected.

Erected and lighted November 1857.

Stourhead.

1. 24th December, 1856.—Letter to Board of Trade, stating that as lighthouses approved of in 1853 were nearly completed, Stourhead and others might be constructed.
2. 20th May, 1857.—Letter to Trinity House, requesting sanction.
3. 12th June, 1857.—Reply from Trinity House, enclosing a letter they had written to Board of Trade, giving preference to a projecting lump called "South Ear," as a site for the lighthouse.
4. 20th January, 1859.—Letter from Board of Trade, stating that lighthouse on Stourhead should

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- be proceeded with as soon as possible, and requesting plans.
5. 3d June, 1859.—Letter to Board of Trade, transmitting plans and estimate of lighthouse.
 6. 13th July, 1859.—Reply from Board of Trade, stating that my Lords are not prepared to sanction so high an estimate, and that the execution of the work must be postponed.
 7. 15th July, 1859.—Answer from Commissioners, explaining why estimate is so high.
 8. 19th July, 1859.—Reply from Board of Trade, wishing further explanation.
 9. 4th August, 1859.—Answer from Commissioners, giving ditto.

Rhu Rhea.

1. 1st December, 1853.—Letter to Trinity House, for sanction to erect lighthouse on Rhu Rhea.
2. 11th January, 1854.—Reply from Trinity House, stating that they intend visiting locality in the spring.
3. 2d August, 1854.—Letter from Trinity House, stating that having visited the locality, they think that a general passing light should be erected on Rhu Rhea, and a local light on Rona.
4. 11th August, 1854.—Letter to Board of Trade, stating that Commissioners had received a report from the Trinity House, and that they would now proceed to survey.
5. 10th November, 1854.—Engineer submits his report of survey.
6. 14th November, 1854.—Letter from Board of Trade, approving of erection of lighthouse on Rona.
7. 24th December, 1856.—Letter to Board of Trade, stating that as lighthouses sanctioned in 1853 were nearly completed, Rhu Rhea, along with others, might be constructed.

Rona.

1 to 6, same as Rhu Rhea.
Erected and light exhibited, 1857.

Kyleakin.

See also Parliamentary report on lighthouses, 1845, appendix No. 2, p. 577 (Castle Moil, Sound of Skye), remitted to engineer.

1. 4th December, 1844.—Application from Hugh McAskill, Esq., urging necessity for a lighthouse.
2. 23d December, 1845.—Engineer reports that a lighthouse is needed, and suggests the best site.
3. 21st October, 1846.—Commissioners resolve to erect a lighthouse as soon as the other engagements of the board will admit.
4. 27th October, 1846.—Letter to Trinity House, intimating resolution of Commissioners.
5. 5th November, 1846.—Answer from Trinity House, stating that the subject would receive attention pending further communication.
6. 19th November 1846.—Letter to Trinity House in terms of statute.
7. 7th December, 1846.—Letter from Trinity House, that they would visit the station.
8. 10th September, 1847.—Letter from Trinity House, approving.

Erected and light exhibited 1857.

Isle Oronsay.

1 to 6, same as Rhu Rhea.
Erected and lighted November 1857.

Ardnamurchan.

See Parliamentary report on lighthouses, 1845, appendix No. 22, p. 556. Resolved on, and trade to be consulted.

1. 24th January, 1845.—Circular to trade.
2. Answer from various bodies, favourable.
3. 28th February, 1845.—Committee resolve to erect a lighthouse.
4. 19th March, 1845.—General meeting approve, and remit to the committee to proceed.
5. 27th March, 1845.—Letter to the Trinity House, intimating resolution.
6. 8th May, 1845.—Answer, that Elder Brethren will visit the locality.
7. 22d October, 1845.—Letter from Elder Brethren, approving.

Erected and light exhibited, 1849.

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LIGHTHOUSES—GENERAL RETURN.

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Sound of Mull.

- 1 to 5, same as Rhu Rhea.
6. 14th November, 1854.—Letter from Board of Trade, approving of erection of lighthouse. Erected and light exhibited 1857.

Corran.

1. 27th December, 1845.—Letter from Admiralty, wishing to know if the Commissioners have any intention of erecting a lighthouse on Corran.
2. 31st December, 1845.—Report by engineer, that a light would prove useful.
3. 11th June, 1846.—Letter from Engineer, recommending the establishment of this light as a harbour light under canal commissioners.
4. 21st September, 1847.—Letter from Captain Robinson, R.N., stating necessity for a light, and conversation with Prince Albert on the subject.
5. 23d September, 1847.—Answer referring to canal commissioners.
6. Correspondence with Captain Robinson, principally as to buoying Linne Loch, also stating that a light at Corran is of too local a description to be undertaken by Commissioners, and that at any rate its execution must rank in importance after many other stations.

7. 22d January, 1848.—Letter from Secretary of Caledonian Canal, stating that he does not find any disposition on part of officers of treasury to recommend the canal commissioners to undertake the erection and maintenance of a light on Corran, and trusting that Commissioners of Northern Lighthouses will attach some weight to the claims of Corran Point for a lighthouse.

8. 25th January, 1848.—Report by engineer or to local character of light, and that the same urgent wants of the mariner must be attended to in preference.

9. 2d February, 1848.—Letter to Caledonian canal commissioners in terms of report.

10. 24th May, 1848.—Report by secretary as to his proceedings while in London, endeavouring to get clauses introduced into the Caledonian Canal Commissioners Bill before Parliament, to empower them to exhibit and erect lights. (Not complied with.)

11. 2d December, 1852.—Letter from engineer, Caledonian Canal, and enclosure from a ship master as to necessity of having a light on Corran Point. Secretary to report on previous proceedings and correspondence.

12. 29th December, 1852.—Report by secretary. Matter to rest until engineer reports on application for a light on Colonsay.

13. 14th January, 1857.—Letter from Board of Trade regarding the erection of various lighthouses in Scotland, and wishing Commissioners to consider as to exhibition of a small light at Corran Ferry.

14. 29th January, 1857.—Answer by Commissioners stating previous proceedings with regard to this lighthouse, and the inexpediency of erecting it.

15. 11th June, 1857.—Letter from Trinity House to Board of Trade, stating that committee had availed themselves of the opportunity of inspecting Corran Point, and found it a very eligible site for a small lighthouse, and recommending the early establishment of one there.

16. 24th June, 1857.—Letter from Board of Trade transmitting copy of letter from Trinity House, and sanctioning lighthouse.

In course of erection.

Lady Rock, Lismore.

7th March, 1860.—Recommendation from Capt. Bedford for a reflected light from Lismore to mark the beacon on this rock. Remitted to Messrs. Stevenson to report.

Phladda.

1. 7th March, 1857.—Captain Bedford having suggested propriety of placing a light on Phladda Island off Luing, report by Messrs. Stevenson stating that they took an opportunity of examining it, and think a lighthouse would be of great utility, and would, in connection with Ruadsgeir and Skervuile, complete the lightings of the sound of Jura.

2. 20th May, 1857.—Commissioners submitted to Trinity House, in terms of Act, for their sanction to build lighthouse.

3. 11th June, 1857.—Letter from Trinity House to Board of Trade, stating that committee had availed themselves of the opportunity of inspecting Phladda Island, and think the best position would be on a rocky ledge on the S.E. point.

4. 24th June, 1857.—Letter from Board of Trade transmitting copy letter from Trinity House, and sanctioning lighthouse.

In course of erection.

Portascaig.

1. 1st December, 1853.—Letter to Trinity House for sanction to erect lighthouse at Portascaig.

2. 11th January, 1854.—Reply from Trinity House stating that a light at Portascaig would only be useful to vessels passing through that Sound, and should, therefore, be considered as a local light, but that they intend visiting locality in the spring.

3. 2d August, 1854.—Letter from Trinity House, stating, that having visited the locality they do not approve of this position, and that Rhu Vaal Head would be the best.

Ruadsgeir.

1. 20th May, 1857.—Commissioners submitted to Trinity House in terms of Act, for their sanction to erect a lighthouse on Ruadsgeir.

2. 11th June, 1857.—Letter from Trinity House to Board of Trade, stating, that having visited the locality, they think that though an eligible site for a lighthouse, they consider it less urgently required than Skervuile or Phladda.

3. 24th June, 1857.—Letter from Board of Trade transmitting copy of letter from Trinity House as to this.

Colonsay.

1. 27th November, 1852.—Letter from Mr. May, Caledonian Canal, enclosing one from Captain Taylor, regarding importance of a light on north end of Colonsay.

2. 11th January, 1853.—Engineer reports that it will be necessary for him to visit the locality.

Rhu Vaal lighthouse, Sound of Islay, has been built instead of one on Colonsay.

Rhu Vaal.

Separate return transmitted on 13th June, 1859.

Skervuile, or Iron Rock.

Copy correspondence sent on 9th August, 1859.

Lachindaal.

See also parliamentary report on lighthouses 1845, appendix No. 22, p. 555. Refused.

1. 9th July, 1846.—Memorial from chairman and directors of association of under writers, Glasgow, as to necessity for a light to open up the harbour of refuge.

2. 25th August, 1846.—Memorial from president and members of the Liverpool Underwriters Association, as to necessity for a light to open up the harbour of refuge.

3. 25th August, 1846.—Letter from General Shipowners Society, regarding memorial from underwriters, Glasgow, hoping it may meet with favourable consideration.

4. 20th October, 1846.—Report by engineer on various applications, and recommending Dune Point as the best site for a lighthouse.

5. 26th October, 1846.—Letter to Trinity House transmitting copy of engineer's report, and stating intention of Commissioners to recommend erection of a lighthouse at first general meeting.

6. 5th November, 1846.—Answer from Trinity House saying that the matter will receive attention, pending further communications on the same subject.

7. 23rd October, 1846.—Letter to Secretary Underwriters' Association, Glasgow, stating Commissioners intention of erecting a lighthouse on Dune Point, so soon as their other engagements will permit.

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8. 23d October, 1846.—Letter to president of underwriters, Liverpool, in same terms.

9. 26th October, 1846.—Letter to Trinity House respecting sanction.

10. 7th December, 1846.—Answer from Elder Brethren, that they intend visiting the site.

11. 13th January, 1847.—Letter from Lloyd's agent in Islay, approving of the Commissioners' intention to erect a lighthouse, and enclosing a letter from shipowners regarding site.

12. Answer to Lloyd's agent stating that the subject of erecting a lighthouse is under consideration, but no prospect of the work being undertaken during the ensuing spring.

13. 16th September, 1847.—Letter from Trinity House conveying approval.

14. 16th April, 1848.—Letter from Lloyd's agent, regarding a wreck, and the necessity of a lighthouse being proceeded with.

15. 8th March, 1850.—Letter from Lloyd's agent urging necessity for erecting a lighthouse without delay.

16. 22d March, 1850.—Answer to Lloyd's agent, stating that this is not lost sight of, but delayed for want of funds.

17. 5th February, 1851.—Letter from Lloyd's agent regarding a wreck, and necessity for a lighthouse.

18. 12th February, 1851.—Answer referring to previous letter of 22d March, 1850, subject not overlooked, to be taken up as soon as funds and engagements of the Board will admit.

19. 6th March, 1858.—Letter from J. Dickson, Esq., enclosing letter from C. McLean, Esq., urging necessity for a lighthouse, and mentioning wrecks which had occurred.

20. 12th March, 1858.—Letter from Lloyd's agent, urging necessity for a lighthouse, and mentioning wrecks.

21. 18th March, 1858.—Letter to Mr. J. McLean stating that the intention of erecting a lighthouse has for some years been abandoned, as it is inexpedient to invite vessels of large tonnage to this anchorage, and calling attention to the erection of a lighthouse in the Sound of Islay.

Not erected.

Mac Arthur's Head.

1. 14th January, 1857.—Letter from Board of Trade, regarding erection of a lighthouse at Mac Arthur's Head.

2. 29th January, 1857.—Answer stating that Commissioners will give subject of light their attentive consideration.

3. 11th June, 1857.—Letter from Trinity House to Board of Trade, recommending Mac Arthur's Head as a suitable place for a lighthouse.

4. 24th June, 1857.—Letter from Board of Trade, transmitting copy of letter from Trinity House, and sanctioning lighthouse.

In course of erection.

Sanda.

See also parliamentary report on lighthouses, 1845, appendix No. 22, p. 556. Refused.

1. 18th February, 1846.—Letter from Ballast Board, Dublin, as to removing Kintyre lighthouse to Sanda, while they erect a lighthouse on Rathlin Island.

2. 7th May, 1846.—Letter from harbour master, Greenock, as to necessity for a light on Sanda.

3. 22d May, 1846.—Further letter from harbour master, Greenock, mentioning wrecks which had occurred on Patterson's Rock, a short distance from Sanda.

4. 13th October, 1846.—Report by engineer against removal of Kintyre light, and recommending Ship Rock of Sanda as a site for a lighthouse.

5. 24th October, 1846.—Letter to Ballast Board, stating inexpediency of removing light at Kintyre, and conveying Commissioners' resolution of erecting alighthouse on Ship Rock of Sanda.

6. 24th October, 1846.—Letter to harbour master, Greenock, conveying resolution of Commissioners to erect a lighthouse on Sanda.

7. 19th November, 1846.—Letter to Trinity House in terms of statute for sanction.

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8. 7th December, 1846.—Reply from Trinity House, approving.
Erected and light exhibited, 1850.

Devaar.

See also Parliamentary Report on Lighthouses, 1845, appendix No. 22, p. 555. Reserved.

1. 13th October, 1846.—Report by engineer that a light on Devaar would complete the chain of lights leading from the ocean to a safe refuge in Campbeltown harbour.

2. 5th November, 1846.—Letter to Trinity House, recommending that a light be placed on Devaar.

3. 6th November, 1846.—Letter to magistrates of Campbeltown, stating the intention of Commissioners to build a lighthouse on Devaar.

4. 7th December, 1846.—Approval of Trinity House.

Erected and light exhibited 1854.

Girvan.

1. June, 1850.—Petition from magistrates of Girvan, for a light on coast of Carrick in the Bay of Girvan, to serve both as a harbour and coast light.

2. June, 1850.—Engineer reports that a light is unnecessary on this part of the coast.

3. 11th July, 1850.—Letter to town clerk, stating that Commissioners do not consider a light necessary in the locality, and that they have no power to erect harbour lights.

Cairn Ryan.

See also parliamentary report on lighthouses, 1845, Appendix No. 22, p. 557. Reserved.

1. 6th June, 1845.—Letter from Captain Edmondston, suggesting the importance of a light at the entrance to Loch Ryan.

2. 10th June, 1845.—Report by engineer, on above letter agreeing as to usefulness of light.

3. 7th July, 1845.—Meeting resolve to recommend to ensuing general meeting that beacon on Cairn Ryan should be converted into a lighthouse.

4. 8th July, 1845.—General meeting direct statutory notice of alteration to be made to Trinity House.

5. 8th July, 1845.—Letter to Trinity House conveying statutory information.

6. 17th July 1845.—Answer from Trinity House, stating that Elder Brethren will visit the station.

7. 22nd October, 1845.—Letter from Trinity House, approving.

Erected and light exhibited, 1847.

Heston (Solway).

1. 22d March, 1847.—Letter from Admiralty, suggesting light on Heston Island.

2. 30th March, 1847.—Report by engineer, stating that the call for a light cannot be viewed as pressing.

3. 1st January, 1848.—Letter from Solicitor General, enclosing five petitions from ship owners, &c. interested in safety of Solway navigation.

4. 10th January, 1848.—Answer, stating that the call for a light is not so urgent as to induce the Board to erect one at present.

5. Correspondence in winter of 1848-9, as to article in "Dumfries and Galloway Courier," and letter from Mr. Sandford, sheriff of Kirkcubright, enclosing memorial, urging importance of a small coasting light, owing to increased traffic in the Solway.

6. 29th May, 1849.—Report by engineer, stating that it is inexpedient to erect a light on Heston Island.

7. 4th June, 1849.—Letter to memorialists in terms of engineer's report.

8. 3d November, 1849.—Answer from Mr. Maxwell, disagreeing with Commissioners views in regard to this.

9. 24th January, 1849.—Letter to Captain Robinson, R.N., stating that Commissioners had come to no conclusion as to erecting a light on Heston.

Nothing further done.

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Southernness (Solway).

1. 4th March, 1859.—Proposal from River Nith Commissioners for the surrender of this light to the Northern Lighthouse Board.

2. 10th March, 1859.—Letter to Nith Commissioners as to range of light.

3. 20th May, 1859.—Reply by Nith Commissioners, giving range.

4. 26th May, 1859.—Letter to Nith Commissioners regarding difficulties in way of surrender.

The Commissioners on their tour of inspection visited this station on the 22d July, 1859, and were unanimously of opinion that the proposed transfer should be rejected.

1. On account of the very inefficient state of the premises; and
2. Because it was very much to be doubted whether this was the best site for the light house.

Bahama Bank Floating Light.

1. 28th November, 1846.—Letter from Glasgow and Liverpool Steam Company, stating that they mean to memorialize Commissioners of Northern Lighthouses for floating light, and wishing to know if same comes within the province of the Board.

2. 2d December, 1846.—Answer stating that Commissioners had no powers.

Douglas Head.

1. 21st May, 1857.—Letter from Harbour Commissioners, Isle of Man, wishing the Northern Light Commissioners to free them from maintenance of light.

2. 18th June, 1857.—Letter to Harbour Commissioners wishing information as to description of tower, lighting apparatus, &c.

3. 24th June, 1857.—Letter from Harbour Commissioners, that no dues are levied by them.

4. 26th June, 1857.—Answer, stating that if Commissioners assume the light, they must be empowered to levy dues.

5. 6th July, 1857.—Letter from Harbour Commissioners, conveying information as to height of tower, &c.

6. 20th July, 1857.—Commissioners of Northern Lighthouses, on their tour of inspection visited the station, and agreed to apply for the sanction of Board of Trade to the proposed surrender.

7. 6th October, 1857.—Letter to Board of Trade in conformity.

8. 24th October, 1857.—Reply stating difficulties in way.

9. 21st December, 1858.—Letter from Harbour Commissioners, saying they are prepared to waive difficulties, and consent to a transfer.

10. 31st December, 1858.—Letter from Board of Trade, desiring an estimate of cost of transfer, maintenance, &c.

11. 2d June, 1859.—Answer by Commissioners conveying estimate.

12th. 7th June, 1859.—Reply by Board of Trade, approving of transfer.

This light was taken in charge by the Commissioners, and lighted by them on 1st August, 1859.

Langness, Isle of Man.

1. 1st April, 1846.—Memorial from merchants, ship owners, &c. of the Isle of Man as to necessity for a light.

2. 2d April, 1846.—Answer, stating that Commissioners cannot erect any more lighthouses in Isle of Man, for want of powers.

3. 27th August, 1859.—Memorial from John McMeiken, agent for Shipwrecked Fisherman's Society, &c., as to importance of light and fog-bell attached, mentioning wrecks which had occurred, and enclosing extract from Captain Washington report, urging the great necessity for a light.

4. 8th December, 1859.—Report by Messrs. Stevenson on above memorial, stating that a light here would be useful, and suggesting a survey.

5. 15th December, 1859.—Letter to Board of Trade, for authority to make survey.

6. 19th December, 1859.—Reply, stating that as at present advised, they see no necessity for another light in the Isle of Man, but that Commissioners may apply through Trinity House.

7. 5th January, 1860.—Letter to Trinity House, desiring their opinion as to the erection of a light-house.

8. 11th January, 1860.—Reply from Trinity House, stating that they see no sufficient cause for an additional light in the locality.

9. 16th January, 1860.—Letter to J. McMeiken, Esq., stating that Government had decided against it.

LIST of sites for lighthouses, submitted to President of Board of Trade, 1853.

- St. Abb's Head.
- Inch Colm.
- Carline Nose.
- Fifeness.
- Ratray Briggs.
- Sarcellet Head.
- Switha, Orkney.
- Copinsha, Orkney.
- Tankerness, or Mouldhead.
- Thievesholm.
- Greenholm.
- Fair Isle.
- Bressa Sound, south entrance to.
- Balta Sound.
- Lambaness, Unst.
- Riga; middle of Yell Sound.
- Hillswick, Shetland.
- Ve Skerries.
- Bressa Sound, north entrance to.
- Island of Noss.
- Scallawy.
- Nouphead.
- Sule Skerry.
- Holbornhead.
- Grave Point.
- Rona.
- Butt of Lewis.
- Stourhead.
- Loch Inver.
- Rona Island, Skye.
- Flannan Isles.
- St. Kilda.
- Dunvegan Head.
- Hysker Minsh.
- Kyleakin.
- Point of Slate.
- Tobermory, near entrance to.
- Loch Scriden, Mull.
- Iona.
- Corran Ferry.
- Island, near Crinan.
- Sound of Isla.
- Armadon Point.
- Lamlash.
- Heston Island, Kirkcudbright.

XV. The total income and expenditure of the Commissioners of Northern Lighthouses on maintenance of light-houses in each year since 1845 to 1858, both inclusive.

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Year.	Total Income.		Ordinary Maintenance.		Expenditure on New Works.		Total Expenditure.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.
1845	53,395	3 1	27,309	4 14/8	23,327	8 74/8	31,036	12 9
1846	47,895	8 86/8	32,033	6 3	29,311	9 92/8	60,374	13 92/8
1847	42,021	1 31/8	31,447	11 36/8	32,989	17 22/8	64,437	8 6
1848	40,511	13 11	34,714	16 41/8	35,114	12 94/8	60,226	9 2
1849	44,984	4 3	37,433	6 6	17,538	14 9	53,322	11 3
1850	48,394	1 6	35,051	5 7	12,485	17 3	48,437	2 10
1851	51,912	13 01/8	33,250	16 31/8	3,935	19 4	37,185	15 74/8
1852	50,600	1 42/8	31,855	13 72/8	10,536	8 9	42,432	8 42/8
1853	53,840	14 86/8	27,769	13 26/8	14,034	19 2	41,774	12 85/8
1854	29,124	7 7	28,571	11 5	28,287	0 11	56,828	12 4
1855	26,380	1 4	30,233	13 1	12,124	11 1	42,288	4 2
1856	32,780	2 7	28,877	2 4	32,254	3 9	61,131	6 1
1857	29,867	13 3	30,487	14 4	31,716	1 9	62,203	16 1
1858	26,337	15 5	30,621	7 2	29,125	8 1	59,746	15 3

a During the year 1846, two reductions of light duties came into operation. The first was one halfpenny per ton for the Bell Rock Light; one farthing per ton for each of the lights of Corsewall and Mull of Galloway, and one eighth of a penny for Pladda Light. This reduction was in operation during the first half of 1846.

The second reduction, which was in force during the last six months of 1846, gave, including the previous one, an aggregate abatement to coasting trade of 50 per cent. for each light.

b, c, d, e, see next page.

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- XVI. If the proposal be considered deserving of attention it is remitted to Messrs. Stevenson to make experiments in a temporary lightroom provided for this purpose at Inch Keith, and they report the result. The Board previously had temporary cabins at Gulaneness, where extensive comparative trials were conducted by them.
- XVII. DATES of all applications for power to construct or reconstruct or alter lighthouses, since October 1853, with date of final approval, and in case of non-compliance, the reason given for any deviation.
1. 16th November, 1853.—Commissioners resolved to erect the following lighthouses:—
 1. One at or near Portaskaig, in the Sound of Islay.
 2. One at or near Tobermory, in the Sound of Mull.
 3. One at the south entrance to the Sound of Skye.
 4. One on the Island of Rona, north entrance to the Sound of Skye, in addition to the light already resolved upon at Kyleakin.
 5. One on the coast of Sutherland, at or near Stourhead or Rhu Rhea.
 6. One at Little Holbornhead, near Thurso.
 7. One on Cantickhead or Switha, in Orkney, and
 8. One on Bressay, at the south entrance to Lerwick.
 2. 1st December, 1853.—Letter to Trinity House for sanction.

A copy of the above letter sent to the Board of Trade same day.

 3. 11th January, 1854.—Letter from Trinity House, stating that they had come to the following conclusions with respect to the eight proposed lights:—
 1. That a light at Portaskaig would only be useful to vessels passing through that sound, and should, therefore, be considered as a local light.
 2. That a light near Tobermory would be useful to indicate the northern entrance to that sound, and should be considered as a local light.
 3. That a small light at the southern portion of the sound of Skye, would also be useful as a local light.
 - 4, 5. The Elder Brethren thought that though a small light on Rona might be found useful to open up the Sound of Applecross, the necessity of its erection would become unquestionable, if the first class light proposed for Stourhead or Rhu Rhea Head were placed on the latter headland.
 6. A small light for Thurso Bay would be found useful, but should be deemed strictly local and chargeable as such.
 7. That a light on Cantickhead or Switha, would be beneficial to vessels passing through the Pentland Frith, as indicating the entrance to the anchorage of Longhope, and might with propriety be charged as a general local light; and
 8. That the light on Bressay would be useful, but should be considered strictly local.

And that, in the event of the intended erection, any portion of them meeting the sanction and concurrence of the Board of Trade, they will in the spring make a personal examination of the several localities with the view of forming a definite opinion as to the most eligible site.
- b* In the year 1854 the light duties were reduced from one farthing per ton for coasting vessels, to the sixteenth of a penny, less ten per cent.; and an abatement of 25 per cent. was granted from the duties paid by the overseas shipping.
- The total expenditure since 1854 has been defrayed from the Mercantile Marine Fund, the income having since then been paid to that fund.
- c* Up to 30th June 1856, the income included light duties collected at all the ports in the United Kingdom, payable for Northern Lighthouses only. Subsequent to that date, the income stated consists of duties received for all British and Irish lights collected at ports in Scotland and the Isle of Man, for each of the three Boards.
- d* In April 1857, the abatement allowed from the duties was increased to 25 per cent. for coasting, and 40 per cent. for overseas shipping.
- In the preceding return, under the head ordinary maintenance, is given the whole expenditure (including shipping, salaries, superannuations, and all other outlays) incurred for the lighthouses. The sums annually expended for new works are given separately.
- e* In 1852 the Commissioners were placed under the control of the Board of Trade when various alterations, were by directions of the Board of Trade made in stating the mode of the accounts. These alterations changed the relative amounts of ordinary and extraordinary expenditure, as charging the Engineer's salary to extra expenditure which was previously stated against ordinary expenditure, &c. The commission of 5 per cent. on the receipts paid to collectors, was also cut off.
4. 26th January, 1854.—Letter to Board of Trade, sending copy of Trinity House's letter.
 5. 2d August, 1854.—Letter from Trinity House, stating that pursuant to their intention they had visited the coast of Scotland with the object of giving a definite reply as to the particular site which they might approve as most eligible for each of the new lighthouses, under sanction of the Board of Trade.
 - 1st. At or near Portaskaig, in Sound of Islay; does not approve of this position, but that Rhu Vaal Head would be the best.
 - 2d. That the outlying north-east point of Mull is the most suitable position.
 - 3d. Sound of Skye; that the lighthouse should be placed in the extreme point seaward of the Island of Gillian.
 - 4th. Rona; that this site is well chosen.
 - 5th. Stourhead in Sutherland or Rhu Rhea in Ross-shire. Stourhead presents a good elevation for a lighthouse should one be found necessary; but the coast between it and Cape Wrath is free from danger, the distance between them being only 26 miles. In considering the relative advantages of the Rhu Rhea and Rona as sites, they beg leave to observe, that for vessels coming up the Minsh, and stretching towards the coast for Cape Wrath, the site on Rhu Rhea would be most advantageous, whereas for vessels proceeding either north or south through the Eastern Channel that on Rona would be most beneficial. Were it not for the dangerous sunken rocks lying off the north end of Rona, a good light on Rhu Rhea would be sufficient; but the distance being 17 miles apart, a light on Rhu Rhea would not be sufficient in thick weather, when most wanted. Under these circumstances, the Elder Brethren are led to the conclusion, that if the trade of the channels is sufficient to justify the expense, a general passing light should be erected on Rhu Rhea, and a local light on Rona. In this case no lighthouse will be necessary on Stourhead, seeing that it is situate about midway between Cape Wrath and Rhu Rhea, and no dangers lying between them.
 - 6th. Thurso Bay and Scrabster Roads. There does not appear to be any difficulty steering towards this anchorage, which lies a little round the headland called "Holbornhead," which is bold and clear to seaward, and a vessel having got sight of Dunmethed at night, or of the head during day, would have no difficulty in finding her way to the anchorage in Scrabster Roads. At the same time a local harbour light would be useful, and might induce small craft to frequent this anchorage in contrary winds.
 - 7th. Cantickhead; preferred before Switha.
 - 8th. Bressay. The outermost point of Kirkabisterness is the best site—*Ushenish*.

The Elder Brethren have understood that a suggestion has been offered to erect a lighthouse in the vicinity of Huish Point, upon which, though not adverted to in your letter of 1st December, they beg to remark that Ushenish Head projects beyond Huish Point, consequently a light placed on that point would be of little use as a coasting light, although it might lead to the anchorage of Loch Skipport; and no doubt a light on that head would be very useful for the navigation of the coast to vessels bound either northward or southward.

The head is of moderate elevation, and suitable for a lighthouse.
 6. 8th August, 1854.—Report of engineer, on letter from Trinity House, as to new lighthouses; with two exceptions, the sites had been approved of, these were—
 - 1st. The Sound of Islay. The Trinity House objects to the proposed site, and after full consideration, I think the grounds on which their objections are based are well founded. They accordingly recommend a light on Rhu Vaal Head to open up the north entrance.

(Correspondence in full already sent.)

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2d. The second site, regarding which the Trinity House report adversely, is Bressay Sound. The point recommended by them is Kirkabisterness, whereas the spot I suggested is near Southness. The site which has the greatest range should have the preference, which can be found by taking bearings.

7. 11th August, 1854. — Letter to Board of Trade, stating that as the Commissioners had received a report from the Trinity House on the new lighthouses, they will now proceed with surveys of the different stations selected, in order that plans may be prepared and the ground purchased, as directed in my Lords letter of the 23rd May last.

8. 16th August, 1854. — Letter from Board of Trade, directing that attention to two other sites for lighthouses; the erection of which the Commissioners last year considered as desirable for the navigation of the west coast of Scotland; viz., the Butt of Lewis, and an intermediate station between Island Glass and Barra.

My Lords concurring that lighthouses should be erected at these places, requested the Elder Brethren, if opportunity occurred, to inspect these sites also; the Elder Brethren were able to examine only one station, viz., Ushenish, a cape midway between Barra and Island Glass; and my Lords think it would be desirable that the engineer should visit the Butt of Lewis, and Ushenish as well as the other station approved of by the Elder Brethren.

9. 18th October, 1854. — The engineer reported that the surveys of sites for new lighthouses were far advanced, and he had to bring under the notice of the Board the necessity of determining as soon as possible what works are to be undertaken next year, with a view to the preparation of the estimates and preliminary arrangements for organizing the works to be carried on.

10. 10th November, 1854. — Engineer submitted his report of the several surveys:—1st, Kirkabisterness; 2d, Butt of Lewis; 3d, Rona; 4th, Rhu Rhea; 5th, Kyleakin; 6th, Isle Oronsay; 7th, Rhu Ushenish; 8th, Rhuna Gall Tobermory; 9th, Rhu Vaal.

Sites not surveyed, Cantickhead, and Holbornhead.

11. 14th November, 1854. — Letter from Board of Trade, approving the erection of lighthouses on the sites recommended by the Trinity House in their report of (2d) August.

12. 14th March, 1854. — Letter from Board of Trade, transmitting one from Admiralty, as to the expediency of erecting two lighthouses on North Unst and Whalsey Skerries.

13. 23d March, 1854. — Letters from Board of Trade, requesting North Unst and Whalsey Skerries to be proceeded with as temporary lights.

14. 3d April, 1854. — Letter from Board of Trade, desiring that preparations for erecting the temporary lights upon Whalsey Skerries should be proceeded with, but that North Unst should be postponed, as considerable difficulty exists as to the selection of a site, and until the Trinity House makes a personal examination.

(Full correspondence already sent.)

15. 29th March, 1854. — Start Point. — Letter to Trinity House from Commissioners, intimating that so soon as North Ronaldshay Light shall be exhibited it will be necessary to alter the character of Start Point lighthouse from a revolving to a fixed light.

16. 5th April, 1854. — Letter from Trinity House, concurring in the application.

17. 6th April, 1854. — Letter to Board of Trade, requesting their approval to the change.

18. 11th April, 1854. — Letter from Board of Trade, sanctioning the change.

19. Skervuile, 31st October, 1856. — Letter to Board of Trade, intimating that applications had been made for a lighthouse on Skervuile.

20. 23rd July, 1857. — Answer from Board of Trade, that it will be better not to undertake more works for the present beyond those recently sanctioned.

21. 30th November, 1858. — Letter from Commissioners, transmitting estimates for lighthouses

for 1859, and suggesting that Skervuile or Iron Rock might be proceeded with.

22. 7th January, 1859. — Answer from Board of Trade, concurring with Commissioners, and requesting that plans, specifications, and estimates should be proceeded with.

23. 28th March, 1859. — Letter to Board of Trade, transmitting plans and specifications which Commissioners estimate at 9603*l.* 9*s.*

24. 11th April, 1859. — Letter from Board of Trade, intimating that they cannot sanction unless reduced to 6,000*l.*

(Full correspondence already sent.)

25. 24th December, 1856. — Letter to Board of Trade, stating that as the lighthouses which had been approved of by the Board of Trade from the list sent in 1853, were nearly completed, others might be constructed which had been under my Lords consideration. These were, 1st, Rhu Rhea; 2d, Butt of Lewis and Holbornhead.

26. 30th January, 1857. — Wrote to Trinity House for sanction, and received it, 5th February.

27. 29th January, 1857. — Wrote to Board of Trade for sanction, and received it 12th February, 1857.

28. 14th January, 1857. — Letter from Board of Trade, stating that it was not their wish to undertake or suggest the erection of lighthouses, which those who have more immediate knowledge do not consider necessary, but they would wish to have it considered whether a small light at the point of Corran Ferry, to aid the navigation of the Caledonian canal, and a light at the south entrance of the Sound of Islay (Mac Arthurs-head) are not needed.

29. 28th January, 1857. — Communication ordered to be opened by Commissioners with the Elder Brethren in regard to a light at the south entrance of the Sound of Islay.

30. 29th January, 1857. — Letter to Board of Trade, stating that they will give the subject of a light at the south entrance of the Sound of Islay their attentive consideration, and

31. (Same date.) — That the light at Corran has long been under the Commissioners consideration. It would unquestionably be of great utility to vessels navigating the Caledonian canal.

32. 7th May, 1857. — Report by Messrs. Stevenson, on proposed lighthouses on Hebrides, stating that Captain Bedford having suggested the propriety of placing a light on Bladda or Pladda Island, off Luin, they took an opportunity of examining it, and think that a light there would be of great utility, and would, in connection with Ruadsgier and Skervuile, complete the lightings of the Sound of Jura.

33. 20th May, 1857. — Commissioners submitted to Trinity House, in terms of Act, for their sanction, resolutions to build lighthouses on, 1st, Skervuile; 2nd, Ruadsgier; 3rd, Bladda or Pladda; 4th, Rhu Stour; 5th, Butt of Lewis.

34. Letter from Trinity House to Board of Trade, of 11th June, 1857, on the subject of the new lighthouses after having made a visit of inspection.

1. Skervuile (already sent.)

2. Ruadsgier. The Elder Brethren, although viewing it as an eligible site for a lighthouse, consider it less urgently required than Skervuile or Phladda.

3. Phladda or Bladda. — They consider this the most difficult portion of the sound for vessels navigating by night, and they consider that the best position would be on a rocky ledge on the south east point.

4. Stourhead. — The best site would be on the projecting lump called the "South Ear."

5. Butt of Lewis. — Had not an opportunity of visiting it, and referring to the Board of Trade's letter of 14th January last, they had an opportunity of visiting Corran, a small light of the 3rd order. Would be valuable for guiding vessels as they entered or left the Caledonian canal. And advertising to the preference which the Elder Brethren had considered should be given to the "Black Rock," at the Sound of Islay, having carefully examined this rock or rocks, it became evident

SCOTLAND.
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Question
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XVII.

that a lighthouse could not be constructed on the outermost of them, and they now therefore recommend McArthurhead, as being best for guiding vessels clear of the Black Rocks and Glass Island.

35. 18th December, 1857. — Sent plans of Corran, Phladda, and McArthurhead to Board of Trade for approval, and after some correspondence as to cost, &c. were at last, in March 1858, sanctioned.

36. 9th July, 1858. — Letter from Board of Trade, postpones the erecting of Holbornhead, owing to proprietor of the land not coming to Commissioners terms (full correspondence already sent.)

37. 31st December, 1857. — Commissioners wrote to Board of Trade, advertising to the loss of two steamers in the Firth of Forth, and they think that a light on Fifeness would be a sufficient guide for the Carr Rock, while with the lights on the Isle of May, it would indicate the entrance to the Firth of Forth, and be very useful for vessels running for shelter from the north in a gale of wind.

Also lighthouse would be very useful on St. Abbs Head, being the turning point of vessels entering the Firth from the southward.

38. 23d February, 1858. — Letter from Board of Trade, stating that the Elder Brethren will visit the locality for the purpose of determining on a site on the south side of the Forth.

39. 18th March, 1858. — Letter from Board of Trade, stating that after consultation of the Elder Brethren, it appeared to my Lords that the proposed light on Fifeness would not likely meet with *their* approval, but that one was wanted on

LIGHTHOUSES—GENERAL RETURN.

XVII., XVIII.

St. Abbs Head, and they would avail themselves of an early opportunity of visiting the locality.

40. 28th April, 1858. — Letter to Board of Trade, that a deputation of the Commissioners will wait on the deputation of the Trinity House, in order to investigate the call for additional lights, and if such be found necessary to consider the best site.

41. 19th May, 1858. — Letter to Trinity House, with reference to the correspondence about lights in Firth of Forth, and to the conference that passed between the deputation of the Elder Brethren and Commissioners, the Commissioners have resolved to erect a lighthouse on St. Abbs Head, on the spot fixed by the joint committee, and now ask for the statutory approval of the Elder Brethren. A copy of this letter has been transmitted to Board of Trade.

42. 26th May, 1858. — Letter from Trinity House, with copy of their letter to Board of Trade, communicating the concurrence of the joint committee on the proposed light at St. Abbs Head; and 2d June 1858, letter to Commissioners from Trinity House, enclosing the Board of Trade's approval, dated 31st May, 1858.

43. 20th January, 1859. — Butt of Lewis. Letter from Board of Trade, wishing the Commissioners to proceed with the proposed lights on Stourhead and Butt of Lewis.

XVIII. Copies furnished.

24th June 1859.

Submitted and prepared

By Order,
ALEX. CUNNINGHAM, Secy.

CIRCULAR No. III.—LIGHTHOUSES.—SPECIAL RETURNS.

The Arabic numbers at the answers correspond with those opposite to the questions in Circular III.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

83.

CALF OF MAN,
CALF ISLAND.

4. Two lights, 187 yards apart.
5. 1815. Act obtained in 1816.
6. Shipping of Liverpool and Clyde.
7. Two lights in one, lead upon the Chickens Rock.
8. 1818.
9. Robert Stevenson, engineer; Lorimer Edinburgh, contractor.
10. Sea lights.
11. Stone, of natural colour; solid walls.
12. Yes; copper rods.
13. Upper, 70 feet; lower, 55 feet.
14. Upper, 375 feet; lower, 282 feet.
15. About 21 and 18 nautic miles respectively.
16. About 27 and 24 nautic miles respectively.
17. From E.N.E. to S.E. by E., westward.
18. Revolving.
19. Every two minutes.
20. Going away of daylight to return.
21. Catoptric.
22. First order.
23. None.
24. Clark, and Swan and Neil, Edinburgh, and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 18 days.
29. See Point of Ayre.
30. Finished.
31. Dimensions of lanterns: diameter, 12 feet; height, 7 feet. For price, see Drawing, No. 15.*
32. No.
33. 15s. 11d.; days wages.
34. 3l.; done by the keepers.
35. 55l. principal; 40l. three assistants each. 5l. to each in lieu of land.
36. See Drawing, No. 2, General Return.
37. About 9l. annually.
38. 1,019 and 987 gallons. 18 gross of 1 size of wicks annually.
39. Colza. 1857, 4s. 1½d.; 1858, 3s. 4¼d.
40. Circular web, 1 size, at a cost of 3l. annually.
1. Nil.
2. Mercantile Marine Fund.
3. 1852, 601l. 19s. 10¾d.; 1858, 298l. 18s. 3d.; total 1852, 2,221l. 7s. 8¾d.
4. 1852, 569l. 5s. 7d.; 1858, 512l. 19s. 6d.
5. None.
6. None.
7. None.
8. None.
9. None.
0. Commissioners, secretary, and superintendent.
1. April, June, and August.
2. No.
3. One in each light room.
4. Rain gauge, barometer, and thermometer.
5. None.
6. None.
7. Occasionally.

84.

POINT OF AYRE,
ISLE OF MAN.

4. One light.
5. 1815; Act obtained in 1816.
6. Shipowners of Liverpool and Clyde.
7. Northern end of island.
8. 1818.
9. Robert Stevenson, engineer; Lorimer, Edinburgh, contractor.
10. Sea light.
11. Stone, of natural colour; solid walls.
12. Yes; copper rod.
13. 99 feet.
14. 106 feet.
15. About 11 nautic miles.
16. About 17 nautic miles.
17. S. by W. to W. by N., north-easterly.
18. Revolving, alternate red and white.
19. Every two minutes.
20. From going away of daylight to return.
21. Catoptric.
22. First order; 12 burners.
23. None.
24. Clark, and Swan and Neil, Edinburgh, and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 10 days.
29. 18s. 46l. 16s. 3d., including two lighthouses on Calf of Man.
30. Finished.
31. Dimensions of lantern: height, 7 feet; diameter, 12 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2l.; done by the keepers.
35. 50l. principal; 40l. assistant, with land.
36. See Drawing, No. 4, General Return.
37. About 8l. annually.
38. 519 and 528 gallons. 9 gross of 1 size of wick annually.
39. Colza. 1857, 4s. 1½d.; 1858, 3s. 4¼d.
40. Circular web, 1 size, at a cost of 30s. annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 541l. 16s. 6d.; 1858, 274l. 5s. 7d.; total 1852, 1,923l. 8s. 10½d.
44. 1852, 268l. 2s. 4d.; 1858, 281l. 16s. 7d.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
32. No.
53. One in the light room.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

85.

LITTLE ROSS, KIRK-
CUDBRIGHT.

4. One light.
5. 1821.
6. Shipowners of Kirkcudbright.
7. To open anchorage.
8. 1843.
9. Robert Stevenson, engineer; Robt. Ilume, Gatehouse, contractor.
10. Sea light.
11. Stone, of natural colour; double walls.
12. Yes; copper rod.
13. 65 feet.
14. 175 feet.
15. About 14 nautic miles.
16. About 20 miles nautic.
17. N. by E. to N.W. by W. southerly.
18. Flashing.
19. Every five seconds.
20. Going away of daylight to return.
21. Catadioptric, system of Fresnel.
22. 1st class.
23. None.
24. Cookson, Newcastle, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 18 days.
29. 8,478l. 15s. 7d.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 8s. 5d.; days wages.
34. 2l.; done by the keepers.
35. 50l. principal, 40l. assistant, with 10l. each in place of land.
36. See Drawing, No. 9, General Return.
37. About 8l. annually.
38. 722 and 673 gallons. ¾ gross of each of the 4 sizes annually.
39. Colza. 1857, 4s. 1½d.; 1858, 3s. 4¼d.
40. Circular web, 4 sizes, at a cost of 21s. annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 154l. 16s. 2½d.; 1858, 32l. 5s. 11d.; total 1852, 611l. 16s. 9½d.
44. 1852, 373l. 0s. 10d.; 1858, 328l. 1s. 10d.
45. None.
46. None.
47. None.
48. None.
49. Coast Guard report every half year.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in lightroom. Oil stored under the tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

* Note.—The numbers in the Special Returns given above refer to the number in a volume of Drawings furnished in answer to Query IX. of General Return.

86.

MULL OF GALLOWAY.

4. One light.
5. 1825.
6. Shipping of the Clyde and Liverpool.
7. A guide through the channel.
8. 1830.
9. Robert Stevenson, engineer; Brebner and Scott, Edinburgh, contractors.
10. Sea light.
11. Stone, of natural colour; double walls.
12. Yes; copper rod.
13. 86 feet.
14. 325 feet.
15. About 19 nautic miles.
16. About 26 nautic miles.
17. From N.E. to N.W. $\frac{1}{2}$ W. southerly.
18. Intermittent.
19. Visible $2\frac{1}{2}$ minutes, and eclipsed half a minute.
20. Going away of daylight to return.
21. Catoptric.
22. 1st order.
23. None.
24. Clark, Edinburgh, and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 19.
29. 8,378*l.* 9*s.* 9*d.*
30. Finished.
31. Dimensions of lantern: diameter, $1\frac{1}{2}$ feet; height, $5\frac{1}{2}$ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2*l.*; done by the keepers.
35. 50*l.* principal, 40*l.* assistant, with land.
36. See Drawing, No. 5, General Return.
37. About 8*l.* 10*s.* annually.
38. 627 and 641 gallons. 12 gross of one size of wicks annually.
39. Colza. 1857, 4*s.* $1\frac{1}{2}$ *d.*; 1858, 3*s.* $4\frac{1}{2}$ *d.*
40. Circular web, 1 size, at a cost of 2*l.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 829*l.* 6*s.* $7\frac{1}{2}$ *d.*; 1858, 280*l.* 19*s.* 4*d.*; total 1852, 2,988*l.* 0*s.* $3\frac{1}{2}$ *d.*
44. 1852, 345*l.* 15*s.* 3*d.*; 1858, 349*l.* 0*s.* 6*d.*
45. None.
46. None.
47. None.
48. None.
49. Coast Guard report every half year.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

87.

CORSEWALL,
WIGTOWNSHIRE.

4. One light.
5. 1814.
6. Shipping of the Clyde.
7. To light south entrance to the Clyde.
8. 1817.
9. Robert Stevenson, engineer; built under his orders, by days wages.
10. Sea light.
11. Stone, of natural colour; solid walls.
12. Yes; copper rod.
13. 110 feet.
14. 120 feet.
15. About 12 nautic miles.
16. About 18 nautic miles.
17. N.E. by E. to S.W., northerly.
18. Revolving, red and white alternately.
19. Every two minutes.
20. Going away of daylight to return.
21. Catoptric.
22. First order; 12 burners.
23. None.
24. Clark, the Greenside Company, and others.
25. Smoke tubes, air apertures.
26. None.
27. None.
28. 19 days.
29. 7,835*l.* 19*s.* 8*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 7 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 1*l.* 17*s.* 2*d.*; days wages.
34. 2*l.*; done by the keepers.
35. 50*l.* principal, 40*l.* assistant; with land.
36. See Drawing, No. 4, General Return.
37. About 8*l.* annually.
38. 500 and 517 gallons. 9 gross of 1 size wick annually.
39. Colza. 1857, 4*s.* $1\frac{1}{2}$ *d.*; 1858, 3*s.* $4\frac{1}{2}$ *d.*
40. Circular web, 1 size at a cost of 30*s.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 847*l.* 10*s.* $11\frac{1}{2}$ *d.*; 1858, 329*l.* 2*s.* 2*d.*; total 1852, 3,189*l.* 4*s.* $6\frac{1}{2}$ *d.*
44. 1852, 276*l.* 3*s.* 9*d.*; 1858, 291*l.* 2*s.* 5*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard reports every half-year.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

88.

LOCH RYAN,
WIGTOWNSHIRE.

4. One light.
5. Beacon first proposed in 1841, but converted into a lighthouse in 1847.
6. Shipowners of Glasgow.
7. To open the anchorage.
8. 1847.
9. Alan Stevenson, engineer; Adair, contractor; McCormack, for Tower.
10. Sea light.
11. Stone, of ordinary colour; double walls.
12. Yes; copper rod.
13. 50 feet.
14. 46 feet.
15. About 7 nautic miles.
16. About 12 nautic miles.
17. S. by W. $\frac{1}{2}$ W. to N. $\frac{1}{2}$ E., westerly.
18. Fixed, white.
20. Going away of daylight to return.
21. Dioptric.
22. Fourth order.
23. None.
24. Letourneau, Paris.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 11 days.
29. 4,241*l.* 15*s.* 5*d.*
30. Finished.
31. Dimensions of lantern: diameter, $9\frac{1}{2}$ feet; height, $6\frac{1}{2}$ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 11*s.* 6*d.*; days wages.
34. 2*l.*; done by the keepers.
35. 50*l.* principal, 40*l.* assistant; 10*l.* each allowed for land.
36. See Drawing, No. 8, General Return.
37. About 6*l.* annually.
38. 111 and 114 gallons. $\frac{1}{2}$ gross of each of 2 sizes of wicks annually.
39. Colza. 1857, 4*s.* $1\frac{1}{2}$ *d.*; 1858, 3*s.* $4\frac{1}{2}$ *d.*
40. Circular web, 2 sizes, at a cost of 8*s.* 3*d.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 14*l.* 3*s.* 6*d.*; 1858, 157*l.* 16*s.* 5*d.*; total 1852, 531*l.* 5*s.* 6*d.*
44. 1852, 222*l.* 19*s.* 5*d.*; 1858, 212*l.* 6*s.* 9*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every half year.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil stored in cellar on ground floor.
54. Rain gauge, thermometer, and barometer.
55. None.
56. None.
57. Occasionally.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

89.

PLADDA,
ISLAND IN CLYDE.

4. Two lights in one building, 54 feet apart.
5. Named in Act 29 Geo. 3. c. 52.
6. Suggested by Merchant House, Greenock.
7. To guide vessels in the Clyde.
8. 1790.
9. Thomas Smith, engineer; Mr. Brown, Glasgow, contractor for new houses.
10. Sea light.
11. Stone, of natural colour.
12. No.
13. 95 and 43 feet.
14. 130 and 77 feet.
15. About 12 and 9 nautic miles.
16. About 18 and 15 nautic miles.
17. From N.W. by W. to N.E. by E., southerly.
18. Fixed, white.
20. Going away of daylight to return.
21. Catoptric.
22. First order; upper light 15 burners, lower light 11 burners.
23. None.
24. Swan and Neil, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Nine days.
29. Not known.
30. Finished.
31. Dimensions of lantern: high light, diameter, 12 feet; height, 7 feet. Low light, diameter, 11 feet; height, 7 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 1l. 10s. 10d.; days wages.
34. 2l.; done by the keepers.
35. 50l. principal; 40l. assistant; with land.
36. See Drawing, No. 1, General Return.
37. About 8l. 10s. annually.
38. 1,038 and 1,057 gallons. 19 gross of 1 size of wicks annually.
39. Colza. 1857, 4s. 1½d.; 1858, 3s. 4¼d.
40. Circular web, 1 size, at a cost of 3l. 3s. 4d. annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 719l. 12s. 0¼d.; 1858, 295l. 3s.; total 1852, 2,850l. 1s. 1¾d.
44. 1852, 384l. 8s. 2d.; 1858, 351l. 8s. 5d.
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every half year.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in each light room. Oil stored in cellar underground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

90.

DEVAAR, CAMPBEL-
TOWN.

4. One light.
5. 1836.
6. Provost and magistrates of Campbeltown.
7. To open entrance of Campbeltown Loch.
8. 1854.
9. Messrs. Stevenson, engineers; Messrs. Barr, Ardrossan, contractors.
10. Sea light.
11. Stone, of natural colour.
12. No.
13. 66 feet.
14. 120 feet.
15. 11½ nautic miles.
16. 17½ nautic miles.
17. About 104° from N. ¼ W. to E. by S. northerly.
18. Revolving, white.
19. Every half minute.
20. Going away of daylight to return.
21. Catadioptric Holophotal.
22. One holophotal on each face.
23. None.
24. See answer to 36.
25. Smoke tubes and apertures.
26. None.
27. None.
28. 9 days.
29. 4,916l. 6s. 4d., including apparatus; site 7l. 10s. per annum.
30. Finished.
31. Intermediate between 1st and 2d class. Vide Drawing, 15, General Return.
32. No.
33. None.
34. 2l.; done by the lightkeepers.
35. 50l. principal; 40l. assistant. 10l. each in place of land.
36. A great part of the apparatus in this case was got from the Commissioners store. Vide Drawing, 6, General Return.
37. 6l. 13s. 4d. annually.
38. 187 and 184 gallons. 3 gross of wicks annually.
39. Colza. 1857, 4s. 1½d.; 1858, 3s. 4¼d.
40. Circular web, cost 10s. annually.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852. 1858, 160l. 4s. 10d.
44. Not lighted in 1852. 1858, 217l. 11s. 6d.
45. None.
46. None.
47. None.
48. None.
49. Coastguard report half yearly.
50. Secretary and superintendent.
51. April, June, and August.
52. Yes. On 8th November 1858, for about a quarter of an hour; lightkeeper asleep; dismissed.
53. One. Oil stored in cellar off dwelling house.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

91.

SHIP ROCK, OF
SANDA, CLYDE.

4. One light.
5. 1829-30.
6. Irish Board.
7. To improve navigation of the Clyde.
8. 1850.
9. Alan Stevenson, engineer. Not built by contract.
10. Sea light.
11. Stone, of red colour; double walls.
12. Yes; copper rod.
13. 48 feet.
14. 165 feet.
15. About 14 nautic miles.
16. About 20 nautic miles.
17. From N.W. ¼ W. to S.E. by E. ½ E., south westerly.
18. Fixed, red.
20. Going away of daylight to return.
21. Dioptric, with auxiliary spherical mirrors. See Drawing, No. 13.
22. First order.
23. None.
24. Letourneau, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 26 days.
29. 11,931l. 10s. 2d.
30. Finished.
31. Dimensions of lantern: diameter, 12½ feet; height, 10 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2l.; done by the keepers.
35. 50l. principal; 40l. assistant; 10l. each allowed for land.
36. See Drawing, No. 13, General Return.
37. About 8l. 4s. annually.
38. 756 and 754 gallons. ¾ gross of each of the four sizes annually.
39. Colza. 1857, 4s. 1½d.; 1858, 3s. 4¼d.
40. Circular web, 4 sizes of wicks, at a cost of 21s. annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 908l. 10s. 5½d.; 1858, 396l. 10s. 2d.; total 1852, 3,473l. 4s. 5½d.
44. 1852, 338l. 1s. 4d.; 1858, 347l. 10s. 4d.
45. None.
46. None.
47. None.
48. None.
49. Coastguard reports half yearly.
50. Commissioners, Secretary, and Superintendent.
51. April, June, and August.
52. No.
53. One lamp in light room. Oil stored in the tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

92.

MULL OF KINTYRE,
ARGYLLSHIRE.

4. One light.
5. Named in original Act 1786.
7. A prominent headland.
8. 1787.
9. Thomas Smith, engineer; builder not known.
10. Sea light.
11. Stone, of natural colour; solid walls.
12. No.
13. 38 feet.
14. 297 feet.
15. About 18 nautic miles.
16. About 25 nautic miles.
17. From N.N.E. $\frac{1}{2}$ E. to S. by W. $\frac{1}{4}$ W. westward.
18. Fixed, white.
20. Going away of daylight to return.
21. Catoptric.
22. 20 burners.
24. Swan and Neil, Edinburgh, makers of original apparatus.
25. Smoke tubes, air apertures.
26. None.
27. None.
28. Fifteen days.
29. Not known.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. New dwelling-houses built at a total cost of 1,129*l.* 4*s.* 5*d.* by contract.
34. 2*l.*; done by the keepers.
35. 50*l.* principal; 40*l.* assistant; with land.
36. See Drawing, No. 1, General Return.
37. About 8*l.* annually.
38. 719 and 732 gallons. 15 gross of 1 size of wick annually.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. Circular web, 1 size at a cost of 2*l.* 10*s.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 438*l.* 16*s.* 6 $\frac{1}{2}$ *d.*; 1858, 256*l.* 18*s.* 6*d.*; total 1852, 1,590*l.* 19*s.* $\frac{1}{2}$ *d.*
44. 1852, 360*l.* 6*s.* 9*d.*; 1858, 390*l.* 9*s.* 3*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard return half yearly.
50. Commissioners, secretary, and superintendent.
51. April, June, August.
52. No.
53. One in light room. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

93.

RHINNS OF ISLAY,
WEST OF ISLAY.

4. One light.
5. 1823.
6. Shipowners of Greenock, Glasgow, Liverpool, Belfast, &c. &c.
7. To point out the locality.
8. 1825.
9. Robert Stevenson, engineer; J. Gibb, Aberdeen, contractor.
10. Sea light.
11. Stone, of natural colour; double walls.
12. Yes; copper rod.
13. 96 feet.
14. 150 feet.
15. About 13 nautic miles.
16. About 19 nautic miles.
17. From N.N.E. to S.E., westerly.
18. Flashing.
19. Every five seconds.
20. Going away of daylight to return.
21. Catoptric.
22. Twenty-four burners.
23. None.
24. Clark, Slight, and Lillie; and others.
25. Smoke tubes and air apertures.
26. None.
28. Twenty-six days.
29. 8,056*l.* 6*s.* 5*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2*l.*; done by the keepers.
35. 50*l.* principal; 40*l.* assistant; with land.
36. See Drawing, No. 3, General Return.
37. About 8*l.* annually.
38. 841 and 810 gallons. 18 gross of 1 size of wick annually.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. Circular web, 1 size, at a cost of 3*l.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 367*l.* 16*s.* 1*d.*; 1858, 263*l.* 1*s.* 2*d.*; total 1852, 1,336*l.* 9*s.* 10*d.*
44. 1852, 415*l.* 2*s.* 9*d.*; 1858, 310*l.* 12*s.* 5*d.*
45. None.
46. None.
47. None.
48. None.
49. Half-yearly reports by coastguard and cruisers.
50. Commissioners, secretary, and superintendent.
51. April, June, August.
52. No.
53. One in lightroom. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

94.

RHU VAAL,
SOUND OF ISLAY.

4. One light.
5. 1853.
6. Trinity House.
7. To lead to north entrance of Sound of Islay.
8. 1st January 1859.
9. Messrs. Stevenson, engineers; A. Maedonald, contractor.
10. Sea light.
11. Brick; painted white.
12. Yes; copper rod.
13. 113 feet.
14. 147 feet.
15. About 13 nautic miles.
16. About 19 nautic miles.
17. From N.N.W. $\frac{1}{4}$ N. to N.N.E. $\frac{1}{4}$ E., red; white from N.N.E. $\frac{1}{4}$ E. to S.S.W. eastward.
18. Fixed, white and red, as above.
20. Going away of daylight to return.
21. Dioptric.
22. Second class.
23. None.
24. Chance, Brothers, Birmingham.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Not lighted till 1859.
29. 7,437*l.* 4*s.* 9*d.*
30. Finished.
31. Dimensions of lantern: diameter, 9 $\frac{1}{2}$ feet; height, 6 $\frac{1}{2}$ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. Lighted subsequently.
34. Not lighted a year.
35. 50*l.* principal; 40*l.* assistant; 10*l.* each for land.
36. See Drawing, No. 8, General Return.
37. Not lighted till 1859.
38. Ditto.
39. Ditto.
40. Ditto.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted till after Midsummer 1858.
44. Does not apply.
45. None.
46. None.
47. None.
48. Correspondence already furnished.
49. None.
50. Not lighted till 1859.
51. April, June, August.
52. No.
53. One in lightroom. Oil stored in cellar on ground floor.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

95.

LISMORE,
ARGYLLSHIRE.

4. One light.
5. 1829.
6. Not known.
7. To open the route to the Caledonian Canal.
8. 1833.
9. Robert Stevenson, engineer; J. Smith, Inverness, contractor.
10. Sea light.
11. Stone, of natural colour; double walls.
12. No.
13. 86 feet.
14. 103 feet.
15. About 11 nautic miles.
16. About 17 nautic milcs.
17. From E. to N.E. by E., southward and eastward.
18. Fixed, white.
20. From going away of daylight to return.
21. Catoptric.
22. First order.
23. None.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Twenty-four days.
29. 11,229*l.* 10*s.* 5*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2*l.*; done by the keepers.
35. 50*l.* principal; 40*l.* assistant. Land.
36. See Drawing, No. 1, General Return.
37. About 8*l.* annually.
38. 738 and 741 gallons. 13½ gross of 1 size of wick annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4¼*d.*
40. Circular web, 1 size of wick, at a cost of 45*s.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 70*l.* 3*s.* 7¾*d.*; 1858, 7*l.* 6*s.* 5*d.*; total 1852, 263*l.* 3*s.* 1*d.*
44. 1852, 407*l.* 3*s.* 8*d.*; 1858, 310*l.* 18*s.* 6*d.*
45. None.
46. None.
47. None.
48. None.
49. Return every six months by the coastguard.
50. Commissioner, secretary, and superintendent.
51. April, June, August.
52. No.
53. One in lightroom. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

96.

SOUND OF MULL,
ARGYLLSHIRE.

4. One light.
5. 1854. In view in 1834.
6. The Commissioners.
7. To open the Sound.
8. 10th November 1857.
9. Messrs. Stevenson, engineers; A. Macdonald, contractor.
10. Sea light.
11. Brick; coloured white.
12. Yes; copper red.
13. 63 feet.
14. 55 feet.
15. About 8 nautic miles.
16. About 13 nautic miles.
17. From N.W. by N. to S. by E., northerly.
18. Fixed, red towards sea, green towards New Rocks, &c., white southwards.
20. From going away of daylight to return.
21. Dioptric, azimuthal-condensing.
22. Fourth order.
23. None.
24. Sautter, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Six days.
29. 6,277*l.* 15*s.* 7*d.*
30. Finished.
31. Dimensions of lantern: diameter, 9½ feet; height, 6½ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. Not lighted till towards the end of 1857.
34. Not lighted till near end of 1857.
35. 50*l.* principal, 40*l.* assistant; 10*l.* each in place of land.
36. See Drawing, No. 12, General Return.
37. About 6*l.* annually.
38. 213 gallons. ¾ gross of each of the 2 sizes annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4¼*d.*
40. Circular web; two sizes of wicks, at a cost of 8*s.* 3*d.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852; 1858, 3*l.* 15*s.*
44. Not lighted in 1852; 1858, 234*l.* 11*s.* 1*d.*
45. None.
46. None.
47. None.
48. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in lightroom. Oil stored in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

97.

ARDNAMURCHAN,
ARGYLLSHIRE.

4. One light.
5. 1832.
6. Sir J. M. Riddell, of Ardnamurchan, Bart.
7. To mark the headland.
8. 1849.
9. Alan Stevenson, engineer; R. Hume, Gatchouse, contractor.
10. Sea light.
11. Stone; ordinary colour, double walls.
12. Yes; copper rod.
13. 118 feet.
14. 180 feet.
15. About 14 nautic miles.
16. About 20 nautic miles.
17. From N.E. by E. ¾ E. W.S.W. by S., north and westward.
18. Fixed, white.
20. From going away of daylight to return.
21. Dioptric, with auxiliary spherical mirrors. See Drawing, No. 13.
22. First order.
23. None.
24. Letourneau, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Thirteen days.
29. 13,738*l.* 0*s.* 10*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12½ feet; height, 10 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2*l.*; done by the keepers.
35. 50*l.* principal, 40*l.* assistant; 10*l.* to each keeper in place of ground.
36. See Drawing, No. 13, General Return.
37. About 8*l.* 4*s.* annually.
38. 753 and 753 gallons. ¾ gross of each of the four sizes annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4¼*d.*
40. Circular web, four sizes of wicks, at a cost of 21*s.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 212*l.* 14*s.* 9¾*d.*; 1858, 154*l.* 0*s.* 8*d.*; total 1852, 666*l.* 9*s.* 10½*d.*
44. 1852, 521*l.* 5*s.* 10*d.*; 1858, 328*l.* 0*s.* 10*d.*
45. None.
46. None.
47. None.
48. None.
50. Commissioners, secretary, and superintendent.
51. April, June, August.
52. No.
53. A spare lamp in lightroom; oil stored in cellar under ground.
54. Rain gauge, barometer and thermometer.
55. None.
56. None.
57. Occasionally.

98.

ORONSAY, SOUND OF
SLEAT, SKYE.

4. One light.
5. 1854. In view in 1834.
6. Commissioners.
7. To improve the navigation of Inner Sounds.
8. 10th November 1857.
9. Messrs. Stevenson, engineers; W. Kinghorn, Leith, contractor.
10. Sea light.
11. Brick; coloured white; solid walls.
12. Yes; copper rod.
13. 63 feet.
14. 58 feet.
15. About 8 nautic miles.
16. About 13 nautic miles.
17. From E.N.E. $\frac{1}{2}$ E. to S.W. by W. $\frac{1}{2}$ W., southward.
18. Fixed, white.
20. Going away of daylight to return.
21. Dioptric, azimuthal-condensing.
22. Fourth order.
23. None.
24. Sautter, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Fourteen days.
29. 4,527*l.* 17*s.* 10*d.*
30. Finished.
31. Dimensions of lantern: diameter, 9 $\frac{1}{2}$ feet; height, 6 $\frac{1}{2}$ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. Lighted in end of 1857.
34. Lighted in end of 1857.
35. 50*l.* principal, 40*l.* assistant; 10*l.* each for land.
36. See Drawing, No. 12, General Return.
37. About 6*l.* annually.
38. 200 gallons. $\frac{3}{4}$ gross of each of the two sizes annually.
39. Colza, 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. Circular web, 2 sizes, at a cost of 8*s.* 3*d.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852; 1858, 3*l.* 2*s.* 3*d.*
44. Not lighted in 1852; 1858, 211*l.* 3*s.* 10*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in lightroom. Oil store in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

99.

KYLEAKIN,
SOUND OF SKYE.

4. One light.
5. 1850: in view in 1834.
6. Fishery Board, and others.
7. To guide through inner Sounds.
8. 10th November 1857.
9. Messrs. Stevenson, engineers; W. Kinghorn, Leith, Contractor.
10. Sea light.
11. Brick, painted white; solid walls.
12. Yes, copper rod.
13. 70 feet.
14. 53 feet.
15. About 8 nautic miles.
16. About 13 nautic miles.
17. From N.N.E. $\frac{1}{2}$ E. to S.E. by E., northerly and southerly.
18. Fixed white in Sound of Lochalsb and Applecross; fixed red along the shore of Skye and east side of Applecross Sound.
20. Going away of daylight to return
21. Dioptric, azimuthal-condensing.
22. 4th order.
23. None.
24. Sautter, Paris; Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Sixteen days.
29. 6,210*l.* 19*s.*
30. Finished.
31. Dimensions of lantern, diameter 9 $\frac{1}{2}$ feet; height, 6 $\frac{1}{2}$ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. Lighted in end of 1857.
34. Lighted in end of 1857.
35. 50*l.* principal; 40*l.* assistant. 8*l.* each in place of land.
36. See Drawing, No. 12, General Return.
37. About 6*l.* annually.
38. 218 gallons. $\frac{3}{4}$ gross of each size annually of wicks, 2 kinds.
39. Colza, 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. Circular web, 2 sizes, at a cost of 8*s.* 3*d.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852; 3*l.* 1*s.* 9*d.* in 1858.
44. Not lighted in 1852; 205*l.* 12*s.* 8*d.* in 1858.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room: oil stored in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

100.

SOUTH RONA,
OFF APPECROSS.

4. One light.
5. 1853.
6. Commissioners and Board of Trade.
7. To guide to north entrance of inner Sounds.
8. 10th November 1857.
9. Messrs. Stevenson, engineer; W. Kinghorn, Leith, contractor.
10. Sea light.
11. Brick, painted white.
12. Yes, copper rod.
13. 42 feet.
14. 222 feet.
15. About 16 nautic miles.
16. About 22 nautic miles.
17. All round.
18. Flashing white.
19. Every twelve seconds.
20. Going away of daylight to return.
21. Catadioptric holophotal.
22. Second order.
23. None.
24. Chance, Birmingham, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Nine days.
29. 5,063*l.* 4*s.* 10*d.*
30. Finished.
31. Dimensions of lantern: diameter 9 $\frac{1}{2}$ feet, height 6 $\frac{1}{2}$ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. Lighted in the end of 1857.
34. Lighted in the end of 1857.
35. 50*l.* principal, 40*l.* assistant. 10*l.* each for land.
36. See Drawing, No. 6, General Return.
37. About 6*l.* 10*s.* annually.
38. 406 gallons. 7 $\frac{1}{2}$ gross of one size of wick, annually.
39. Colza, 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. Circular web, one size, at a cost of 25*s.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852; 1858, 3*l.* 0*s.* 7*d.*
44. Not lighted in 1852; 1858, 301*l.* 17*s.* 9*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room; oil stored in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

101.

SKERRYVORE,
OFF TYREE.

4. One light.
5. Specified in Act 54 Geo. III., cap. 136.
7. To mark the dangerous sunken rocks.
8. 1st February 1844.
9. Alan Stevenson, engineer; built by days' wages, under his directions.
10. Sea light.
11. Stone, of natural colour; walls solid.
12. Yes; copper rod.
13. 158 feet.
14. 150 feet.
15. 13 nautic miles.
16. 19 nautic miles.
17. All round.
18. Revolving, white.
19. Once every minute.
20. Going away of daylight to return.
21. Dioptric system of Fresnel.
22. First order.
23. None.
24. Letourneau, Paris.
25. Smoke tubes and air apertures.
26. A bell on the gallery.
27. Six days.
28. Six days.
29. 86,977*l.* 17*s.* 7*d.*, including apparatus and harbour at Hymsh.
30. Finished.
31. First class. Vide Drawing, 15, General Return.
32. No.
33. 2*l.* 14*s.* 4*d.*, days' wages.
34. 2*l.*; done by the lightkeepers.
35. Four keepers, principal, 73*l.* 10*s.*, 1st assistant, 65*l.*; 2d assistant, 60*l.*; 3d assistant, 60*l.* Rations on the rock and allowance of land.
36. Cost of apparatus; lantern, including machinery for ringing fog bells, 3,851*l.* 5*s.* 6*d.* Vide Drawing No. 9, General Return, for apparatus.
37. 9*l.* 4*s.* annually.
38. 781 and 760 gallons. $\frac{3}{4}$ gross of each of the 4 sizes annually.
39. Colza. 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*½d.*
40. Circular web, 4 sizes, at a cost of 2*l.*s. per year.
41. Not known.
42. Mercantile Marine Fund.
43. 1852 and 1858, 644*l.* 5*s.* 2*½d.*, 564*l.* 10*s.* 11*d.*; total 1852, 2,530*l.* 7*s.* 7*d.*
44. 1852, 819*l.* 16*s.* 4*d.*; 1858, 679*l.* 4*s.* 10*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Secretary and superintendent.
51. April, June, and August.
52. No.
53. One in light room; oil stored in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. Hoist a ball at 10 o'clock, if all well, to the shore establishment.
57. One keeper, once in six weeks.

102.

BARRAHEAD, LONG
ISLAND.

4. One light.
5. Very early date—end of 1799.
6. Shipowners of Glasgow.
7. The southern extremity of the Hebrides.
8. 1833.
9. Robert Stevenson, engineer; James Smith, Inverness, contractor.
10. Sea light.
11. Stone, of natural colour.
12. No.
13. 60 feet.
14. 680 feet.
15. About 23 nautic miles.
16. About 35 nautic miles.
17. N. by E. to E.N.E., westward and southward.
18. Intermittent.
19. White $\frac{2}{3}$ minutes, then suddenly eclipsed half a minute.
20. Going away of daylight to return.
21. Catoptric.
22. First order.
23. None.
24. Clarke, Edinburgh; and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 126 days.
29. 13,087*l.* 13*s.* 11*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height 8 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 2*l.* 13*s.* 11*d.*; days wages.
34. 2*l.*; done by the keepers.
35. 55*l.* principal; 40*l.* assistant; 40*l.* second ditto. Land allowed.
36. See Drawing, No. 5, General Return.
37. About 8*l.* annually.
38. 791 and 788 gallons. 15 gross of 1 size of wicks annually.
39. Colza. 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*½d.*
40. Circular web, 1 size, at a cost of 2*l.* 10*s.* annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 190*l.* 16*s.* 10*½d.*; 1858, 196*l.* 7*s.*; total, 1852, 816*l.* 13*s.* 10*½d.*
44. 1852, 491*l.* 11*s.*; 403*l.* 5*s.* 1*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

103.

USHENISH, SOUTH
UIST.

4. One light.
5. In 1854.
6. The late Admiral Beechy.
7. A guide through the Minch.
8. 10th November 1857.
9. Messrs. Stevenson, engineers; A. Macdonald, Skye, contractor.
10. Sea light.
11. Brick, painted white.
12. Yes, copper rod.
13. 39 feet.
14. 176 feet.
15. About 14 nautic miles.
16. About 20 nautic miles.
17. From S.S.W. to N.E. by southward and eastward.
18. Fixed, red.
20. Going away of daylight to return.
21. Dioptric, with auxiliary spherical mirrors. See Drawing, No. 13.
22. First class.
23. None.
24. Letourneau, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 21 days.
29. 8,800*l.* 4*s.* 3*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12½ feet; height, 10 feet. For Price, see Drawing, No. 15, of General Return.
32. No.
33. Lighted 10th November 1857.
35. 50*l.* principal; 40*l.* assistant. 10*l.* for land each. 7*l.* for fuel (peat).
36. See Drawings, No. 8 and 13, General Return.
37. Not lighted for a year.
38. Only two months of 1858; will be same as Island Glass.
39. 1858. Colza. 3*s.* 4*½d.*
40. Same as Island Glass when lighted.
41. Nil.
42. Mercantile Marine Fund.
43. 1858, 141*l.* 17*s.* 4*d.*
44. Not lighted in 1852. 1858, 370*l.* 10*s.* 6*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil stored on ground floor.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

104.

ISLAND GLASS,
HARRIS.

4. One light.
5. Named in original Act, 1786.
7. To lead through the Minch.
8. 1789.
9. Thos. Smith, Engineer; builder not known.
10. Sea Light.
11. Stone, of natural colour.
12. Yes; rod of copper.
13. 100 feet.
14. 130 feet.
15. About 12 nautic miles.
16. About 18 nautic miles.
17. From W. by S. to E. N.E. $\frac{1}{2}$ E., southward.
18. Fixed, white.
20. From going away of daylight to return.
21. Dioptric, with auxiliary spherical mirrors. See Drawing, No. 13.
22. First order.
23. Rebuilt in —; dioptric substituted for catoptric in 1852.
24. Letourneau, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Seven days.
29. Not known.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing No. 15, General Return.
32. No.
33. None.
34. 2l. done by lightkeepers.
35. 50l. principal, 40l. assistant; land allowed.
36. See Drawing No. 13, General Return
37. About 8l. 4s. annually.
38. 765 and 744 gallons. $\frac{3}{4}$ gross of each of the 4 sizes annually.
39. Colza, 1857, 4s. 1½d.; 1858, 3s. 4½d.
40. Circular web, 4 sizes of wick, at a cost of 21s. per year.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 207l. 13s. 6½d.; 1858, 154l. 15s.; total 1852, 646l. 6s. 1d.
44. 1852, 352l. 10s. 11d.; 1858, 317l.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and inspector.
51. April, June, and August.
52. No.
53. One in Light room. Oil kept in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

105.

STORNOWAY, LEWIS.

4. One light and an Apparent light for Arnish Rock.
5. 1825-6.
6. Mr. Stewart Mackenzie.
7. To open the anchorage of Stornoway Bay.
8. 1852.
9. Alan Stevenson, engineer; James Scott, contractor for house; Hoby and Co., contractors for iron tower.
10. Sea light.
11. Iron tower, painted stone colour.
12. Yes; copper rod.
13. 45 feet.
14. 56 feet.
15. About 8 nautic miles.
16. About 13 nautic miles.
17. N.N.E. to N.W. by N. $\frac{1}{2}$ N., easterly.
18. Revolving, white.
19. Every half minute.
20. From going away of daylight to return.
21. Catadioptric, holophotal, with a holothepe for beacon light. See Drawing, No. 11.
22. 4 holophotal reflectors.
23. None.
24. Sautter, Paris; Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 6 days.
29. 6,30l. 19s. 5d.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 7 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 6l. 1s. 6d., partly by contract.
34. 2l.; done by the keepers.
35. 50l. principal, 40l. assistants; 10l. each in place of land.
36. See Drawings, No. 6 and 11, General Return.
37. About 6l.
38. 219 and 221 gallons; 4½ gross of 1 kind, annually.
39. Colza, 1857, 4s. 1½d.; 1858, 3s. 4½d.
40. About 15s. annually; circular web, 1 size.
41. Nil.
42. Mercantile Marine Fund.
43. 1858, 154l. 17s. 1d.
44. 1852, 154l. 15s. 9d.; 1858, 248l. 1s. 11d.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil in cellar on ground floor of dwellings.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

106.

CAPE WRATH,
SUTHERLAND.

4. One light.
5. Named in Act 54 Geo. 111.
6. The north-west turning point of Scotland.
8. 1828.
9. Robert Stevenson, engineer; John Gibb, contractor.
10. Sea light.
11. Stone, of natural colour; double walls.
12. No.
13. 65 feet.
14. 400 feet.
15. About 21 nautic miles.
16. About 28 nautic miles.
17. S.E. $\frac{1}{2}$ E. to S.W. by W., northerly.
18. Revolving; alternate red and white.
19. Every minute.
20. From going away of daylight to return.
21. Catoptric.
22. First order.
23. None.
24. Clark, Edinburgh, and others; Slight and Lillie.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 40 days.
29. 13,550l. 18s. 9d.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. 9s. 5d., days wages.
34. 2l.; done by the keepers.
35. 50l. principal, 40l. assistant; land allowed.
36. See Drawing, No. 4, General Return.
37. About 8l. annually.
38. 762 and 762 gallons; 15 gross of one size of wick annually.
39. Colza, 1857, 4s. 1½d.; 1858, 3s. 4½d.
40. Circular web; 1 size, at a cost of 2l. 10s. annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 281l. 1s. 9½d.; 1858, 197l. 8s. 11d.; total 1852, 903l. 18s. 4d.
44. 1852, 454l. 2s. 6d.; 1858, 381l. 0s. 11d.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in the light room. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. No, not applicable.
56. None.
57. Occasionally.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

107.

DUNNETHEAD,
CAITHNESS.

4. One light.
5. 1824.
6. Mr. Stevenson, engineer to the Board.
7. To open entrance to the Pentland Firth, and to prevent vessels mistaking Dunnetbay for the Firth.
8. 1831.
9. Robert Stevenson, engineer; built by contract: James Smith, Inverness, contractor.
10. Sea light.
11. Stone, of natural colour; double walls.
12. Yes; copper rod.
13. 66 feet.
14. 346 feet.
15. About 20 nautic miles.
16. About 26 nautic miles.
17. S.E. $\frac{1}{2}$ E. to W. by N. $\frac{1}{2}$ N. northerly.
18. Fixed, white.
20. Going away of daylight to return.
21. Dioptric, with auxiliary spherical mirrors. See Drawing, No. 13.
22. One order.
23. Changed from catoptric to dioptric in 1852.
24. Letourneau, Paris, and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 34 days.
29. 9,135*l.* 15*s.* 3*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet; General Return, Drawing 15.
32. No.
33. None.
34. 2*l.*; done by lightkeepers.
35. 50*l.*, principal; 40*l.*, assistants; with land.
36. See Drawing, No. 13, General Return.
37. About 8*l.* 4*s.* annually.
38. 771 and 780 gallons; $\frac{2}{3}$ gross of each of the 4 sizes annually.
39. Colza, 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*½d.*
40. Circular web, 4 sizes of wicks, at a cost of 2*l.*s. annually.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 292*l.* 1*s.* 3*½d.*; 1858, 200*l.* 13*s.* 8*d.*; total 1852, 953*l.* 2*s.* 9*¾d.*
44. 1852, 379*l.* 18*s.* 1*d.*; 1858, 336*l.* 0*s.* 11*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and inspector.
51. April, June, and August.
52. No.
53. One in light room. Oil in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None; not applicable.
56. None.
57. Occasionally.

108.

NORTH UNST, SHET-
LAND.

4. One light.
5. In view in 1834, but applied for in 1853.
6. Admiralty.
7. To protect Her Majesty's ships in the northern war.
8. 1855, temporary building. 1858, 1859, January, permanent do.
9. Messrs. Stevenson, engineers. Built by day wages under their direction.
10. Sea light.
11. Brick painted white; walls solid.
12. Copper rod conductor.
13. 64 feet.
14. 230 feet.
15. 16 nautic miles.
16. 22 nautic miles.
17. Fixed; white all round, except for about 34° from S.E. by E. $\frac{1}{2}$ E. southerly to S.S.E. $\frac{1}{2}$ E. light red.
18. Fixed.
20. From going away of daylight to return.
21. Dioptric.
22. First order.
23. None, except the substitution of permanent for temporary light.
24. Letourneau, Paris; fitted up by Messrs. Milne and Son, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 33 days.
29. 32,478*l.* 15*s.* 5*d.*, including apparatus and site, 100*l.*
30. Finished.
31. 1st class; vide Drawing, 15. General Return.
32. No.
33. None as yet.
34. 2*l.*; done by the keepers.
35. 60*l.* principal, 50*l.* 1st assistant, 45*l.* 2d assistant, 45*l.* 3d assistant, 10*l.* each in place of ground.
36. 1st class, vide Drawing 8, General Return.
37. 9*l.* 4*s.* annually.
38. 752 gallons in 1858, $\frac{2}{3}$ gross of each of the four sizes per year.
39. Colza, 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*½d.*
40. Circular web, 4 sizes of wicks, at a cost of 1*l.* 1*s.* per year.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852; 1858, 58*l.* 6*s.* 10*d.*
44. Not lighted in 1852; 1858, 687*l.* 17*s.* 2*d.*
45. None.
46. None.
47. None.
48. Copy of correspondence with the Board of Trade as to site produced.
49. None.
50. Secretary and superintendent.
51. April, June, and August.
52. No.
53. One in the light room. Oil stored in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. See separate correspondence as to this.
57. Once a fortnight, one at a time.

109.

WHALSEY SKERRIES,
SHETLAND.

4. One light.
5. Originally by Commissioners of Supply, 1834, but subsequently in 1853.
6. By the Admiralty for the protection of H.M. ships.
7. As a guide for the eastern side of Shetland.
8. 1856. Temporarily from the island of Gruna; permanent lights, December 1, 1858.
9. Messrs. Stevenson, engineers; Wm. Kinghorn, Leith, builder, by contract.
10. Sea light.
11. Stone tower, painted white; wall solid.
12. Yes; copper rod.
13. 99 feet.
14. 145 feet.
15. 13 nautic miles.
16. 18 $\frac{1}{2}$ nautic miles.
17. All round the compass.
18. Revolving white.
19. Once a minute.
20. From going away of daylight to return.
21. Dioptric, holophotal.
22. First order.
23. None, except the substitution of permanent for temporary light.
24. Messrs. Chance, Birmingham, and Messrs. Milne and Son, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 31 days.
29. 21,450*l.* 18*s.* 2*d.*, including apparatus and site; 300*l.* Island of Gruna.
30. Finished.
31. Vide Drawing, No. 15, General Return.
32. No.
33. None.
34. None as yet.
35. Principal, 60*l.*; 1 assistant, 45*l.*, 2 assistants, 45*l.*
36. Vide Drawing 10, General Return.
37. None as yet.
38. The light was only temporary during three years, in future will be about the same as Skerryvore.
39. 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*½d.*
40. Will in future be the same as Skerryvore.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852. 1858, 63*l.* 8*s.* 10*d.*
44. Not lighted in 1852. 355*l.* 8*s.* 9*d.* in 1858.
45. None.
46. None.
47. None.
48. Copy of correspondence with Board of Trade produced.
49. None.
50. Secretary and superintendent.
51. April, June, and August.
52. No.
53. One for lightroom. Oil stored in the Tower.
54. Rain gauge, barometer, and thermometer.
55. No.
56. Flag to hoist.
57. Relieved once a week, one at a time.

110.

BRESSAY SOUND,
ENTRANCE TO
LERWICK, SHETLAND.

4. One light.
5. Not known.
6. Shipowners of Lerwick.
7. To open Lerwick anchorage.
8. 1858 (30 August).
9. Messrs. Stevenson, engineers; A. Wilson, contractor.
10. Sea light.
11. Brick, coloured white.
12. Yes; copper rod.
13. 53 feet.
14. 105 feet.
15. About 11 nautic miles.
16. About 17 nautic miles.
17. All round the compass.
18. Revolving, red and white.
19. Intervals of one minute.
20. From going away of daylight to return.
21. Catadioptric holophotal.
22. Second order.
23. None.
24. Messrs. Chance, Birmingham, and Messrs. Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 10 days from 30th August.
29. 5,163*l.* 7*s.* 6*d.*
30. Finished.
31. Dimensions of lantern: diameter, 9½ feet; height, 6½ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. Not a year lighted.
35. 50*l.* principal; 40*l.* assistant; 10*l.* each for land.
36. See Drawing, No. 6, General Return.
37. Not a year lighted.
38. Do.
39. Colza. 1858, 3*s.* 4½*d.*
40. Not a year lighted.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted.
44. 1858, 1861. 7*s.* 10*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. 1858; Secretary and superintendent.
51. April, June, and August.
52. No.
53. One in lightroom. Oil cellar with dwelling house.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

111.

SUMBURGH HEAD,
SHETLAND.

4. One light.
5. 1818.
6. Sheriff of Orkney and Zetland.
7. The southern extremity of the Shetland Isles.
8. 1821.
9. Robert Stevenson, engineer; John Reid, Peterhead, contractor.
10. Sea light.
11. Stone, natural colour; double walls.
12. No.
13. 55 feet.
14. 300 feet.
15. About 18 nautic miles.
16. About 25 nautic miles.
17. From N.E. by E. ¼ E., to N.W. by N. ¼ N., southward.
18. Fixed.
20. From going away of daylight to return.
21. Catoptric.
22. First order, 27.
23. None.
24. Swan and Neil.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Forty-nine days.
29. 10,087*l.* 1*s.* 11*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet; for price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2*l.*; done by lightkeepers.
35. 50*l.* principal, 40*l.* assistant. Land at the station.
36. See Drawing No. 1, General Return.
37. About 9*l.* annually.
38. 930 and 910 gallons; 19 gross annually, of 1 size.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. About 3*l.* 3*s.* 4*d.* annually of cotton wick, circular web, 1 size.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 56*l.* 2*s.* 6½*d.*; 1858, 32*l.*; total 1852, 277*l.* 10*s.* 5½*d.*
44. 1852, 422*l.* 10*s.* 3*d.*; 1858, 346*l.* 15*s.* 11*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in the light room: oil cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None used.
56. None; not required.
57. Occasionally.

112.

NORTH RONALD-
SHAY, ORKNEY.

4. One light.
5. Not known. Specified in original Act, 1786.
7. Northern point of Orkney.
8. 1789; altered to beacon in 1806; lighthouse rebuilt, and light re-exhibited 1854.
9. Thomas Smith, original light; Alan Stevenson, renewal; Wm. Kinghorn, Leith, contractor.
10. Sea light.
11. Brick, double walls, natural colour.
12. No.
13. 139 feet.
14. 140 feet.
15. 12½ nautic miles.
16. 18½ nautic miles.
17. All round the compass.
18. Flashing.
19. Every ten seconds.
20. From going away of daylight to return.
21. Dioptric holophotal.
22. First order.
23. Exhibited in 1854.
24. Letourneau, Paris.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Twenty-three days.
29. 12,927*l.* 19*s.* 4*d.*, including apparatus; feu, 5*l.* per annum.
30. Finished.
31. First class. Vide Drawing, 15, General Return.
32. No.
33. None.
34. 2*l.*; done by the lightkeepers.
35. principal, 50*l.*; assistant 40*l.*; 10*l.* each for land.
36. First class. Vide Drawing, No. 10, General Return.
37. 8*l.* 4*s.* annually.
38. 787 and 768 gallons; ¾ gross of each of the 4 numbers annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. Circular web, 4 sizes of wicks, at a cost of 21*s.* per annum.
41. Nil.
42. Mercantile Marine Fund.
43. Not lighted in 1852; 1858, 212*l.* 19*s.*
44. 1852, nil.; 1858, 321*l.* 7*s.* 5*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Superintendent and secretary.
51. April, June, and August.
52. No.
53. One in the light room; oil stored in room adjoining the dwelling-house.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

113.

START POINT,
SANDAY, ORKNEY.

4. One light.
5. 1801, originally a beacon.
6. Not known.
7. To obviate wrecks in the rapid tide-ways.
8. Beacon; altered to a lighthouse in 1806.
9. Robert Stevenson, engineer; George Peebles, builder.
10. Sea light.
11. Stone, natural colour.
12. Yes, copper rod.
13. 91 feet.
14. 100 feet.
15. About 11 nautic miles.
16. About 16 nautic miles.
17. All round the compass.
18. Originally revolving, but on the re-erection of N. Ronaldshay, in 1854, altered to fixed white.
20. From going away of daylight.
21. Dioptric.
22. Fourth class.
23. Alteration from catoptric revolving to dioptric fixed; suggestion of engineer in 1854.
24. Sautter, Paris; Milne, Edinburgh.
25. Smoke tubes, and air apertures.
26. None.
27. None.
28. Twenty-six days.
30. Finished.
31. Dimensions of lantern: diameter, 9 feet; height, 5 feet; for price, see Drawing No. 15, General Return.
32. No.
33. Light altered, and new dwellings erected, at a cost of 827*l.* 5*s.* 8*d.*
34. 2*l.*; done by lightkeepers.
35. Two, 50*l.*; 40*l.*; land allowed.
36. See Drawing No. 8, General Return.
37. About 6*l.* annually.
38. 173 and 167 gallons. $\frac{3}{4}$ gross of each of 2 sizes annually.
39. Colza. 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*¼d.*
40. About 8*s.* 3*d.* annually. Cotton wick, circular web, 2 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 284*l.* 5*s.* 5*d.*; 1858, 212*l.* 19*s.*; total, 1852, 1,007*l.* 0*s.* 1*¼d.*
44. 1852, 290*l.* 4*s.* 4*d.*; 1858, 259*l.* 19*s.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in light room. Oil in ground floor.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

114.

HOY (LOW) LIGHT,
GRAEMSAY, ORKNEY.

4. Two lights (high light given separately).
5. Previous to 1834.
6. Shipowners of Orkney.
7. To guide to Stromness anchorage.
8. 1851.
9. Mr. Alan Stevenson, engineer; A. Wilson, Granton, contractor.
10. Sea light.
11. Stone; natural colour.
13. Yes; copper rod.
13. 38 feet.
14. 55 feet.
15. About 8 nautic miles.
16. About 13 nautic miles.
17. E. $\frac{1}{2}$ S. to W. $\frac{1}{2}$ N., northerly.
18. Fixed; white.
20. From going away of daylight to return.
21. Catadioptric holophotal, and dioptric.
22. Fourth order.
23. None.
24. Milne, Edinburgh; and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Thirty-one days.
29. Included in cost of High Tower.
30. Finished.
31. Dimensions of lantern: 12 $\frac{1}{2}$ feet; height, 10 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. No.
34. 2*l.*; done by lightkeepers.
35. 50*l.* principal, 40*l.* assistant. 10*l.* each for land.
36. See Drawing, No. 8, General Return.
37. About 6*l.* annually.
38. 139 and 123 gallons, $\frac{3}{4}$ gross of each of the two sizes annually.
39. Colza. 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*¼d.*
40. About 8*s.* 3*d.* annually; cotton wick, circular web, 2 sizes.
41. None.
42. Mercantile Marine Fund.
43. 1852, 140*l.* 12*s.* 4*¼d.*; 1858, 100*l.* 7*s.* 0*½d.*; 1852, 451*l.* 19*s.* 4*¼d.*
44. 1852, 461*l.* 15*s.* 1*d.*; 1858, 405*l.* 8*s.* 9*d.* for both lights. No separate account kept for each.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and September.
52. No.
53. One in lightroom. Oil cell: on surface.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

115.

HOY (HIGH), GRAEM-
SAY, ORKNEY.

4. Two lights (low light given separately).
5. Previous to 1834.
6. Shipowners of Orkney.
7. To lead to the anchorage of Stromness.
8. 1851.
9. Mr. A. Stevenson, engineer; Mr. A. Wilson, contractor.
10. Sea light.
11. Stone of natural colour.
12. Yes, copper rod.
13. 108 feet.
14. 115 feet.
15. About 11 nautic miles.
16. About 17 nautic miles.
17. From S.E. by E. to S.E. $\frac{1}{2}$ S., red; from S.S.E. $\frac{1}{2}$ E. to W.S.W., and from N. $\frac{1}{4}$ W. to N.N.W. $\frac{1}{2}$ W. white.
18. Fixed.
20. From going away of daylight to return.
21. Catadioptric holophotal, and catoptric.
22. Fourth order dioptric, large holophotal reflector, and a 25° reflector.
23. None.
24. Milne, Edinburgh; and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Fourteen days.
29. 15,880*l.* 19*s.* 7*d.*, including low light also.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet 6 in.; height, 10 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 2*l.*; done by lightkeepers.
35. 50*l.* principal, 40*l.* assistant. 10*l.* each for ground.
36. See Drawings Nos. 7, 8, and 2, General Return.
37. About 7*l.* 10*s.* annually.
38. 260 and 255 gallons, 1 $\frac{1}{2}$ gross of each of two sizes annually; $\frac{3}{4}$ do. of one size annually.
39. Colza. 1857, 4*s.* 1*½d.*; 1858, 3*s.* 4*¼d.*
40. About 19*s.* annually; cotton wick, circular web, 3 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 140*l.* 12*s.* 4*¼d.*; 1858, 100*l.* 7*s.* 0*½d.*; 1852, 451*l.* 19*s.* 4*¼d.*
44. See low station. No separate account kept for each.
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and September.
52. No.
53. One in lightroom. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

116.

CANTICKHEAD, HOY,
ORKNEY.

4. One light.
5. Previous to 1834.
6. Not known.
7. To open the anchorage of Longhope, and guide through the Pentland Firth.
8. 15th July 1858.
9. Messrs. Stevenson, engineers; A. Wilson, Granton, contractor.
10. Sea light.
11. Brick, coloured white; walls solid.
12. Yes; copper rod.
13. 73 feet.
14. 116 feet.
15. About 11 nautic miles.
16. About 17 nautic miles.
17. All round the compass.
18. Revolving; white.
19. Once every minute.
20. From going away of daylight to return.
21. Catadioptric Holophotal.
22. Second order.
23. None.
24. Sautter, Paris; Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Eleven days from 15 July.
29. 5,661*l.* 17*s.* 7*d.*
30. Finished.
31. Dimensions of lantern: diameter, 9½ feet; height, 6½ feet. For price, see Drawing, No. 15, General Return.
32. No.
33. Not lighted.
34. Not lighted.
35. 50*l.* principal, 40*l.* assistant. Allowance of 10*l.* each for land.
36. See Drawing, No. 6, General Return.
37. Not lighted.
38. Not lighted in 1857.
39. Colza. 1858, 3*s.* 4½*d.*
41. Nil.
42. Mercantile Marine Fund.
44. 1858, 221*l.* 3*s.* 8*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Commissioners, secretary, and superintendent.
51. April, June, and September.
52. No.
53. One in lightroom. Oil stored in tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

117.

PENTLAND SKERRIES,
PENTLAND FIRTH.

4. Two, 100 feet apart.
5. In 1793.
6. Shipowners of Liverpool.
7. To serve as a guide for passing through the Pentland Firth.
8. 1794.
9. Thomas Smith, first engineer; original builder not known. Tower rebuilt in 1833, from plans by Mr. R. Stevenson, and dwellings rebuilt by Mr. A. Stevenson in 1846. Scott and Brebner, contractors.
10. Sea lights.
11. Stone towers; natural colour; double walls.
12. No.
13. 118 feet and 88 feet.
14. 140 feet and 170 feet.
15. About 12 and 14 nautic miles.
16. About 18 and 20 nautic miles.
17. All round the compass.
18. Fixed, white.
20. From going away of daylight till its return.
21. Dioptric.
22. First class.
23. Originally catoptric, altered to dioptric in 1848.
24. Letourneau, Paris; Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Twenty-seven days.
29. Original cost not known.
30. Finished.
31. Dimensions of both lanterns, 12 feet diameter; 8 feet high. See Drawing, 15. For price, see General Return.
32. No.
33. None.
34. 3*l.*; done by the keepers.
35. Four; 60*l.*, 40*l.*, 40*l.*, and 40*l.*; ground allowed.
36. See Drawing, No. 8, General Return.
37. About 12*l.* annually.
38. 1637 and 1731 gallons; 1½ gross of each of the 4 sizes annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. About 42*s.* annually; cotton wick, circular web, 4 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 335*l.* 11*s.* 8½*d.*; 1858, 228*l.* 2*s.* 1*d.*; 1852, 1,206*l.* 10*s.* 8½*d.*
44. 1852, 771*l.* 19*s.* 11*d.*; 1858, 550*l.* 10*s.* 6*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every six months.
50. Secretary and superintendent.
51. April, June, and September.
52. No.
53. One in each lightroom. Oil in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. No code; flag hoisted for the attending boat.
57. Occasionally.

118.

NOSSEHEAD,
CAITHNESS.

4. One light.
5. 1842.
6. Landowner, Justice of Peace, &c. of Caithness.
7. To guide along the coast.
8. 1849.
9. Alan Stevenson, engineer; Robert Arnot, builder, Inverness, contractor.
10. Sea light.
11. Stone, natural colour; double walls.
12. Yes; copper rod.
13. 68 feet.
14. 175 feet.
15. About 14 nautic miles.
16. About 20 nautic miles.
17. From S.W. ½ W. to N.E. ¼ North, light, white; from N.E. ¼ N. to W.N.W. northerly, red.
18. Revolving. For colour see above.
19. Once every half minute.
20. From going away of daylight till its return.
21. Catadioptric.
22. First class.
23. None.
24. Letourneau, Paris; Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Twenty days.
29. 12,149*l.* 15*s.* 8*d.*
30. Finished.
31. Dimensions of lantern, diameter 12 feet; height, 10 feet. For price, see note to Drawing, No. 15, General Return.
32. No.
33. None.
35. Two; 50*l.* and 40*l.*; 5*l.* in supplement of ground.
36. See Drawing, No. 9, General Return.
37. About 3*l.* annually.
38. 783 and 784 gallons; ¾ gross of each of the 4 sizes annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. About 21*s.* annually; cotton wick, circular web, 4 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 345*l.* 5*s.* 10*d.*; 1858, 233*l.* 5*s.* 6*d.*; 1852, 1,249*l.* 8*s.* 0½*d.*
44. 1852, 408*l.* 13*s.* 6*d.*; 1858, 332*l.* 7*s.* 10*d.*
45. None. †
46. None.
47. None.
48. None.
49. Coastguard report every six months; favourable.
50. Commissioners, secretary, and superintendent.
51. April, June, and August.
52. No.
53. One in lightroom. Oil in a cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

119.

TARBETNESS,
MORAY FIRTH.

4. One light.
5. Named in Act 54 Geo. III.
6. Caledonian Canal Commissioners, June 1824.
7. A guide for Moray and Dornock Firths.
8. 1830.
9. R. Stevenson, engineer; James Smith, Inverness, contractor.
10. Sea light.
11. Stone, of natural colour, double walls.
12. Yes; copper rod.
13. 134 feet.
14. 175 feet.
15. About 14 nautic miles.
16. About 20 nautic miles.
17. From S.W. $\frac{1}{2}$ W. to W. $\frac{1}{2}$ N. easterly.
18. Intermittent, down the Moray Firth; fixed up the Firth.
19. Light, every 2 $\frac{1}{2}$ minutes.
20. From going away of daylight till return.
21. Catoptric.
22. First order.
23. None.
24. Clark, Edinburgh; and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Fifteen days.
29. 9,361*l.* 2*s.* 7*d.*
30. Finished.
31. Dimensions of lantern, diameter 11 $\frac{1}{2}$ feet, height 8 feet. See Drawing No. 15, General Return.
32. No.
33. 4*l.* 6*s.* 10*d.*; partly by contract.
34. 2*l.*; done by the keepers.
35. Two; 50*l.* and 40*l.*, with ground.
36. See Drawing No. 5, General Return.
37. About 8*l.* 4*s.* annually.
38. 838 and 841 gallons; 16 gross annually, 1 size.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. About 2*l.* 13*s.* 4*d.* annually. Cotton wick, circular web, 1 size.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 74*l.* 14*s.* 9 $\frac{1}{2}$ *d.*; 1858, 17*l.* 17*s.* 10*d.*; total, 1852, 282*l.* 9*s.* 9*d.*
44. 1852, 379*l.* 7*s.*; 1858, 335*l.* 14*s.* 8*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every six months; all favourable.
50. Commissioners, secretary and inspector.
51. April, June, and August.
52. No.
53. One in lightroom. Oil stored underground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

120.

CROMARTY,
CROMARTY BAY.

4. One.
5. 1834.
6. Report by engineer.
7. To open the harbour of refuge.
8. 1846.
9. Alan Stevenson, engineer; David Mitchell, Montrose, contractor.
10. Sea light.
11. Stone of natural colour; double walls.
12. Yes, copper rod.
13. 42 feet.
14. 50 feet.
15. About 8 nautic miles.
16. About 13 nautic miles.
17. From W.N.W. to S.E. by E. $\frac{1}{4}$ S., Northerly.
18. Fixed, red.
20. From going away of daylight to return.
21. Dioptric.
22. Fourth class; strengthened to seawards by three parabolic reflectors.
23. None.
24. Letourneau, Paris; Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Five days.
29. 3,203*l.* 9*s.*
30. Finished.
31. Dimensions of lantern: diameter, 7 $\frac{1}{2}$ feet; height, 6 feet. For price see note to Drawing, No. 15, General Return.
32. No.
33. 4*l.* 5*s.* 11*d.* by contract.
34. 2*l.*; done by the keepers.
35. Two; 50*l.* and 40*l.*; 10*l.* to each keeper in lieu of ground.
36. See Drawings, No. 8 and No. 2, General Return.
37. About 6*l.* 10*s.* annually.
38. 250 and 252 gallons. $\frac{3}{4}$ gross annually of each 2 sizes. 2 gross annually of 1 size.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.* 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. About 15*s.* annually. Cotton wick, circular web, 3 kinds.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 16*l.* 4*s.*; 1858, 14*l.* 3*s.* 10*d.*; total 1852, 55*l.* 5*s.* 6*d.*
44. 1852, 221*l.* 18*s.* 10*d.*; 1858, 236*l.* 14*s.* 2*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Secretary and superintendent.
51. April, June, and August.
52. No.
53. One in lightroom. Oil on ground floor.
54. Rain gauge, barometer, and thermometer.
55. No.
56. No; not required.
57. Occasionally.

121.

CHANONRY POINT,
ROSS-SHIRE.

4. One light.
5. 1834.
6. Report by engineer.
7. To open Inverness Firth.
8. 1846.
9. Alan Stevenson, engineer; David Mitchell, Montrose, contractor.
10. Sea light.
11. Stone of natural colour; double walls.
12. Yes, copper rod.
13. 42 feet.
14. 40 feet.
15. About 7 nautic miles.
16. About 12 nautic miles.
17. From W. $\frac{1}{2}$ N. to N. by E., Southerly.
18. Fixed white.
20. From going away of daylight till return.
21. Dioptric.
22. Fourth order.
23. None.
24. Letourneau, Paris; and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Nine days.
29. 3,571*l.* 17*s.* 2*d.*
30. Finished.
31. Dimensions of lantern: diameter, 7 $\frac{1}{2}$ feet; height, 6 feet. For price see Drawing, No. 15, General Return.
32. No.
33. 5*l.* 18*s.* 11*d.* by contract.
34. 2*l.*; done by the keepers.
35. Two; 50*l.* and 40*l.*; 1*l.* each for ground and garden.
36. See Drawing No. 8, General Return.
37. About 6*l.* annually.
38. 137 and 138 gallons. $\frac{3}{4}$ gross annually of wicks of each of the 2 sizes.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.* 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. About 8*s.* 3*d.* annually. Cotton wick, circular web, 2 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 28*l.* 10*s.*; 1858, 21*l.* 13*s.* 6*d.*; total 1852, 95*l.* 18*s.* 6*d.*
44. 1852, 207*l.* 11*s.* 9*d.*; 1858, 227*l.* 4*s.* 2*d.*
45. None.
46. None.
47. None.
48. None.
49. None.
50. Secretary and inspector.
51. April, June, and August.
52. No.
53. One in lightroom. Oil cellar on ground floor.
54. Rain gauge, barometer, and thermometer.
55. No.
56. No; not required.
57. Occasionally.

122.

COVESEA SKERRIES,
MORAYSHIRE.

4. One light.
5. 1834.
6. Towns on the shore of the Frith.
7. Guide for the Skerries Rocks.
8. 1846.
9. Alan Stevenson, engineer; James Smith, Inverness, contractor.
10. Sea light.
11. Stone of natural colour; walls double.
12. None.
13. 118 feet.
14. 160 feet.
15. 13½ nautic miles.
16. 19¼ nautic miles.
17. About 197° from W. by N. ¼ N. to S.E. by E. ¼ E. white, thence to S.E. ¼ S. red about 17°.
18. Revolving.
19. Once a minute.
20. Going away of daylight to return.
21. Dioptric system of Fresnel.
22. First order.
23. None.
24. Letourneau, Paris.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. Five days.
29. 11,514*l.* 16*s.*, including apparatus. Rent and feu, 30*l.* 2*s.*
30. Finished.
31. 1st class, *vide* Drawing, No. 15, General Return.
32. No.
33. 15*s.* 5*d.*
34. 2*l.*; done by the lightkeepers.
35. 50*l.* with 13*l.* each for ground; 40*l.* and garden.
36. *Vide* Drawing, No. 9, General Return.
37. 8*l.* 4*s.* annually.
38. 801 and 747 gallons. ¾ gross of each of the 4 sizes annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. About 21*s.* annually. Cotton wick, circular web, 4 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 74*l.* 14*s.* 9½*d.*; 1858, 18*l.* 7*s.* 7*d.*; total 1852, 282*l.* 9*s.* 9*d.*
44. 1852, 300*l.* 12*s.*; 1858, 366*l.* 8*s.*
45. None.
46. None.
47. None.
48. None.
49. Coast guard report every six months, favourably.
50. Superintendent.
51. April, June, and September.
52. No.
53. One in the lightroom. Oil in cellar at foot of the tower.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

123.

KINNAIRDHEAD,
ABERDEENSHIRE.

4. One light.
5. Named in the original statute, 1786.
6. Not known.
7. Turning point, Moray Frith.
8. 1787, improved in 1851.
9. Original engineer, Thomas Smith. The building was originally a castle, and it is not known by whom it was altered.
10. Sea light.
11. Originally built in the old castle. Dwellings rebuilt 1850. Natural colour of stone; double walls.
12. No.
13. 76 feet.
14. 120 feet.
15. About 12 nautic miles.
16. About 17 nautic miles.
17. From W.N.W. to S.S.E. ¾ E.; Northerly and easterly.
18. Fixed, white.
20. From going away of daylight to return.
21. Dioptric since 1851.
22. First order.
23. Altered from catoptric to dioptric in 1851.
24. Letourneau, Paris; and Milne, Edinburgh.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 32 days.
29. Original cost not known.
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price see, Drawing No. 15, General Return.
32. No.
33. 4*l.* 11*s.* 1*d.* by days wages.
34. 2*l.*; done by the keepers.
35. Two: 50*l.*, 40*l.*; 10*l.* to each in lieu of ground.
36. See Drawing, No. 8, General Return.
37. 8*l.* 4*s.* annually.
38. 797 and 800 gallons, ¾ gross of each of the 4 sizes annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. About 21*s.* annually; cotton, circular web, 4 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 400*l.* 1*s.* 6¾*d.*; 1858, 247*l.* 14*s.* 4*d.*; total 1852, 1,464*l.* 12*s.* 8½*d.*
44. 1852, 293*l.* 17*s.* 6*d.*; 1858, 307*l.* 19*s.* 2*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every six months; favourably.
50. Secretary and inspector.
51. April and July.
52. Was much impaired in efficiency, but not out on 14-15 October 1856. The assistant keeper fell asleep, and was dismissed.
53. One in the lightroom. The oil kept in a room of the old castle.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; not required.
57. Occasionally.

124.

BUCHANNESS,
ABERDEENSHIRE.

4. One light.
5. 1814.
6. Shipowners of Peterhead.
7. Guide to the coast.
8. 1827.
9. Robert Stevenson, engineer; John Gibb, contractor.
10. Sea light.
11. Stone; natural colour; walls double.
12. Yes, copper rod.
13. 115 feet.
14. 130 feet.
15. About 12 nautic miles.
16. About 18 nautic miles.
17. From N. by E. to S.W. by W. easterly.
18. Flashing white.
19. Five seconds.
20. From going away of daylight to return.
21. Catoptric.
22. First order.
23. None.
24. Neill & Co.; Clark and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 55 days.
29. 11,912*l.* 5*s.* 6*d.*
30. Finished.
31. Dimensions of lantern: diameter, 12 feet; height, 8 feet. For price, see Drawing 15, General Return.
32. Not purchased.
33. None.
34. 2*l.*; done by the keepers.
35. Two: 50*l.* and 40*l.*, with ground.
36. See Drawing, No. 3, General Return.
37. About 8*l.* annually.
38. 833 and 837 gallons; 18 gross of wicks annually.
39. Colza. 1857, 4*s.* 1½*d.*; 1858, 3*s.* 4½*d.*
40. About 3*l.* annually; cotton wicks, circular web, 1 size.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 444*l.* 19*s.* 2½*d.*; 1858, 340*l.* 14*s.* 4*d.*; 1852, 1,701*l.* 13*s.* 8*d.*
44. 1852, 309*l.* 16*s.* 8*d.*; 1858, 297*l.* 14*s.* 5*d.*
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every six months.
50. Secretary and superintendent.
51. April, June, and August.
52. No.
53. Two spare lamps. Oil stored in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; no use.
57. Occasionally.

COMMISSIONERS OF NORTHERN LIGHTHOUSES.

125.

GIRDLENESS, ABERDEEN.

4. Two fixed lights, one 70 feet above the other.
5. 1814.
6. Shipowners of Aberdeen.
7. Guide for coasting vessels.
8. 1833.
9. R. Stevenson, engineer; John Gibb, contractor.
10. Sea light.
11. Stone, double walls.
12. Yes; copper rod.
13. 120 feet.
14. 185 and 115 feet.
15. About 14 and 11 nautic miles respectively.]
16. About 20 and 17 nautic miles respectively.
17. From N.N.E. to W.S.W. $\frac{1}{2}$ W., easterly and southerly.
18. Fixed white.
20. Going away of daylight.
21. Upper light, dioptric; lower light, catoptric.
22. Dioptric, 1st order; catoptric.
23. Upper light altered to dioptric in the year 1847.
24. Letourneau, Paris; Milne, Edinburgh; and others.
25. Smoke tubes and air apertures.
26. None.
27. None.
28. 23 days.
29. 12,940l. 5s. 1d.
30. Finished.
31. Dimensions of lanterns: high light, diameter, 11 feet; height, 7 feet: low light, diameter, 23 $\frac{1}{2}$ feet; height, 7 feet. For price, see Drawing, No. 15, General Return.
32. No.
33. None.
34. 3l.; done by the lightkeepers.
35. Three: principal, 50l.; 1st assistant, 40l.; 2d assistant, 40l.: 24l. in aid of ground. See Drawing, No. 14, General Return.
37. About 10l. annually.
38. 1,302 and 1,322 gallons; $\frac{3}{4}$ gross of each of the four sizes annually; 10 gross of one size.
39. Colza. 1857, 4s. 1 $\frac{1}{2}$ d.; 1858, 3s. 4 $\frac{1}{4}$ d.
40. About 2l. 14s. annually; cotton wicks, circular web.
41. None.
42. Mercantile Marine Fund.
43. 1852, 530l. 8s. 3 $\frac{3}{4}$ d.; 1858, 359l. 4s. 6d.; 1852, 2,032l. 15s. 10d.
44. 1852, 538l. 17s. 5d.; 1858, 512l. 4s. 1d.
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every six months; favourable.
50. Commissioners, secretary, and superintendent.
51. April, June, July, August.
52. In November 1858 the light was extinguished for a few minutes by a lightkeeper, while being educated, going to sleep. He was dismissed.
53. One spare lamp in upper lightroom; oil in cellar under ground.
54. Rain gauge, barometer, and thermometer.
55. No.
56. No.
57. Occasionally.

126.

BELL ROCK, OFF FORFARSHIRE.

4. One light.
5. In 1793 Admiral Sir A. Cochrane called attention, but a special Act of Parliament was obtained in 1806, under which the lighthouse was erected.
7. To point out the position of the rock.
8. 1811.
9. Robert Stevenson, Engineer, under whose immediate superintendance the lighthouse was erected.
10. Sea light.
11. Stone, solid; painted every three years.
12. Yes; copper rod.
13. 117 feet.
14. 90 feet.
15. About 10 nautic miles.
16. About 16 nautic miles.
17. All round the compass.
18. Revolving alternate red and white.
19. Every two minutes.
20. From going away of daylight to return.
21. Catoptric.
22. First order.
23. None.
24. Clark, Edinburgh; Soho Works, Birmingham; Dove, Edinburgh.
25. Smoke tubes and air apertures.
26. A bell tolled outside the tower.
28. Twenty-four.
29. 61,331l. 9s. 2d.
30. Finished.
31. Dimensions of lantern: diameter, 11 $\frac{1}{2}$ feet; height, 8 feet. For price, see note to Drawing, No. 15, General Return.
32. No.
33. 17l. 11s. 5d., mostly by days' wage.
34. Every third year 8l. cost annually, not by contract.
35. Principal, 68l.; 1st assistant, 62l. 15s.; 2d assistant, 55l. 8s.; 3d assistant, 55l. 8s. Rations on the rock, and 4l. each for garden.
36. See note to Drawing, No. 4, General Return.
37. About 9l. 10s. annually.
38. 611 and 647 gallons, 12 gross cotton wicks, annually, circular web, 1 size.
39. Colza. 1857, 4s. 1 $\frac{1}{2}$ d.; 1858, 3s. 4 $\frac{1}{4}$ d.
40. 2l. annually; cotton wick, circular web, 1 size.
41. Not known.
42. Mercantile Marine Fund. Payment to Paymaster General.
43. 1852, 1,370l. 16s. 1d.; 1858, 927l. 7s. 11d.; 1852, 5,134l. 16s. 7 $\frac{1}{2}$ d.
44. 1852, 759l. 12s. 9d.; 1858, 728l. 6s. 3d.
45. None.
46. None.
47. None.
48. None.
49. Coastguard report every six months; favourable.
50. Commissioners, secretary, and inspector.
51. June, July, and August, annually.
52. No.
53. One spare lamp. Oil stored in under part of tower.
54. Rain gauge, barometer, and thermometer.
55. No.
56. A ball hoisted on a flagstaff at 10 o'clock, if all well.
57. Every six weeks; three on the rock, one ashore.

127.

ISLE OF MAY, FRITH OF FORTH.

4. One light for general navigation; but a small leading light 750 feet distant, N.N.E. $\frac{1}{4}$ E. leads half a mile eastward of the N. Carr Rock.
5. 1810-11; but it was previously from 1635 a light from coal fire.
6. Lord Melville, First Lord of the Admiralty, in consequence of the loss of two frigates, proposed the transfer of the lights to the Commissioners.
7. Guide to the Frith of Forth.
8. 1816.
9. Robert Stevenson, engineer.
10. Sea light.
11. Stone; solid; natural colour.
12. Yes, copper rod.
13. 78 feet, leading light 36 feet.
14. 240 feet, leading light 110 feet.
15. About 16 and 11 nautic miles respectively.
16. About 23 and 17 nautic miles respectively.
17. All round the compass.
18. Fixed, white.
20. Going away of daylight till its return.
21. Catadioptric. This was the first fixed dioptric light adopted by the Commissioners, and the apparatus is of an experimental nature, and was intended to have been replaced by a new apparatus.
22. First order.
23. None.
24. Cookson, Newcastle.
25. Smoke tubes and air apertures.
26. None.
28. 21 days.
29. Not known.
30. Finished.
31. Lantern of high light: diameter, 11 $\frac{1}{2}$ feet; height, 7 feet. Lantern of low light: diameter, 6 $\frac{1}{2}$ feet; height, 5 $\frac{1}{2}$ feet. For price, see note to Drawing, No. 13, General Return.
32. The island and right to levy the dues, was purchased for 60,000*l.*
33. 14*l.* 10*s.* 2*d.*, partly by contract.
34. About 2*l.*; done by the lightkeepers.
35. Three: principal, 55*l.*; assistant, 40*l.*; ditto, 40*l.*
36. Not known. See query No. 21.
37. About 8*l.* 10*s.* annually.
38. 873 and 839 gallons annually. $\frac{3}{4}$ of a gross of wicks 4 sizes.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. Wicks, average 21*s.*, circular web, 4 sizes.
41. Nil.
42. Mercantile Marine Fund; payment to Paymaster General.
43. 1852, 838*l.* 2*s.* 3*d.*; 1858, 498*l.* 6*s.*; total 1852, 3,148*l.* 2*s.* 10 $\frac{1}{2}$ *d.*
44. 1852, 458*l.* 8*s.*; 1858, 458*l.* 17*s.* 9*d.*
45. None.
46. None.
47. None.
48. None.
49. Report every half year by the officers of coastguard; always favourable.
50. Deputation of Commissioners, secretary, and superintendent.
51. April, June, July, and August.
52. No.
53. One spare lamp in lighthouse. Oil in cellar underground.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None.
57. Occasionally.

128.

INCHKEITH, FRITH OF FORTH.

4. One light.
5. 1801-2.
6. Trinity House of Leith.
7. To open Frith of Forth, and being in a central position.
8. 1804.
9. Engineer, Thomas Smith.
10. Sea light.
11. Stone; natural colour.
12. Yes, rod of copper.
13. 58 feet.
14. 220 feet.
15. About 16 nautic miles.
16. About 22 nautic miles.
17. All round the compass.
18. Originally stationary, but now revolving white.
19. Once every minute.
20. Going away of daylight to return.
21. Catadioptric. This was the first lens revolving light adopted by the Commissioners, and several experiments were from time to time made on it.
22. Second order.
23. None.
24. Cookson, Newcastle; Milne, Edinburgh.
25. Smoke tube and air apertures.
26. None.
27. None.
28. Twenty-one.
29. Not known.
30. Finished.
31. Dimensions of lantern: diameter, 10 feet; height, 5 $\frac{1}{2}$ feet. For price, see note to Drawing, No. 15, General Return.*
32. No.
33. 4*s.* 9*d.*
34. About 2*l.*; done by the lightkeeper.
35. 50*l.* principal, 40*l.* assistant. Ground of the island.
36. Not known, see query 21.
37. 8*l.* annually.
38. 1857, 368 $\frac{1}{2}$ *l.*; 1858, 550 $\frac{1}{2}$ *l.* $\frac{3}{4}$ gross of each of 3 sizes annually.
39. Colza. 1857, 4*s.* 1 $\frac{1}{2}$ *d.*; 1858, 3*s.* 4 $\frac{1}{2}$ *d.*
40. About 13*s.* 10*d.* annually. Cotton wick, circular web, 3 sizes.
41. Nil.
42. Mercantile Marine Fund.
43. 1852, 485*l.* 2*s.* 1 $\frac{1}{2}$ *d.*; 1858, 312*l.* 17*s.* 10*d.*; total 1852, 17,291*l.* 19*s.* 4 $\frac{1}{2}$ *d.*
44. 322*l.* 3*s.* and 324*l.* 12*s.* 1*d.*
45. None.
46. None.
47. None.
48. None.
49. Coast guard makes a half-yearly report. No complaints.
50. By superintendent and secretary.
51. April, June, and August.
52. No.
53. One in the lightroom. Oil stored in a sunk cellar.
54. Rain gauge, barometer, and thermometer.
55. None.
56. None; but pilots occasionally visit the island, and would bring any word.
57. Occasionally.

CIRCULAR No. V.—BUOYS AND BEACONS.

I. to XII.

- I. THE COMMISSIONERS OF NORTHERN LIGHTHOUSES,
 II. FURNISHED. No. 1.
 III. NOT RESPONSIBLE TO ANY OTHER AUTHORITY FOR
 MANAGEMENT, BUT REFER TO BOARD OF
 TRADE AND TRINITY HOUSE FOR AUTHORITY
 TO PLACE.
 IV. NO PARTY CAN PLACE A BUOY WITHOUT SANCTION
 OF THE COMMISSIONERS.

Names of Authorities, so far as known, responsible to the
 Commissioners of Northern Lighthouses for their
 management.

Ayr Harbour Light.	Leith Pier.
Arbroath.	Lossiemouth Pier.
Aberdeen.	Montrose.
Ardrossan.	Macduff.
Burntisland.	North Queensferry.
Banff.	Newhaven.
Buckhaven.	North Berwick.
Buckie.	Port Ellen.
Clyde Lights.	Peterhead.
Campbeltown.	Port Glasgow.
Crinan Sea Lock.	Pettycur.
Dundee.	Pittenweem.
Dundee Ferry.	Portgordon.
Dundee Harbour.	Queensferry, North.
Dumfries.	Salcoats.
Fisherrow.	Stonehaven.
Frazerburgh.	Stornoway.
Granton Pier.	St. Margaret's Hope.
Greenock.	St. Andrews.
Grangemouth.	St. Davids.
Kirkaldy.	Tay.
Kirkwall.	Troon.
Leith.	Wick.

- V. BUOYS ARE NOT CLASSIFIED EXCEPT AS TO SIZE; A
 LIST IS GIVEN SEPARATELY. (See pages 190,
 191, *over leaf*.)
 VI. THE COMMISSIONERS USE THE CAN BUOY GENER-
 RALLY IN ALL POSITIONS.
 VII. NO. THEY ARE GENERALLY INSPECTED BY A
 BUOY MASTER, AND IF REPAIR IS REQUIRED,
 THEY ARE TAKEN AWAY AND ANOTHER SUB-
 STITUTED.
 VIII. ALL UNDER THE CHARGE OF ONE BUOY MASTER,
 WHO MAKES AN ANNUAL SURVEY.
 IX. BEACONS ARE NOT CLASSIFIED.
 X. SEE SEPARATE LIST, page 192.
 XI. NONE BEING SUBSTITUTED, BUT THE COM-
 MISSIONERS HAVE HAD VARIOUS SUGGESTIONS
 BEFORE THEM.
 XII. YES. See below, THE SYSTEM.

REPORT by the SECRETARY to the COMMISSIONERS of
 NORTHERN LIGHTHOUSES on the proposed establish-
 ment of a uniform Code of Buoy and Tide Signals.

In submitting to the Commissioners a proposal for the
 establishment of a uniform Code of Buoys, the reporter
 in the outset disclaims all pretence at originality of concep-
 tion; that and the suggestion of the system is due to
 Captain Bedford, R.N., Admiralty Surveyor, Oban, who
 brought it under the notice of the reporter.

All that the reporter has done—and even in this he has
 been much aided by Captain Bedford—is to carry out the
 system so as to make it generally applicable to all localities,
 and at the same time to keep it so simple in its nature as
 to render its misapprehension by mariners almost impos-
 sible.

Neither Captain Bedford nor the reporter were aware
 that the system had been adopted in France, and it is only
 since the arrangement now to be reported on was devised
 that the reporter has seen the French system. Captain
 Bedford, so far as known, has not yet seen it. The coinci-
 dences of the French system will be noticed in the progress
 of the Report.

§ 1.—BUOYS.

1. To mark the boundary of a main channel it is pro-
 posed that, on sailing inwards all buoys on the starboard
 hand should be coloured *red*, all buoys on the port hand
 coloured *black*. This arrangement is coincident with that
 found to be adopted by the French.

2. To indicate the turning point *seaward* it is proposed
 that the most seaward red and black buoy respectively
 should have in addition a mast and ball of corresponding

XII. (System.)

colour. This is indicated in France by a *white* buoy, but
 with the view of avoiding as much as possible the multipli-
 cation of colours, and keeping up simplicity, the mast and
 ball seem to be the preferable indication.

3. To indicate a small centre danger in the main channel,
 buoyed as above, it is proposed to place upon such danger
 a buoy chequered black and red, thus combining the two
 bounding colours to indicate pass either side. The French
 propose to indicate this by black and red *belts*. Either
 sign understood would be sufficient, but the reporter has
 reserved belted buoys for another purpose.

4. If the centre danger be of some size, and lies *across*
 the main channel, it is proposed to mark this by red and
 white chequered buoy at the port end, and by black and
 white chequered buoy at the starboard end; thus still pre-
 serving the distinctive colours. The French system does
 not provide for this.

5. If the danger extend *up and down* the main channel,
 it is proposed to mark this with buoys in red and white
 vertical stripes at the upper end, and black and white ver-
 tical stripes at the lower end. The French system does
 not provide for this. If the danger be large enough to
 call for it, Nos. 4 and 5 may be repeated in their respective
 localities.

One particular and very great advantage attending the
 adoption of a uniform system of buoyage is, that it does
 not signify how often the buoys are repeated. Thus, in a
 main channel the red and black buoys, like a chain of
 sentries, might with advantage, and without the slightest
 possible risk of confusion, be repeated every half mile, or
 even at shorter intervals; the same with the centre dangers.
 It is apprehended, therefore, that the five distinctions now
 given would enable the most intricate navigation to be
 buoyed with perfect accuracy, and that any mariner could
 pass through them with complete security.

At present, no doubt, where there are numerous or at
 least a choice of channels, it is of vast importance to the
 mariner to know which channel he is navigating, *because*
the buoys vary in the various channels; but if the uniform
 system be once adopted, this knowledge is of minor impor-
 tance, for whatever channel he is in, he is safe so long as he
 attends to the two bounding colours. He would also be
 at no loss to know what all the differently coloured buoys
 pointed out.

But this consideration has not induced the reporter to
 overlook the benefit of marking different channels, because
 there may be a variety of depths of water in different
 channels. Where they are at present indicated by lights,
 as at the entrance of the Thames, or by bell buoys or other
 distinctive marks, he would not propose to interfere with
 them. When buoys, however, are used, the reporter
 proposes.—

6. To indicate fairways, buoys coloured in belts, with the
 word "Fairway" in conspicuous letters, with the addition,
 if thought necessary, of the name of the channel. Thus,
 still keeping up the distinctive colouring—

1. Black and white belts would indicate port fairway.
2. Black and red belts centre fairway.
3. Red and white belts starboard fairway.

There are many additional distinctions which could be
 adopted for fairways.

The French in their system number the boundary buoys,
 equal numbers being affixed on red buoys, and unequal
 numbers on black buoys. Although it is easy to imagine
 cases in which numbers might prove useful, yet to make it
 an imperative portion of the system appears to the reporter
 to be too minute and intricate, divesting the system of that
 simplicity which it is so desirable to maintain. There can
 be no doubt of its applicability in many localities, and
 therefore it should not be prohibited. If it served no
 other purpose, it would more readily lead to the identifi-
 cation of buoys breaking adrift.

The reporter has considered the propriety of adopting
 some different and equally distinctive system for marking
 what may be termed *along-shore dangers* in contradistin-
 ction to the entrance or departure from harbours, bays,
 creeks, rivers, &c. &c. In this view he could have pro-
 posed distinctive colours to indicate the cardinal points of
 the compass; but on full consideration he has abandoned
 this as tending to perplex.

SCOTLAND.
 Circular V.
 Question XII.

BUOYS AND BEACONS.—REPLY TO V.

SCOTLAND.
Circular V,
Question V.

No.	Name of Station.	District.	Shown on Chart, Sheet, No.	Mate- rial.	Cost.	Annual Cost of Repair.	Annual Cost of Paint- ing.	Total No. in Posi- tion.	Total No. in Re- serve.	Wher- ever No. in any other Posi- tion, and No. at each Place.	No. kept complete, and No. at Spare Mountings.	No. accidentally displaced, in 1885.	Causes assigned.	Method of Mooring.	Cost of Mooring in Fathoms Water.	Whether Buoys are procured and re- paired by Tender.	Means to identify Buoy by Night, &c.	No. in Position to which Special Measures applied.	Colour.	Size in Feet.	Form.	Weight of Sinkers in Cwt.	Length of Chain in Fms.	Size of Chain in Inches.
1	Middle Bank, West End - East End -	Frith of Forth -	3	Wood				1	1										Black.	6	Can.	10 0 0	7½	1
2	" " "	" "	"	"				1	1										"	6	"	7 2 0	8½	1
3	Inchbrako Rock	" "	"	"				1	1										B. & W. chequered	6	"	10 0 0	9	1
4	Long Annet Point	" "	"	"				1	1										Red.	6	"	10 0 0	10½	1
5	Hlen and Chickens	" "	"	"				1	1										"	6	"	10 0 0	10	1
6	Dolla Bank	" "	"	"				1	1										Black.	7	"	16 1 0	9	1½
7	Druin Sands, West	" "	"	Iron				1	1										"	8	"	16 0 0	12	1½
8	" " East	" "	"	"				1	1										"	8	"	16 0 0	10	1½
9	West Gunnat	" "	"	Wood				1	1										R. & W. chequered	8	"	16 0 0	13½	1½
10	East	" "	"	"				1	1										"	8	"	16 0 0	12	1½
11	Pallas Rock	" "	"	"				1	1										"	7	"	10 0 0	13	1
12	Hewit Rock	" "	"	"				1	1										Striped B. & W. horizontal.	8	"	16 0 0	15	1½
13	Crug Waugh Rock	" "	"	"				1	1										Red.	8	"	16 0 0	12	1½
14	North Craig Rock	" "	"	Iron				1	1										Black.	8	"	16 0 0	12	1½
15	Sand End	" "	"	Wood				1	1										R. & W. chequered	7	Conical.	13 3 18	11½	1
16	Long Craig	" "	"	"				Nil.	Nil.										Black.	6	Can.	10 0 0	9	1
17	West Rock Head	" "	"	"				1	1										Red.	6	"	10 0 0	10	1
18	East	" "	"	"				1	1										"	7	"	22 2 0	14	1½
19	Thill Rock	" "	"	"				1	1										Black.	6	"	7 0 0	9	1
20	Meikloona Bank	Moray Firth	4	"				1	1										Red.	6	"	7 0 0	9	1
21	Middle Bank, East	" "	"	"				1	1										Black.	6	"	7 0 0	9	1
22	Petty Bank	" "	"	"				1	1										R. & W. chequered	6	"	7 0 0	9	1
23	Munlochy Shoal	" "	"	"				1	1										Red.	6	"	10 0 0	9	1
24	Slate Bank	" "	"	"				1	1										Black.	6	"	10 0 0	9	1
25	Craigence, or Fort George	" "	"	"				1	1										"	0	"	10 0 0	12	1
26	Riff Bank, West End	" "	"	"				1	1										"	12	"	10 0 0	11	1½
27	" " Middle	" "	"	"				1	1										"	21	Nun.	20 0 0	13	1½
28	" " East End	" "	"	"				1	1										Red.	6	Can.	10 0 0	0	1
29	Whiteness Sand Head	" "	"	"				1	1										"	6	"	7 0 0	0	1
30	Navig Bank	Cromarty Firth	"	"				1	1										"	6	"	7 0 0	9	1
31	Niper Sands, East	" "	"	"				1	1										"	6	"	7 0 0	9	1
32	" " West	" "	"	"				1	1										"	6	"	7 0 0	9	1
33	Newhall Bank	" "	"	"				1	1										"	6	"	16 0 0	14	1½
34	Three Kings Rocks	Moray Firth	"	"				1	1										"	8	"	16 0 0	14	1½
35	Culloden Rock	" "	"	"				1	1										"	8	"	22 0 0	18	1½
36	Fairway off Train Bar	" "	"	"				1	1										"	12	Nun.	18 0 0	10	1
37	Tain Bar, North side	Bornoch Firth	"	"				1	1										Red.	6	Can.	10 0 0	0	1
38	" " South side	" "	"	"				1	1										"	6	"	7 0 0	9	1
39	Crookness Shoal	" "	"	"				1	1										"	6	"	10 0 0	10	1
40	Grinds	Orkney	5	"				1	1										"	6	Can.	10 0 0	12	1
41	Vedder's Skerries	" "	"	"				1	1										"	7	"	10 0 0	10	1
42	" "	" "	"	"				1	1										"	8	"	15 0 0	13	1½
43	Bar Rock	" "	"	"				1	1										Red.	7	"	10 0 0	10	1
44	" "	" "	"	"				1	1										Black.	6	"	10 0 0	14	1½
45	" "	" "	"	"				1	1										B. & W. chequered	7	"	10 0 0	14	1½
46	" "	" "	"	"				1	1										Black.	6	"	10 0 0	10	1

No special means beyond its appearance.

No; they are repaired by the Buoy Master.

About 15l. 15s.

Chains and Sinkers.

Stress of Weather.

Two

Total at Leith, 28.

Total at Cromarty, 15.

Average for each Buoy, 7s. 6d.

For each Buoy, average 1l. 5s. 6d.; or total, 102l. 1s. 6d.

From 16l. 16s. to 31l. 10s., according to size.

BUOYS AND BEACONS.—REPLY TO V.

SCOTLAND.
Circular V.
Question V.

No.	Name	Material	Height	Light	Colour	Number of Lights	Number of Buys	Number of Beacons	Number of Sunkers	Number of Chains	Number of Stresses	Number of Repairs	Number of Buys	Number of Beacons	Number of Sunkers	Number of Chains	Number of Stresses	Number of Repairs	Number of Buys	Number of Beacons	Number of Sunkers	Number of Chains	Number of Stresses	Number of Repairs
45	Scarvan	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
46	Lonskerry	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
47	Broad Ebb	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48	Otterwick Bay	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
49	North Shoal, Lerwick	Iron	"	"	"	"	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.	Nil.
50	Lothbar Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
51	N. Entrance, Batta Sound	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
52	Skerrioe Rock	Wood	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
53	McMillan's Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
54	Gulnare Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
55	Bow Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
56	String Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
57	Boaskdale Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
58	New Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
59	Captain McKillop's Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
60	Yule Rock	Iron	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
61	Culchovna Spite	Wood	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
62	Llunthe Loch	"	"	"	"	"	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
63	Chavouin Spite	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
64	Corran Flat	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
65	Corran Bank, South End	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
66	Corran Bank, North End	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
67	Lochy Flat, East	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
68	" West	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
69	" Middle	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
70	Maclean's Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
71	New Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
72	Applin Point	"	"	"	"	"	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
73	Corran Shoal	"	"	"	"	"	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
74	Skerat Rock, N.E. End	"	"	"	"	"	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
75	" S.W. End	"	"	"	"	"	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
76	Middle Bank	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
77	Ferry Rock	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
78	Boho (or Bogha Nuadh) Rock	"	"	"	"	"	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11	11
79	Essdale Harbour, N.E. End	"	"	"	"	"	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
80	Essdale Harbour	"	"	"	"	"	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13	13
81	Sierna Scallig	"	"	"	"	"	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
82	Ardnamont Point	"	"	"	"	"	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
83	Beer Rock	"	"	"	"	"	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
84	Gricke Rock	"	"	"	"	"	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10
85	Wood Farm Rock	"	"	"	"	"	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
86	Millbeg Bank	"	"	"	"	"	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14	14
87	Campbeltown Outer Buoy	Loch.	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
88	Fullarton Rock, Lamnash	"	"	"	"	"	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
89	Arranmas Borrals	"	"	"	"	"	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
90	Patterson's Rock	"	"	"	"	"	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
91	Maclesh Rock	"	"	"	"	"	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15
92	Loch Ryan, Outer	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
93	Spite of Bear Point	"	"	"	"	"	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

APPENDIX—BUOYS AND BEACONS:
BUOYS AND BEACONS.—REPLY TO X.

SCOTLAND.
Circular V.
Question X.

Number.	a.	District.	Shown on Chart Sheet No.	b.	c.	d.	e.	f.	g.	h.	i.	j.	k.	
	Name of Beacon.			Date of Erection.	Purpose for which each was erected.	Means of identifying it.	Material used.	Colour.	If lighted by Night, the Means.	Height of Beacon.	First Cost of Erection.	Cost of Maintenance in 1852 and 1858.	Income in 1852 and 1858.	
1	Beamer	Firth of Forth	3	1844	To point out the position of the several dangers after which the Beacons are designated.	Tower with spherical ball on top	Stone	Black	None, except Arnish, which is illuminated at night by light thrown upon it from Stornoway Lighthouse.	50	£ 473 12 6		NIL	
2	Oxen	"	"	"		Do. with cone on top	Iron	Red		12	35	851 16 5		
3	East Vows Rock	"	"	1847		Pyramid of cast iron pillars with cylindrical open cage on top.	"	"		29	40	688 19 6		
4	South Carr	"	"	1844		Tower with cross on top.	Stone	"		34	35	860 10 2		
5	North Carr	"	"	1821		Stone base surmounted by cast iron frame with ball.	Iron	Black		34	30	604 16 8		
6	Cairnbigg Briggs	Moray Firth	2	1858		Pyramid of cast iron pillars with cylindrical open cage on top.	"	Red		27	27	738 15 0		
7	Covessa Skerries	"	4	1845		Do.	"	"		40		*636 0 1		
8	Longman Point	Inverness Firth	"	1848		Cone of cast iron plates with do.	"	Black		30	40	428 3 4		
9	Strona	Orkney	5	1857		Pyramid of iron pillars with do.	"	Red		40	40	1,246 13 9		
10	Nevaholm	"	"	1848		Cone of cast iron plates with cornice on top.	"	Black		32	32	359 7 2		
11	Barrel of Butter	"	"	1852		Tower	Stone	White		15		207 5 3		
12	Glimsholm	"	"	1848		Pyramid of iron pillars with cage on top.	Iron	Red		40		774 10 11		
13	Vasa	"	"	1838		Malleable iron frame with cage on top.	"	"		18		139 2 7		
14	Arnish	Minsh	2	1853		Cone of cast iron plates surmounted with lantern containing glass prism. Pyramid of iron pillars with cage on top.	"	"		32		684 17 1		
15	Loch Inver	"	7	1857		Do. do.	"	"		36		749 6 11		
16	Skerriatic	"	2	1849		Do. do.	"	"		40		1,010 15 5		
17	Skerranale	"	"	"		Do. do.	"	"		40		1,010 15 6		
18	Phobla	Sound of Slaye	"	1858		Malleable iron frame with cage on top.	"	"		38		563 18 2		
19	Calliach Stone	"	"	1857		Do. with barred on top	"	"		22		169 7 7		
19 a	Beander Rock	Linnhe Loch	"	1859	Do. with cage on top	"	"	18		In course of erection.				
20	Easdale { 1 } { 2 } { 3 }	Easdale } Harbour. } Sound of Jura	12	1858	Cast iron pillar with ball on top	"	"	12		130 6 0				
21			2	"	Do. do.	"	"	12		12				
22			3	"	"	Do. do.	"	"	12		12			
23	Skervuil	Sound of Jura	1	1839	Tower	Stone	White	29		439 9 7				
24	Small Isles	"	"	1853	Cast iron pillar with ball on top	Iron	Black	18		71 13 7				
25	Outer Bank	Loch Fyne	13	1848	Cone of cast iron plates with ball on top.	"	"	34		593 11 3				
26	West Outer Bank	"	"	"	Do. do.	"	"	34		593 11 3				
27	Millmore	Campbeltown	14	"	Do. do.	"	"	25		502 8 0				
28	Trench, Shoal	"	"	"	Do. do.	"	"	25		502 8 0				
29	Sanna Harbour	"	15	1853	Cast iron pillar with ball on top.	"	"	12		821 1 9				
30	Laprock Rock	Clyde	"	1843	Tower with ball	Stone	"	39		733 13 5				
31	Beest Rock	"	"	1844	Pyramid of cast iron pillars with cage on top.	Iron	"	40		972 0 1				
32	Laggan Rock	"	1	1846	Do. do.	"	"	40		Account not closed.				
33	Tusdale Rock	Caif of Man	16	1859	Malleable iron frame with cage on top.	"	"	33		Just completed.				

* No Inspector's time charged for this, as he was at the lighthouse.

XII. (System.)

BUOYS AND BEACONS.

XII. (System.)

SCOTLAND.
Circular V.
Question
XII.

This last observation would apply to such a district as Yarmouth Sands, which may be called "an along-shore" danger; but he found it on consideration to be a much more simple course to fix whether Yarmouth Sands should be treated as the entrance to Yarmouth or the highway to London, and in either case to buoy it accordingly on the rules before given. On either supposition there would be no difficulty in carrying out the system in its integrity and rendering that intricate navigation more intelligible and secure than it is at present.

The reporter has the satisfaction of knowing that all practical seamen who have looked into the proposed system are satisfied of its advantages and of its applicability in all localities. One suggestion emanates from the French which is worthy of being noted, if not of being carried into practice, and that is where small rocks at the entrance to a port or bay come above the level of the sea, whether they should not be coloured on the same principle as the buoys.

§ 2.—BEACONS.

There can be no doubt that if the uniform colouring could be applied to beacons as well as buoys, it would prove exceedingly useful; but while in narrow channels the colouring could be adopted with great advantage, there are considerations which lead to considerable difficulty in its uniform and universal application; and if this last cannot be attained perhaps it would be better to leave dangers alone. In the majority of cases beacons mark dangers extending from the shore, and warn the mariner to keep off, so that with this knowledge *visibility* becomes of primary consequence, and some colours adopted in the particular positions of beacons would tend to impair this visibility. At all events the reporter has not been able to present a matured plan on this branch which he could at present with confidence recommend.

§ 3. TIDE SIGNALS.

The reporter has devised a system of signals to indicate the rise and fall of tides, with the depth of water, which is capable of being used at every harbour in the world day and night.

The chief instrument is a flagstaff at the entrance of the harbour.

A red ball *by day* at the masthead indicates the tide rising.

A green ball—the tide falling.

The depth of water is indicated in feet by the exhibition of white balls in varied positions, as specified in detail in a code given in the Appendix, No. 11.

The same signals are intended to be displayed by night with lamps instead of balls.

Danger—No signals by day or night.

Since the above system was devised the reporter has discovered that the French have a somewhat analogous system in operation. They indicate the rise and fall by *flags*, and depth by *black* balls, in varied positions. The reporter has no hesitation in rejecting this system. Flags are at best an uncertain signal, except when the wind blows across the direction of observation. Black has also been rejected, as it is not a colour available at night. For the sake of simplicity, it has been considered best to keep the colours for day and night signals alike.

The system has been rendered as simple as practicable. In the majority of cases a couple of white balls and two white lights will answer the whole purpose, while the indicating tidal colours at the masthead might be given by a *reversible disc* by day and *one reversible lamp* by night, as in railway signals.

There is another great advantage which would attend this system, that vessels in the offing could just as easily telegraph their draught of water as the depth could be signalled from the shore.

In an Appendix are given, in a tabular form, two codes, one for buoys and the other for tide signals. If the systems be ever adopted, these tables would form complete manuals in the hands of a mariner, which he could never mistake. Indeed, they are quite adapted for printing on most charts.

Submitted by

(Signed) ALEX. CUNINGHAM,

Edinburgh May 1858.

Secy.

APPENDIX No. 1.

Proposed CODE of UNIFORMITY in the Colour of Buoys for all Nations.

	Colour.	Purpose Served.	Sailing Direction in Entering.	Remarks.
1	Red - -	Bounding main chain l.	Keep on Starboard hand.	—
2	Black - -	Do. do.	Keep on Port hand.	—
3	Black and Red chequered.	To mark small centre danger.	Pass on either hand.	—
4	Red and White chequered.	Bounding Port end of centre danger across main channel.	On Starboard hand.	Never pass between No. 4 and 5.
5	Black and White chequered.	Bounding Starboard end of do.	On Port hand	—
6	Red and White vertical stripes.	Bounding Upper end of centre danger up and down channel.	On either hand	Never pass between No. 6 and 7.
7	Black and White vertical stripes.	Bounding Lower end of do.	On either hand	—
8	Black or Red mast ball.	An Elbow or Turnupoint in channel.	Pass according to colour as No. 1 and 2.	—
9	In Belts with the word "Fairway" in bold letters.	Fairways	On either hand	1. Black and White Port Fairway. 2. Black and Red centre do. 3. Red and White Starboard do.
10	Green - -	Wreck.	—	—

APPENDIX No. 2.

Proposed CODE of UNIFORM SIGNALS for all Harbours.

Flagstaff and Balls—By Day.

Tide Flowing—Red Ball at masthead.

Tide Ebbing—Green Ball at masthead.

Depth of Water indicated, both Rise and Fall.

- 10 Feet—White Ball, half mast.
- 12½ Feet—Do. do. full height.
- 15 Feet—Second White Ball, half mast.
- 17½ Feet—Two White Balls, full height, placed vertically.
- 20 Feet—Third White Ball, half mast.
- 22½ Feet—Three White Balls, vertical.
- 25 Feet—Two White Balls, horizontal.
- 27½ Feet—Third White Ball, half mast.
- 30 Feet—Three White Balls, triangle.

Flagstaff and Lamps by Night.

The same signals as by Day, with similarly coloured Lamps instead of Balls.

Danger—No signals by Day or Night.

NOTE.

The preceding Report having been submitted to the Commissioners, they directed it to be circulated with the following Letter to Shipmasters and others. It is now printed with the Answers which have been received.

Northern Lighthouse Office,
Edinburgh, 1858.

Sir,—The secretary having recently submitted to the Commissioners of Northern Lighthouses a Report on his proposed Code of Uniform Buoys and Tide Signals, the Commissioners have resolved to take the opinion of practical seamen on the proposal, and I am now directed to send you a copy of the Report.

The Commissioners will esteem it a favour if you will state in a letter to me whether you approve or disapprove of the proposed schemes, and if you will at the same time offer any suggestions or improvements which may occur to you. In considering the general applicability of the scheme, the Commissioners are very desirous that you should keep in view such localities as Yarmouth Sands and the entrance to the Thames, and any other dangers of similar description and extent with which you may be acquainted.

I am, Sir,

Your most obedient Servant,
(Signed) ALEX. CUNINGHAM, Secy.

SCOTLAND.

Circular V.
Question
XII.

XII. (System.)

ANSWERS.

Inveresk, by Musselburgh,
28th June, 1858.

Sir,—Having carefully perused and well considered all the propositions laid down in the Report by the Secretary to the Commissioners of Northern Lighthouses, on the proposed establishment of an uniform code of buoy and tide signals, I have the honour to give it as my professional opinion (as requested by the Honourable Commissioners) that I consider the Report quite clear, the suggestion contained in it quite simple, and easy to be understood; and I have no further observations to make than that I hope to see the "Code" universally adopted; and I wish the good work the success it deserves.

I am, &c.,
(Signed) GEORGE B. JEFFREYS,
Inspecting Commander, Coast Guard.

Old "Pharos" Steamer,
Granton, 28th June 1858.

Sir,—I have carefully perused the Report made by you to the Commissioners of Northern Lighthouses on the proposed establishment of an uniform code of buoy and tide signals, and beg leave to say that I quite approve of its general application to all localities; its uniformity and simplicity make it easily understood and retained in memory—a thing of the utmost importance at all times when navigating intricate channels. Where long and crooked channels exist, I think it would be desirable to number the buoys, as in hazy weather it is important to know how far a vessel has advanced up or down, the number on the buoy would at once make it known. I consider it an important advantage of the tide signals that a vessel can show her draught of water under the same uniform code. What you propose to adopt is quite serviceable for any port or harbour, and is enhanced in importance by being as easily distinguished by night as by day.

I am, &c.,
(Signed) WILLIAM WATT.

11, Portland Place,
3d July 1858.

Sir,—I beg to inform you that I have read over the Report which you sent to me yesterday, and that I fully concur in the plans there laid down. The system of buoyage appears to me so plain and simple, that any one may at a glance understand it without danger of making a mistake; and when a stranger, under the old system, would have to have continued recourse to his chart or book of directions, he could, under the new system, run in with perfect confidence and safety. At the same time I think that, where there are two or more channels, the buoys belonging to each should be marked with the name of the channel to which it belongs. With regard to the outer buoy, there is no doubt that one with a mast and ball is the best, as it would be seen farther, the black one especially. Fully concurring, as I do, in your plan, which I have discussed with several shipmasters before seeing the Report, I have only to suggest, that where any abrupt bend may occur in any channel, that the buoy there placed should be distinguished, keeping still the same colours, they might be of a different shape from those either above or below.

I may here remark, that the river Elbe is buoyed on nearly the same plan, the colours being white and black; and I know of no place of equal danger that I would run into without a pilot as into the Elbe, after having got sight of the outer buoy.

With regard to the tide signals, there is no doubt but that balls are preferable to flags, for, when the wind is either blowing to or from the flagstaff, they cannot be well seen; or of course the balls could be seen in any position.

With these remarks, and having no doubt but that your plan will meet with the approbation of all nautical men,

I am, &c.,
(Signed) ROBERT WRIGHT.

3, Harold Terrace, Fairfield Road, Bow,
5th July 1858.

Sir,—I beg to acknowledge receipt of your favour of 2d inst., requesting my opinion on your proposed system of uniform buoys and tide signals.

I have carefully examined the Report enclosed, and I consider the arrangement which you advocate to possess great advantages over the present system, chiefly on account of its simplicity, enabling mariners to navigate any channel without reference to their chart. The scheme would, in my opinion, be eminently adapted to such localities as Yarmouth Roads and the entrance to the Thames.

BUOYS AND BEACONS.

XII. (System.)

I do not think anything better, to indicate the turning point seaward in a main channel, can be suggested than what you propose in rule 2.—viz., a red buoy with a mast and ball of corresponding colour for the starboard side, and a black buoy with a mast and ball of same colour for the port side.

With reference to the signals for indicating a centre danger in a main channel, provided for in clause 3, I think they are all that can be desired; and the same may be said of the buoys for indicating a centre danger of any size in a main channel, and the direction in which it lies, provided for in clauses 4 and 5.

Your system of tide signals, both by day and night, appear to me to be remarkably simple, and with your code in his hand no master would have any difficulty in understanding them.

In conclusion, permit me to say, that I do not think I can suggest anything which will be an improvement on your scheme, as every point seems to have been well considered by you.

I am, &c.,
(Signed) DAVID MEIKLEREID.

H.M.S., "Jackall," Granton,
8th July 1858.

Sir,—In answer to your letter of the 6th inst., I beg to state that I fully approve of the proposed scheme. The want of an uniform code of buoys has long been felt; it is in every way most desirable and necessary. I do not see that I can suggest any improvements.

I am, &c.,
(Signed) C. T. W. G. CERJAT.

Trinity House, Leith,
9th July 1858.

Sir,—I duly received your communication of 2d inst., on the proposed establishment of an uniform code of buoy and tide signals.

After a careful perusal, I very much approve of the same. I would, however, take the freedom of suggesting that, in a long line of course, in a fairway in one direction, at any spot where such course has to be changed several points, a distinguishing buoy might there be placed to indicate the change, say a red and white striped buoy on the starboard, and black and white on larboard hand, which would still preserve the marking colours.

I am, &c.,
(Signed) WALTER PATON.

Trinity House, Dundee,
27th July 1858.

Dear Sir,—Mr. Welch, the Master of the Trinity House, submitted your letter, of the 2d current, to a meeting of the acting committee held to-day, and I refer you to the annexed excerpt from their minutes, showing the resolution come to, which I trust is satisfactory to you.

I am, &c.,
(Signed) JAMES M'EWEN, Sec.

Excerpt from Minutes of Meeting of the Committee of the Fraternity of Masters and Seamen in Dundee, held in the Trinity House, on the 27th day of July 1858.

"The boxmaster laid before the meeting a circular letter which he had received from Alexander Cunningham, Esq., Secretary to the Commissioners of Northern Lighthouses, of date the 2d current, relative to a Report by him on his proposed code of uniform buoys and tide signals, and which Report the Commissioners wished laid before practical seamen for their opinion; the relative Report was read, and the meeting having considered the matter, resolved to approve of the proposed schemes by Mr. Cunningham, and the secretary was instructed to write to him accordingly, with an extract of the minute."

Oban, 5th August, 1858.

My dear Sir,—I beg to inclose a letter from my brother, Captain G. Bedford, on the subject of your Report. He commands a survey on the west coast of Ireland, and has done so for a long time, besides having served in Canada and Africa. You are at liberty to make any use of it you please. I hope soon to hear of other favourable returns from you. In haste,

Yours, &c.,
(Signed) E. J. BEDFORD.

My dear Edward,—I have read Mr. Cunningham's pamphlet on the proposed establishment of an uniform code of buoys and tide signals with much satisfaction, and

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XII. (System) to XVII. XVIII.

BUOYS AND BEACONS.

XVII. & XVIII.

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I give the principle my hearty approval, from a conviction that it is calculated to be of great advantage to the coast and harbour navigation. I congratulate you, as the suggester of this useful scheme, in having found such an able and liberal co-operator as Mr. Cunningham seems to be.

With reference to the scheme proposed, I would remark that, in buoying a complicated place, such as the numerous creeks and channels off North Yarmouth and Lowestoft, some greater variety than that of colour seems to be required to indicate the particular channel, as well as its limits; and I am disposed to name as well as number the buoy, which would not impair the simplicity of the system, as these additional distinctions may be disregarded provided the vessel's position is known; while, in the event of a fog, or other casualty, limiting the vision to a small distance, the sight of a buoy so numbered or named, and marked on the chart, would at once indicate the whereabouts, and enable the vessel to be steered for the next. Where several buoys are required to mark a channel or danger, I conceive this precaution would be useful.

In long and narrow channels, such as Lough Foyle, leading to Londonderry, it is evident that buoys become of little service during dark nights, and to render them available at such a time coloured lights must be substituted. It seems to me desirable that uniformity of colour be maintained; but as black is excluded from lights, and the use of another colour would interfere with the principle of the system, why not substitute green buoys for black, and then have green lights, by which the day and night colours would be kept alike?

Both in Belfast and Lough Foyle, the channel is marked by pile beacons, painted in distinctive colours, and exhibiting coloured lights at night.

There would be no difficulty in making these lights indicate their position, by using transparencies, either in number or name.

Yours, &c.,
(Signed) GEO. AUGUSTUS BEDFORD.

Addressed, Capt. Bedford, R.N.

- XIII. NO SYSTEM. SEE REPORT.
- XIV. MERCANTILE MARINE FUND.
- XV. DITTO.
- XVI. INCOME, nil.
- Expense { 1852 £1,599 17 4.
- { 1853 1,458 15 5.
- XVII. and XVIII.—

III.
V.
VI.

XII.
XIII.

1. STROMA BEACON.

11th July 1853.—Application from Lloyd's for a beacon on Stroma.

15th July 1853.—Remitted to engineer, to report.

1st August 1853.—Reply to Lloyd's, by secretary, stating that the Commissioners have long had under consideration the desirability of placing a beacon on Stroma, and that they had now ordered a survey and estimate to be prepared, in the view of considering whether it may be embraced in the works for next year.

15th December 1854.—Report by engineer, and submitting survey.

18th December 1854.—Letter to Trinity House with plan and report, and requesting statutory sanction.

10th January 1855.—Answer from Trinity House, approving of beacon.

13th January 1855.—Sanction of Board of Trade obtained for beacon in estimate of 1855.

8th November 1855.—Letter from Board of Trade wishing plan of beacon.

21st November 1855.—Answer by secretary, transmitting ditto.

2. SOUND OF ISLAY.

11th April 1854.—Letter from Board of Trade transmitting copy letter from Admiralty enclosing copy report by Captain Bedford, as to desirability of placing a beacon on western head of Black Rock, and also one upon the Culean Rocks.

10th May 1854.—Commissioners remit to engineer for his report, and direct secretary to send copy of Captain Bedford's report to Trinity House, in order that they may have the subject before them when visiting that part of the coast.

11th May 1854.—Letter by secretary to Trinity House in conformity.

3. KILCHOAN.

31st May 1854.—Letter from Mr. Robertson, Kinloch Moidart, as to desirability of a beacon at Kilchoan.

7th June 1854.—Answer by secretary stating that Commissioners do not undertake the erection of buoys of so purely local a character.

15th June 1854.—Reply by Mr. Robertson stating that he cannot look upon a beacon as of so purely a local cha-

acter as the Commissioners, and suggesting that they ought to consult Captain Otter, R.N., or their own officials.
21st June, 1854.—Commissioners consider it unnecessary to do more in the matter.

4. KYLES OF BUTE.

5th October 1854.—Application from Mr. Campbell Ormisdale, for buoy to be placed on rock at entrance to Loch Riddan.

18th October 1854.—Commissioners remit to engineer to report.

18th October 1854.—Reply by secretary to Mr. Campbell, stating that his application had been remitted to engineer for his report, but that Commissioners apprehended it was of too private and local a character to be undertaken by them.

26th October 1854.—Answer from Mr. Campbell, further explaining position of rock, and suggesting that if Captain Bedford were consulted, the Commissioners would be satisfied it was a matter of public utility.

1st November 1854.—Report by engineer on application, and stating that a buoy would no doubt be useful, but ought to be placed and maintained by those having charge of the harbour.

1st November 1854.—Commissioners remit back to engineer, with instructions to communicate with Captain Bedford.

2nd November 1854.—Reply by secretary to Mr. Campbell, stating that the matter had been remitted back to engineer, with directions to communicate with Captain Bedford.

14th November 1854.—Report by engineer with letters from Mr. Campbell and Captain Bedford enclosing a tracing, and stating if a red or chequered buoy were placed as indicated, it would greatly benefit navigation.

29th November 1854.—Application of Mr. Campbell refused, but remit to engineer, to inquire into the expediency of mooring buoys (as part of the general system) throughout the Kyles of Bute.

29th November 1854.—Letter from secretary to Mr. Campbell intimating decision of Commissioners.

23d September 1858.—Report by engineer stating that 2 red buoys on South Channel and a black buoy on north side would complete the buoyage in the most perfect manner.

20th October 1858.—Letter to Trinity House requesting statutory sanction.

26th October 1858.—Answer from do., approving.

3rd November 1858.—Letter from Board of Trade as to expense of buoys.

9th October 1858.—Reply by secretary stating that each buoy will cost from 16*l.* to 18*l.*

5. BLACK ROCKS, LEITH.

17th October 1854.—Application from Mr. Inkster, Leith, for a beacon on the Black Rocks.

23d October 1854.—Report by engineer stating that it ought to be erected by those having charge of the harbour.

1st November 1854.—Secretary directed to refer Mr. Inkster to Leith Dock Commissioners.

6. LOCHS INVER AND INCHARD.

27th March 1855.—Letter from Mr. Mc Iver, Scowrie, as to desirability of placing a perch on rock at entrance to Loch Inchard.

6th April 1855.—Letter from do. as to do. at Loch Inver.

23rd April 1855.—Commissioners remit the above to engineers to report.

3d October 1855.—Report by engineers stating that they consider an iron spur beacon would be of very great service to vessels frequenting Loch Inver, if erected on Bocoalas Rock; and regarding Loch Inchard, as the rock is too low to admit of the adoption of a beacon, a buoy might prove useful to vessels taking shelter during westerly gales.

10th October 1855.—Commissioners of opinion that application should be granted.

12th October 1855.—Letter to Trinity House requesting statutory sanction for beacon on Loch Inver and buoy on Loch Inchard.

12th October 1855.—Letter to Board of Trade, transmitting copy letter to Trinity House, and stating that should my Lords approve, the Commissioners propose to use an iron spur beacon prepared for another site, but not erected in consequence of the Board of Fisheries having placed a beacon on site alluded to.

17th October 1855.—Answer from Trinity House approving of do.

26th October 1855.—Answer from Board of Trade approving of do., and requesting that plans may be furnished of the intended sea marks.

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29th October 1855.—Reply to Board of Trade stating that Commissioners had transmitted chart showing position of sea marks to Elder Brethren, and understood that they would have forwarded it to my Lords, and requesting to be informed whether in future any charts, &c. would require to be transmitted in duplicate.
3d November 1855.—Answer from Board of Trade stating that one copy will be sufficient.

7. LIPPA ROCK.

25th May 1855.—Petition from Fishermen, &c. of Orkney for replacing a buoy on Lippa Rock.
30th May 1855.—Engineers to report why buoy was removed, and how it can be replaced.
23d October 1855.—Report by engineers stating that buoy having of necessity been moored in a very rapid tide-way, caused it to *ride under*, and it was considered proper in consequence to discontinue it, but should its restoration be considered essential, it might be possible to design such a buoy as would obviate the effects of the rapid tide-way.
24th October 1855.—Engineers to report whether the restoration of the buoy is essential.

8. BROAD EBB.

10th October 1855.—Petition from shipmasters, Orkney, for a buoy on Broad Ebb.
10th October 1855.—Commissioners remit ditto to engineers to report.
23d October 1855.—Report by Messrs. Stevenson, stating that a buoy there would be very useful.
24th October 1855.—Letter to Trinity House requesting statutory sanction.
24th October 1855.—Letter to Board of Trade transmitting copy letter to Trinity House, and requesting sanction.
30th October 1855.—Answer from Board of Trade conveying approval.
31st October 1855.—Ditto from Trinity House ditto.

9. VASA.

10th October 1855.—Petition from shipmasters, Orkney, for a beacon on Vasa.
10th October 1855.—Commissioners of opinion petition should be granted.
24th October 1855.—Letter to Trinity House requesting statutory sanction.
24th October 1855.—Letter to Board of Trade ditto.
31st October 1855.—Answer from ditto approving of ditto.
31st October 1855.—Answer from Trinity House approving of ditto.
9th January 1858.—Letter from Mr. Baikie, Kirkwall, stating that beacon, being a skeleton one, is nearly useless.
12th October 1858.—Report by Messrs. Stevenson on ditto, and proposing to place a larger ball upon it than at present.

10. SOUND OF SANDA.

1st November 1855.—Letter from Board of Trade transmitting copy letter from Glasgow Local Marine Board, suggesting that a buoy or beacon should be placed on the rocks near Sanda, on which the "Myrtle" steamer struck on 3d August 1854.
8th November 1855.—Commissioners remit ditto to engineer to report.
18th November 1855.—Report by engineer, recommending that the request of Glasgow Local Marine Board be acceded to.
22d December 1855.—Letter to Board of Trade, stating that Commissioners are quite ready, on my Lords' sanction being signified, to moor a buoy on the rock in question.
31st December 1855.—Answer from Board of Trade, requesting plan showing position of proposed buoy.
7th June 1856.—Reply by secretary, transmitting sketch of Mull of Kintyre, and showing position of buoy.
11th June 1856.—Answer from Board of Trade approving, but suggesting that it be placed nearer the shore, and changed in colour.
12th June 1856.—Commissioners direct Messrs. Stevenson to report.
15th June 1856.—Report by Messrs. Stevenson, differing from Board of Trade's suggestions.
30th June 1856.—Commissioners direct secretary to write to Board of Trade in conformity.
14th February 1856.—Letter to Board of Trade regarding ditto.
20th February 1856.—Answer from ditto, stating that my Lords do not wish to fetter the Commissioners' decision in this matter.

11. CAIRNBURG BRIGGS.

28th November 1855.—Report by secretary, stating, that at intervals from 1840 to 1852, this place had been before the Board without any decision having been come to, and pointing out the desirability of erecting a beacon on ditto.
29th November 1855.—Commissioners resolve to erect a beacon, and remit to Messrs. Stevenson to report on site.
29th January 1856.—Report of Messrs. Stevenson, with plan of proposed site.
30th January 1856.—Application to be made to Trinity House and Board of Trade for statutory sanction.
31st January 1856.—Letter to Trinity House requesting ditto.
31st January 1856.—Ditto to Board of Trade ditto.
8th February 1856.—Reply from Trinity House approving.
19th February 1856.—Ditto from Board of Trade, wishing to know expense of beacon before approving.
20th February 1856.—Messrs. Stevenson to prepare estimate.
21st February 1856.—Letter from Messrs. Stevenson stating that they shall revisit the rock before giving an estimate.
21st February 1856.—Letter to Board of Trade as to Commissioners incurring this expense before the work is sanctioned.
25th February 1856.—Reply from Board of Trade, wishing estimate as soon as it can be furnished, which they think can be done without the engineers proceeding to the spot.
27th February 1856.—Commissioners direct Messrs. Stevenson to furnish estimate, and, if necessary, proceed to the spot.
15th November 1856.—Report by Messrs. Stevenson proposing beacon to be of cast-iron, and estimating cost at about 1,000*l*.
20th November 1856.—Letter to Board of Trade stating estimated cost.
9th December 1856.—Application from shipmasters of Frazerburgh for beacon on Cairnburg Briggs.
24th December 1856.—Commissioners direct secretary to transmit ditto to Board of Trade.
29th December 1856.—Reply from Board of Trade to secretary's letter of 20th ultimo, stating that estimated expense appears to be large, and asking whether a cast-iron beacon, or a skeleton beacon with ball, would best serve the purpose.
7th January 1857.—Answer by secretary, stating that it is a cast-iron skeleton beacon which is recommended.
13th January 1857.—Reply by Board of Trade, requesting plans to be submitted for approval of Trinity House.
15th January 1857.—Answer by secretary, stating that plans had been already submitted to Trinity House, and their approval signified.
23d January 1857.—Reply from Board of Trade wishing plans.
29th January 1857.—Answer by secretary, transmitting sketch of beacon.
31st January 1857.—Letter to Trinity House for sanction to kind of beacon.
5th February 1857.—Reply from Trinity House conveying ditto.
27th February 1857.—Letter from Board of Trade sanctioning beacon, but reduced in height.
9th March 1857.—Report by Messrs. Stevenson, with plan of smaller beacon, and stating that it will neither be so well seen, nor will it afford the same means of shelter, in the event of persons being cast ashore on the rock, as the beacon formerly proposed.
11th March 1857.—Commissioners direct secretary to write to Board of Trade, explaining their preference for larger beacon; but remit to Messrs. Stevenson to proceed with plans of smaller one, and to the secretary to take tenders for its construction.
9th April 1857.—Report by Messrs. Stevenson on tenders, and recommending Messrs. Milne and Son.
17th April 1857.—Letter from Board of Trade accepting tender of Mr. Douglas.
24th April 1857.—Letter from Mr. Douglas wishing to withdraw his tender.
25th April 1857.—Letter to Board of Trade as to Mr. Douglas' withdrawal.
4th May 1857.—Reply by Board of Trade releasing Mr. Douglas from his engagement, and requesting that Mr. Scott's offer be accepted.
7th May 1857.—Answer by secretary, stating Commissioners' opinion that Mr. Scott's offer should not be accepted.
12th May 1857.—Reply by Board of Trade, stating they

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cannot accept of Messrs. Milne's tender when a lower can be had.

22d May 1857.—Answer by secretary, stating, that having submitted to my Lords the reasons which induced them to form a decided opinion against the acceptance of Mr. Scott's offer, they consider they have discharged their duty, and that he had applied to Mr. Scott to know whether he adhered to his offer.

17th June 1857.—Contract with Mr. Scott entered into.

12.—LOCH FYNE.

5th December 1855.—Application from Board of Fisheries for buoy on Big Rock.

6th December 1855.—Report by buoy master, stating that it is unnecessary to place a buoy off the rock referred to.

7th December 1855.—Letter by secretary to Fishery Board in conformity.

13.—SOUND OF SKYE.

21st May 1856.—Letter from Messrs. Hutchison and Co., about necessity of having beacons on west coast.

28th May 1856.—Commissioners direct Messrs. Stevenson to report on ditto.

6th November 1856.—Report by Messrs. Stevenson that various rocks should be marked, and recommending a buoy on the Gulanre Rock, a buoy for the McMillan Rock, a beacon for the Gohblach Reef, Pabba, and either a buoy or beacon for Skeriderrick.

13th November 1856.—Letter to Board of Fisheries intimating that applications for beacons and buoys in Sound of Skye were granted.

13th November 1856.—Letter to Board of Trade transmitting charts, showing positions of dangers proposed to be marked, and requesting sanction.

29th December 1856.—Answer from Board of Trade requesting copy of Messrs. Stevenson report before giving sanction.

7th January 1857.—Letter to Board of Trade transmitting copy of engineers' report.

10th January 1857.—Answer from Board of Trade calling attention of Commissioners that proposed works have not been laid before the Trinity House, and suggesting whether a buoy on the Gohblach Reef would not answer the purpose as well as the expensive beacon proposed by engineers.

15th January 1857.—Letter to Trinity House transmitting copy of Commissioners' communication to Board of Trade and tracings of relative chart, with a request for their statutory sanction.

22d January 1857.—Answer from Trinity House sanctioning buoys on Gulanre and McMillan's Rock, but wishing further information as to Gohblach.

28th January 1857.—Commissioners delayed till sanction of Board of Trade was signified.

17th June 1857.—Messrs. Stevenson to proceed with buoys and beacons in this ground.

1st July 1857.—Messrs. Stevenson to prepare plan of beacon at Pabba.

4th September 1857.—Letter to Board of Trade with tenders for ditto.

15th September 1857.—Answer from Board of Trade approving of Mr. Dove's offer being accepted.

14.—SCARGUN SHOALS.

31st December 1857.—Petition from shipmasters at Kirkwall, and letters from Oban and Leith requesting buoy on ditto.

11th January 1858.—Letter to Trinity House stating that Commissioners are of opinion application should be granted, and requesting their statutory sanction.

13th January 1858.—Answer from Trinity House approving of ditto.

27th January 1858.—Letter from Board of Trade ditto.

15.—SALEN

20th March 1858.—Application for buoy in Bay of Salen.

25th March 1858.—Letter to Trinity House stating that Commissioners are of opinion application should be granted, and requesting statutory sanction.

25th March 1858.—Letter to Board of Trade ditto.

31st March 1858.—Answer from Trinity House conveying sanction, and recommending a large buoy.

1st April 1858.—Ditto from Board of Trade approving sanction.

16.—LOCH CROAG.

8th April 1858.—Application for buoys to mark the entrance to Loch Croag in Mull.

12th April 1858.—Letter to Captain Bedford asking him to favour Commissioners with his opinion on application.

12th April 1858.—Letter to Captain Sinclair, "Skerryvore" tender, ditto.

14th April 1858.—Answer from Captain Bedford stating that the bay is so studded with rocks and the shelter so imperfect that he could not advise Commissioners to offer any inducement to the general trader seeking it for refuge.

22d April 1858.—Reply from Captain Sinclair doubting very much the practicability of mooring a buoy there.

27th April 1858.—Commissioners refuse application.

17.—TUISDALE.

28th April 1858.—Application from shipmasters, Isle of Man, for a beacon in Calf Sound.

13th May 1858.—Report by Captain Anderson agreeing entirely with application, and stating it would be of immense advantage, and add greatly to the safety of vessels passing through the Sound.

15th May 1858.—Letter to Trinity House transmitting application, and requesting statutory sanction.

19th May 1858.—Letter from Trinity House conveying sanction, and transmitting copy letter from Board of Trade to them also approving.

22d September 1858.—Report by Messrs. Stevenson recommending that an iron pillar beacon be erected.

20th October 1858.—Letter to Board of Trade stating that Messrs. Stevenson's estimate cost of beacon at about 800*l*.

3d November 1858.—Answer from Board of Trade wishing sketch of beacon and rock, showing its height, &c.

8th November 1858.—Reply by secretary, transmitting sketch.

18th November 1858.—Answer from Board of Trade inquiring whether a smaller beacon would not be sufficient, as it appears to them, one 20 feet high would do; and if so, requesting an amended estimate.

23d November 1858.—Reply by secretary, stating that Commissioners do not concur in the views expressed by my Lords, and giving special reasons for such.

6th December 1858.—Answer from Board of Trade stating that, after full inquiry and deliberation, they think it unnecessary to incur so much expense, and requesting an amended estimate for a beacon without cage on top.

8th December 1858.—Report by Messrs. Stevenson stating that the saving effected by omitting the cage would be only about 16*l*., and submitting plan of a malleable iron beacon 25 feet in height, at an estimated cost of 400*l*.

10th January 1859.—Reply to Board of Trade transmitting engineer's report and tracing.

14th January 1859.—Answer from Board of Trade requesting to know why Messrs. Stevenson propose that the beacon should be of malleable instead of cast iron, as before proposed, and if the 400*l* is estimated to cover the whole expense of erecting as well as constructing.

17th January 1859.—Letter from Mr. Stevenson in answer giving explanations as to ditto.

24th January 1859.—Answer from Board of Trade requesting to be informed whether Messrs. Stevensons' hesitation about security of the beacon arises wholly from the fact of its exposure to a heavy sea.

25th January 1859.—Reply by secretary stating that it is partly so, and partly from the new material of beacon.

7th February 1859.—Answer from Board of Trade approving of a malleable iron beacon in accordance with tracing sent in letter of 10th ult.

22d February 1859.—Report by Messrs. Stevenson on tenders for beacon, and recommending Messrs. Tods' offer.

24th February 1859.—Letter to Board of Trade transmitting tenders.

1st March 1859.—Answer from Board of Trade approving of Messrs. Tods' tender being accepted.

18.—LONG CRAIG.

2d July 1858.—Application for a beacon on Long Craig, Kirkaldy.

29th November 1858.—Report by engineers stating that the danger can be advantageously marked only by a buoy moored at the outer extremity of the reef.

30th November 1858.—Letter to Trinity House requesting statutory sanction for ditto.

7th December 1858.—Reply from Trinity House conveying sanction.

11th December 1858.—Letter from Board of Trade approving ditto.

19.—LOCH ERRIHOL.

28th June 1858.—Application for a beacon or buoy on Loch Errihol.

28th June 1858.—Remitted to Captain Anderson to report.

20.—ARISAIG.

24th February 1859.—Letter from Board of Trade with enclosures for a beacon at Arisaig.

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- 10th March 1859.—Reply by secretary, stating that beacon would be of no benefit to vessels passing, and that no beacon of any permanent character could be erected for 5*l*.
21. APPIN.
- 9th September 1858.—Letter from Captain Bedford as to buoying rocks in ditto.
- 9th February 1859.—Report by Messrs. Stevenson on ditto, with tracing of Sound, and stating that they think a 7½-foot buoy would be sufficient for the Black Rocks, and that a beacon should be placed on the Brander Rock.
- 10th February 1859.—Letter to Trinity House requesting their statutory sanction for a buoy on Black Rocks and a beacon on Brander Rock.
- 2nd March 1859.—Reply from Trinity House conveying sanction.
- 7th March 1859.—Letter from Board of Trade approving, and requesting that an estimate of the probable cost may be furnished.
- 10th March 1859.—Answer by secretary stating that the buoy is estimated to cost 40*l*., and the beacon from 150*l*. to 160*l*.
- 14th March 1859.—Reply by Board of Trade requesting to be informed whether the sum of 150*l*. to 160*l*. for the beacon is estimated to cover the whole cost of construction, including fixing, and whether a beacon like Calliach, which only cost 120*l*., would not be sufficient.
- 24th March 1859.—Answer by secretary, stating that the estimate includes carriage and fixing, as usual; and that, while the beacon on Appin Sound is similar to Calliach, the addition to the estimated cost is mainly caused by the additional cleading which is required for the nature of the situation.
- 29th March 1859.—Reply by Board of Trade approving, and requesting tenders to be invited.
- 15th April 1859.—Letter to Board of Trade with tenders, and recommending that Messrs. Slight's offer be accepted.
- 20th April 1859.—Reply from Board of Trade approving ditto.
22. GENERAL SYSTEM OF BUOYAGE.
- 18th November 1857.—Excerpt Report by Secretary.
- “An understanding has for some time prevailed in the mercantile service, that all buoys on entering port should be coloured red for the starboard hand and black for the port hand, while chequered buoys should mark centre dangers. Captain Bedford having urged very strongly that effect should be given to this arrangement with the Commissioners' buoys, the reporter took the opportunity to do so while repainting and shifting them this season. The changes have proved somewhat extensive; but, beyond the expenses of the notices have not called for any outlay. During the ensuing season, so far as not already accomplished, effect will be given to the approved arrangement, which is exceedingly simple, and cannot fail to prove most acceptable to the mariner. The reporter submits further, whether it would not be desirable to call the attention of local authorities to this change, such as the Clyde and Tay Trustees, and get them to follow the improved system.”
- 17th February 1858.—Letter to Trinity House, Dundee, suggesting the adoption of new system of buoyage in river Tay.
- 17th February 1858.—Letter to Clyde Trustees as to ditto on river Clyde.
- 18th February 1858.—Letter to Admiralty regarding its universal adoption.
- 25th March 1858.—Letter to Trinity House, London, transmitting 10 copies of a notice to mariners regarding ditto.
- 14th April 1858.—Reply from Trinity House, acknowledging receipt of notices, and regretting that Commissioners did not afford them an opportunity of offering an opinion on the subject before the plan was finally adopted and published, and offering suggestions, not with the view of condemning the system adopted by the Commissioners, but of explaining the grounds upon which the Elder Brethren regret that an opportunity was not afforded them of expressing their opinion on the subject.
- 28th April 1858.—Reply by secretary, pointing out how system was introduced, and that the Commissioners were unaware that the attention of the Elder Brethren had not been likewise called to the approved system, regretting that the adoption of such an important change should have come only incidentally before them upon a casual communication of the Commissioners, and thanking them for their observations.
- 9th June 1858.—Report by secretary on subject of the proposed uniform code of buoys and tide signals submitted to Commissioners, and authorized to be printed in the view of circulating it extensively to practical seamen for their opinions and suggestions.
- 18th October 1858.—Secretary reported to Commissioners that he had distributed copies of his report on uniform system to different parties, and he submitted their various answers.
- 18th October 1858.—Secretary authorized to get same printed.
- XVIII. Included in the above.
- XIX. Buoy master and secretary.
- XX. Buoy master and secretary.
- XXI. Advertisement.
- CORRESPONDENCE with BOARD OF TRADE regarding advertising NEW LIGHTHOUSES, &c.
- 1.—Letter from Board of Trade.
- London, 3rd May 1858.
- Sir,—I am directed by the Lords of the Committee of Privy Council for Trade, to request that you will draw the attention of the Commissioners of Northern Lighthouses to the large expenditure incurred in the Accounts for the Quarter ending 31st December last, for postages of foreign and colonial letters containing advertisements of the opening of the new lighthouses, amounting to the sum of 12*l*. 13*s*. 7*d*.
- My Lords direct me to state that, on inquiry at the Trinity House as to the practice of the Elder Brethren on such occasions, the following reply has been received:—
- “Notices to mariners are sent by book post from the Trinity House to the outports in England, to the Commissioners in Edinburgh, and to the Corporation in Dublin, also to the consuls in London for distribution or publication in their respective States. The postage is calculated to be about 1*l*. per 1000 notices (i.e., copies of a notice), and the number issued for an important light is from 2,000 to 3,000.”
- My Lords, therefore, are of opinion that so large an expenditure as that incurred by the Commissioners of Northern Lighthouses for this service is not necessary; and I am to request that you will move the Commissioners to adopt the practice of the Trinity House in all future cases.
- I am, &c.,
(Signed) T. H. FARRER.
(Addressed) The Secretary Commissioners of Northern Lighthouses.
- 2.—Answer by Secretary to Board of Trade.
- Northern Lighthouse Office,
Edinburgh, 13th May, 1858.
- Sir,—Having laid before the Commissioners of Northern Lighthouses my Lords' letter of the 3rd current, on the subject of notices of new lights, I am directed to state that since 1846 the Commissioners have been in use to send copies of their notices:—
1. To the public Boards of Great Britain connected with shipping.
 2. To all chart publishers so far as known.
 3. By advertisement in all the newspapers published in maritime ports of the United Kingdom.
 4. By hand bills circulated to the collectors in Scotland, England, and Ireland, in the different ports, for distribution among mariners.
 5. 500 copies to the India House for circulation in India.
 6. To all the consuls of foreign powers resident in London.
 7. To British consuls at foreign ports.
 8. To collectors of customs at colonial ports.
- Nos. 5, 7, and 8 (the cost of which in postage is now adverted to) were, in 1846, by order of the Commissioners, added to the intimations issued by them. The matter at that time had attracted a great deal of attention, and formed the subject of great discussions in Parliament, arising from the loss of the “Great Britain” in Dundrum Bay (alleged cause, the want of a notice of the new light at St. John's), the loss of an Indianman in the Solway, from not having seen the notice of Little Ross, and mistaking it for a light in the Clyde, and, from a representation made by an officer of the French navy coming up the Moray Firth from Iceland being misled by Corseca, not having seen the notice of its exhibition.
- Such were the reasons which induced the Commissioners to call for a re-consideration of the whole subject, and on a report of the previous practice, to resolve that their notices should be sent abroad. They now understand that it is my Lords' desire that they are to revert to the limited circulation, and to restrict their notices to Nos. 4 and 6 of the preceding list, but, before doing so, I have been directed to submit to my Lords the considerations on which the Commissioners proceeded in extending their distribution.
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and to state that they are so satisfied of the advantage arising from the present arrangement that they trust my Lords will not allow the very small outlay to weigh with them in discontinuing that arrangement which has proved so advantageous to the mariner from foreign parts.

I am, &c.,
(Signed) ALEX. CUNINGHAM, Secy.
(Addressed) The Secretary Marine Department,
Board of Trade.

3.—Reply from Board of Trade.
London, 4th June 1858.

Sir,—With reference to former correspondence on the subject of the expense incurred by the Commissioners of Northern Lighthouses for advertising and circulating notices by post relating to new lights, I am directed by the Lords of the Committee of Privy Council for Trade to transmit to you the accompanying copy of a letter from the Elder Brethren of the Trinity House, containing a statement of the practice pursued by that Corporation with respect to publishing notifications of English lights at home and abroad, and showing the expense incurred for each notice.

My Lords suggest for the consideration of the Commissioners that the practice of the Elder Brethren answers the purpose of giving ample publicity to these notices, and that it will therefore be desirable that a similar course should be adopted by all the lighthouse Boards.

The Commissioners will observe that, according to this practice, foreign consuls obtain the requisite notices, and that it is the duty and practice of these officers to send them home to their own countries, just as British consuls send home notices of foreign lights.

I am, &c.,
(Signed) T. H. FARRER.
(Addressed) A. Cuningham, Esq.
(Enclosure referred to.)

Trinity House, London,
29th May 1858.

Sir,—Having brought under the consideration of the Elder Brethren your letter of the 20th instant, relative to the expense incurred by the Commissioners of Northern Lighthouses for advertising and circulating notices by post, relating to new lights, comparing the same with similar items of expenditure in the accounts of this corporation, and stating that the Lords of the Committee of Privy Council for Trade are of opinion that the practice should be uniform, and request to be favored with the Elder Brethren's opinion thereon, and especially whether the course pursued by them answers the purpose of giving ample publicity in the United Kingdom and foreign parts, I am directed to transmit to you for their Lordships' information the accompanying statement and distribution of the notices issued in December last relative to the intended exhibition of the Bishop Rock Light, and the expense incurred in that instance, and to state that the Elder Brethren concur with their Lordships in opinion that the practice in this respect should be uniform as far as may be practicable, and that they have every reason to believe that ample publicity is given in the United Kingdom and in foreign parts by the system of distribution which has for many years been in use by this Board, aided by the re-issue of the notices by the hydrographer of the Admiralty.

Their Lordships will observe that the expense as shown in your statement is considerably in excess of the sum named in your letter, and that then there was a subsequent general issue of the notice on the 29th ult., in consequence of the mistake made by the master of the American ship "Roscius," the expense of which will be nearly the same as above, and although printed notices of the Bishop Rock Light will not be again distributed, the advertisement will have to be re-published occasionally in the newspapers.

I am, &c.,
(Signed) P. H. BERTHON.
(Addressed) The Secretary Marine Department,
Board of Trade.

STATEMENT of the Expense of Printing and Advertising a Notice to Mariners of the Light to be exhibited from the Bishop Rock Lighthouse; and of forwarding Copies to the various Ports, &c. (as shown in the List appended hereto) for distribution:—

	£ s. d.
Cost of printing 2,500 copies of the notice	2 14 0
Cost of advertising same in London papers, as per list	3 18 6
Postage (by book post) of copies for distribution at the outports, as per accompanying list	1 6 0
	£7 18 6

Bishop Rock Lighthouse.—Notice dated 15th December, 1857; sent out 17th December, 1857.

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	North Sea.	
Berwick, &c.	-	10
Newcastle	-	50
Shields, &c.	-	30
Sunderland, &c.	-	50
Hartlepool	-	20
Stockton, &c.	-	30
Whitby	-	10
Scarborough	-	10
Hull, &c.	-	50
Goole, &c.	-	20
Gainsbro', &c.	-	10
Grimby	-	10
Boston	-	10
Wisbeach	-	10
Lynn, &c.	-	10
Wells, &c.	-	10
Yarmouth, &c.	-	30
Lowestoft, &c.	-	10
Woodbridge, &c.	-	20
Ipswich	-	20
Harwich	-	20
Colchester, &c.	-	20
Maldon, &c.	-	20
Gravesend	-	50
Rochester, &c.	-	20
Faversham, &c.	-	20
Ramsgate, &c.	-	30
Deal	-	20

	English Channel.	
Dover	-	20
Folkstone, &c.	-	20
Rye, &c.	-	20
Newhaven, &c.	-	20
Shoreham, &c.	-	20
Arundel, &c.	-	20
Portsmouth, &c.	-	20
Southampton, &c.	-	20
Cowes, &c.	-	20
Poole, &c.	-	10
Weymouth	-	20
Bridport	-	10
Lyme	-	10
Exeter, &c.	-	20
Teignmouth, &c.	-	20
Dartmouth	-	20
Plymouth, &c.	-	20
Fowey, &c.	-	20
Truro, &c.	-	20
Falmouth	-	20
Penzance	-	20
Scilly	-	40
Scilly Pilots	-	40

	British Channel.	
St. Ives, &c.	-	20
Padstow, &c.	-	20
Bideford, &c.	-	20
Barnstaple, &c.	-	20
Bridgewater, &c.	-	20
Bristol, &c.	-	20
Gloucester, &c.	-	20
Chepstow	-	20
Newport	-	20
Cardiff, &c.	-	20
Swansea	-	20
Llanely, &c.	-	20
Milford, &c.	-	20

	St. George's Channel.	
Cardigan, &c.	-	20
Aberystwith, &c.	-	20
Cararvan	-	20

	Irish Sea.	
Beaumaris, &c.	-	20
Chester	-	20
Liverpool	-	50
Runcorn	-	10
Preston, &c.	-	10
Fleetwood	-	10
Lancaster, &c.	-	10
Whitehaven, &c.	-	10
Workington, &c.	-	10
Maryport, &c.	-	10
Carlisle, &c.	-	10

	Ireland (East Coast).	
Londonderry, Coleraine, Bellast, Strangford, &c.	-	50

SCOTLAND.

XXI.

BUOYS AND BEACONS.

XXI.

Circular V.
Question
XXI.

	(West Coast.)	
Skiberreen, Tralee, Limerick, Galway, &c. &c.	-	50
	Scotland (East Coast).	
Leith, Bo'ness, Grangemouth, Alloa, Kirkcaldy, &c. &c.	-	50
	(West Coast.)	
Glasgow, Port Glasgow, Greenock, Irvine, Ayr, &c. &c.	-	50
Examining Committee	-	6
Admiralty	-	30
Admiralty Hydrographer	-	2
Customs Secretary	-	12
Register General of Seamen	-	6
Lloyd's—Captain Halstead	-	12
Coal Exchange, fixed up at	-	1
Royal Exchange, ditto	-	1
Ballast Office, for distribution	-	100
Lighthouse Office, ditto	-	100
Trinity Steam Vessels	-	3
River Pilots	-	
North Channel Pilots	-	
South Channel ditto	-	
Mr. Bailey, Milford	-	1
Mr. Freemont, Chartroom	-	1
Mr. Laurie, Fleet Street	-	1
Mr. Potter, Poultry	-	1
Mr. Taylor, Minories	-	1
Mr. Davie, Yarmouth	-	1
Times	-	1
Public Ledger	-	1
Shipping Gazette	-	1
Ditto Editor of	-	1
Lloyd's List	-	1
Daily News	-	1
Morning Herald	-	1
United Service Gazette	-	1
Naval and Military Gazette	-	1
London Gazette	-	1
		<u>2,058</u>

	Consuls for	
America	-	20
Austria	-	20
Belgium	-	20
Brazil	-	20
Denmark	-	20
France	-	30
Frankfort	-	20
Hanover	-	20
Hanse Towns	-	20
Mecklenburg Schwerin	-	20
Netherlands	-	20
Portugal	-	20
Russia	-	20
Prussia	-	20
Sardinia	-	20
Spain	-	20
Sweden and Norway	-	20
Turkey	-	20
Tuscany	-	20
Two Sicilies	-	20
		<u>410</u>

4.—Answer by Secretary.

Northern Lighthouse Office, Edinburgh,
10th June 1858.

Sir,—I have to acknowledge receipt of your letter of 4th current, transmitting copy letter from the Trinity House as to the extent of circulation given to notices of new light-houses. Having laid the same before the Commissioners of Northern Lighthouses, I am directed to state that, in obedience to my Lords' directions, the Commissioners will for the future limit the number of notices to be issued in conformity with the rule adopted by the Trinity House.

The Commissioners are now issuing intimations of the lighting of Kanticthead in Orkney, and they direct me to inquire whether this and future intimations of light-houses, &c. in Scotland are to be withheld from all Scotch and local newspapers, and merely to appear in the London newspapers specified in the Trinity House letter.

I am, &c.

(Signed) ALEX. CUNNINGHAM,
Secretary.(Addressed) The Secretary, Marine
Department, Board of Trade.

5.—Reply by Board of Trade.

London, 18th June 1858.

Sir,—I am directed by the Lords of the Committee of Privy Council for Trade to acknowledge receipt of your letter of the 10th instant, asking, with reference to former correspondence, whether, in future, intimations of new lights and light-houses in Scotland are to be withheld from all Scotch and local newspapers, and are merely to appear in the London newspapers.

In reply, I am to acquaint you, for the information of the Commissioners of Northern Lighthouses, that should the Commissioners think it necessary, my Lords see no objection to the insertion of the advertisements relating to Scotch lights in the Edinburgh and Glasgow newspapers in addition to the advertisement in those papers which are mentioned in the Trinity House List.

My Lords do not wish to bind the Commissioners to select the same newspapers as the Trinity House, but only that they should follow the same general system.

I am, &c.

(Signed) T. H. FARRER,

(Addressed) The Secretary, Commissioners
of Northern Lighthouses.

6.—Letter from Board of Trade.

London, 9th March 1859.

Sir,—With reference to the reply on Query No. 38, relating to the charge of 12*l.* 5*s.* 6*d.* for advertisements in the accounts of the Commissioners of Northern Lighthouses for the quarter ending 30th September 1858, I am directed by the Lords of the Committee of Privy Council for Trade to inform you that my Lords, having caused inquiries to be made respecting the practice of the Trinity House in such matters, have received a letter from their accountant on the subject, a copy of which is enclosed; my Lords direct me to request that you will again bring the subject under the consideration of the Commissioners with the view to making the practice of advertising correspond with that adopted by the Trinity House, so far as the different services will permit.

It is to be remembered that notices of all new lights are circulated by the Admiralty to the different custom houses.

I am, &c.

(Signed) JAMES BOOTH.

(Addressed) The Secretary Commissioners
of Northern Lighthouses.

(Enclosure referred to.)

Trinity House, London.

23d February 1859.

My dear Sir,—In reply to your inquiry of the 17th instant as to advertisements published by the Commissioners of Northern Lighthouses, it is quite evident from the copy of account you enclosed that their advertisements in the newspapers are much more numerous than those of the Trinity House. Their plan appears to be regulated by the locality in which the information is most important, while our practice is uniform in advertising all notices, except those relating to wreck buoys, in eight newspapers, all published in London, and we very seldom send an advertisement to a local newspaper. To give one comparison, the expense of advertising a change of system in buoyage of the Firth of Forth, by the account you send is 32*l.* 2*s.* 11*d.*, being 649 single insertions in different papers. A notice of extra five changes in one of the entrances to the Thames will cost about 4*l.* or 5*l.* for insertion in eight newspapers. Taking the amount of our advertising bill from October 1857 to September 1858 (copy of which I enclose) the total 211*l.* 17*s.* 6*d.* divided by the number of notices, &c. 2 gives 4*l.* 4*s.* 9*d.* as an average, per notice, even though some subjects of unusual importance are advertised two or three times. A general coast light notice would, perhaps, 1 published three times, and the cost of the three insertions in all the papers be about 12*l.*

We consider the Shipping Gazette and Lloyd's List to be the best papers for informing the outports, as there scarcely a port or creek in England where they are not read but they may not be so universally received in Scotland. The Times, Public Ledger, Daily News, Morning Herald, United Service Gazette, and Mitchell's Maritime Register make up the number with those above named.

I am, &c.

(Signed) JOHN INGL

(Addressed) H. R. Williams, Esq.

XXI.

BUOYS AND BEACONS.

XXI. to XXVI.

SCOTLAND.
Circular V.

7.—Reply by Secretary to the Board of Trade.

Northern Lighthouse Office, Edinburgh,
24th March 1859.

Sir,—I have to acknowledge receipt of your letter of 9th current on the subject of advertising, and enclosing the letter of the accountant of the Trinity House to the accountant of the Board of Trade on the subject.

The letter of the accountant of the Trinity House excludes from view the printed notices which are issued by the Elder Brethren.

The Commissioners do not, in the cases referred to, issue any notices beyond advertising, and they cannot help, notwithstanding the opinion of the accountant to the Elder Brethren, observing that the true principle of giving intimation seems to be that of publishing in a generally circulating medium and in the local papers.

It would be much better for the Commissioners to desist advertising or issuing any notices than to insert them in the papers mentioned in the letter of the accountant of the Trinity House. Not one of these papers is ever seen in the remote parts of Scotland. The Commissioners have, however, no desire to press their opinion, if my Lords think the accountant of the Trinity House to be a superior authority as to the best means of intimating changes in Scotland. The Commissioners will, in deference to my Lords' directions, refrain from advertising in anything but the papers mentioned, although, at the same time, they will protest against it on account of its intility.

I am, &c.
(Signed) ALEX. CUNINGHAM,
Secretary.

(Addressed) The Secretary, Marine
Department, Board of Trade.

8.—Answer by Board of Trade.

London, 4th April 1859.

Sir,—I am directed by the Lords of the Committee of Privy Council for Trade to acknowledge receipt of your letter of the 24th ultimo on the subject of the advertisements issued by the Commissioners of Northern Lighthouses.

As regards the advertisements of the lights, buoys, and beacons, my Lords desire me to refer the Commissioners to the correspondence which took place on this subject in June 1858. To the opinion then expressed my Lords adhere, and they still think that it is quite needless to advertise in many of the papers mentioned in the Commissioners' list. If there are places on the sea coast in Scotland frequented by persons who are likely to pass new lights, buoys, or beacons where the papers of more general circulation are not to be found, and where printed notices circulated by the hydrographer are not posted, my Lords would suggest that the issue of printed notices by the Commissioners to

be posted at those places would better meet the wants of the case than advertisements in newspapers, many of which never meet the eyes of seafaring persons.

As regards notices for tenders, my Lords wish to leave it to the Commissioners to advertise in such papers as are likely to meet the eyes of those for whom the notices are intended.

The letter from the accountant to the Trinity House, I am to add, was forwarded in my letter of the 9th instant simply for the purpose of explaining the practice of the Trinity House, the principle of which practice, as my Lords have stated before, should, in their opinion, be adopted throughout the United Kingdom.

I am, &c.
(Signed) T. H. FARRER.
(Addressed) The Secretary, Commissioners
of Northern Lighthouses.

XXII. No. BUOY MASTER GOES DOWN.

XXIII. A LETTER FROM A NEIGHBOURING LIGHT-KEEPER OR SOME ONE ON THE SPOT IS RECEIVED.

XXIV. NIL, EXCEPT THE CHANGE REFERRED TO IN THE REPORT.

XXV. NONE, EXCEPT AS EXPLAINED IN THE REPORT.

XXVI. STATEMENT OF THE DUTIES OF THE BUOY MASTER.

As the name indicates, the primary duty of this officer is to superintend this department of the service. He has to see to the efficiency of the buoys, their moorings and mooring chains, keeping up a requisite stock of spare ones for the renewal of those damaged, to replace those driving from their moorings; annually to renew the painting of them, and to shift the newly painted for those which have been exposed during the preceding year. To paint, when required, the beacons, and see to their being constantly kept in a proper state of repair.

To assist him in his duties there are depôts at Granton, Cromarty, Oban, Corran, and Campbeltown.

In these depôts the spare buoys and moorings for the respective districts are stored.

The Buoy Master keeps books showing the application of all the buoys, the repairs ordered and executed, and the disbursements which he has to make.

Independent of these duties the Buoy Master is called to report occasionally on applications for new buoys, to superintend their being placed, and to take the necessary bearings of their position.

He has also to assist annually in making up the estimate for the succeeding year's supply, to be submitted to the Board of Trade.

By order of the Board,
ALEXANDER CUNINGHAM
Edinburgh, 22d September 1859. Secretary.

XXII.
XXIII.

XXIV.

XXV.
XXVI.

CIRCULAR No. VI.

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

Applicable to coasts under the superintendence of the Commissioners of Northern Lighthouses.
Numbered on the same system as the Index Map Geographically from west, north, east—sunwise.

33.

I. William Marshall, Merchant and ship-owner, Garliestown, in the port of Wigtown.

II. WIGTOWN BAY.

III. There is no lights or buoys in Wigtown bay, there is none required so far as I know of.

IV. There is a light on the Little Ross near Kirkcudbright, which is of great service to vessels frequenting Wigtown bay.

V. I am not aware of any improvement required.

VI. The only place where a light might be erected would be the Burgh Head, a headland the entrance to Wigtown bay from Luce bay, but it is not much wanted.

II.

VIII. No.

X. None.

XI. A flag is hoisted at Garliestown pierhead when there is water in the harbour, if any vessels are in the offing.

XII. None.

XIII. None.

XIV. No.

XV. None.

XVI. None.

XVII. No reply to this.

XVIII. None.

Circular VI.

- 34.
- I. Capt. John McNeill, retired from sea.
 - II. ISLE of ARRAN, LAMLASH.
 - III. Northern Light Company.
 - IV. I consider they are good.
 - V. Pladda has two lights.
 - VI. No place.
 - VII. Oil.
 - VIII. None.
 - IX. None.
 - X. None.
 - XI. None wanted.
 - XII. None used, and not any wanted.
 - XIII. A red can buoy in the south entrance of Lamlash Harbour.
 - XIV. No.
 - XV. None paid.
 - XVI. I do not know of any.
 - XVII. I hear no complaints.
 - XVIII. No dues.
 - XIX. I know not.
 - XX. None.

35.

- I. William Watson, Jun. and Co., Agents for Lloyd's, Campbeltown, Argyleshire.
- II. CAMPBELTOWN, and ADJACENT COASTS.
- III. Northern Light Commissioners.
- IV. With few exceptions they are ; refer to No. VI.
- V. Present lights and beacons are efficient and well placed.
- VI. Would recommend a light to be placed on Quarry Point, to lead into harbour. Devaar light guides to the Loch, but after that is passed all is dark, and the channel narrow. This building could be erected at small cost, and lighted by town lamp-lighter, gas-pipes being already laid to within a few yards of proposed sight. Would recommend a beacon on reef at north-east point of Devaar island, and one on Smerby rocks, north side of entrance to harbour.
- VII. All lights on this coast are lighted with oil ; pier lamp with gas.
- VIII. The old harbour light was removed on Devaar light being built. Not aware of any accident having occurred in consequence.
- IX. The buoy at "Oterard" has been removed ; we understand on remonstrance from fishermen losing nets against it. We have known the buoy on Arranman's—barrels being shifted by gales of wind, but immediately reported by our local agent, and by us to Northern Light Commissioners, who lost no time in replacing, no accidents having occurred.
- X. Several accidents have occurred, generally from fog, but these we cannot fairly attribute to want of lights, buoys, or beacons.
- XI. The harbour is accessible at all times of tide, and no signals required.
- XII. No fog signals are used. We cannot suggest any apparently useful system.
- XIII. Buoys and beacons are coloured red or black ; of conical form and being entirely under control of buoy-master appointed by Northern Light Commissioners : we conclude are arranged on one system all round the coasts of Scotland.
- XIV. Buoys and beacons in this locality we consider to be well arranged.
- XV. No local dues are levied in such respect.
- XVI. No complaints so far as we are aware, unless our intimation of removal of a buoy by gale may be construed as such.
- XVII. Satisfactory, excepting remarks No. VI.
- XVIII. No complaints against light dues, except improper levy, for instance,—Sailing vessels and steamers trading betwixt Ayr and Campbeltown are charged for Sanda light which they cannot by any possibility see.
- XIX. No local dues except "quay dues" levied here, which have not been entirely applied to the purposes for which nominally levied.
- XX. General opinion in locality as to present management of lights, &c., is favourable.

36.

- I. John McIsaac, Harbour Master.
- II. CAMPBELTOWN, ARGYLESHIRE.
- III. Northern Light Commissioners.
- IV. There is little to improve, except a beacon was placed on Smerby rocks.
- V. If a beacon were placed on Smerby rocks it would be of great benefit to the port of Campbeltown.
- VI. An iron beacon of bar iron might with ease and utility be placed on Smerby rocks, as the rocks are dry at low water, and would be a guide for Otterard rock, which has only ten feet on it at low water, and is about three cables length south-east from Smerby rocks.
- VII. The island Davar light is from oil, the quay light from gas.
- VIII. The lighthouse that formerly led into the harbour was fixed at Kilkerran, but on the erection of the light on the island Devaar, was discontinued by order of the Commissioners of Northern Lights. It was found to be much wanted by vessels entering the harbour after dark, but no accident has occurred through the omission, only if restored and placed about 300 yards to the north-west would be of service as leading through the narrow channel.
- IX. The buoy on Otterard rock has been frequently carried away by gales, and for some years past discontinued, which shows the necessity of a beacon on Smerby rocks, for almost every winter some small craft is found on shore, although few are totally lost.
- X. Cannot state any accident that may be fairly attributed to want of buoys or beacons.
- XI. No tide signals needed, being a deep water harbour.
- XII. No fog signal used at the lighthouse.
- XIII. The buoys and beacons on the starboard hand are red, and on the port hand black in entering. The beacons are of sheet iron, in form of a cone, with ball on top ; the buoys are conical.
- XIV. Would not recommend any change.
- XV. The dues payable for Devaar Light is 6*d.* for 50 tons register, and an additional 6*d.* for every 50 tons. Wind-bound vessels pay neither lights nor dues.
- XVI. Not aware of complaint against light, buoy, or beacon in this locality.
- XVII. Mariners are satisfied generally with the lights, buoys, and beacons, except for Otterard or Smerby rock, which should be beaconed.
- XVIII. There is no complaint I hear of amongst mariners, the dues being much the same as other places on the coast.
- XIX. Cannot answer this question.—The general opinion satisfactory with regard to management of lights, buoys, and beacons.

37.

- I. John MacMillan, Bowmore, pilot in Lochindaal for the last 40 years, Dan McIntosh, Bowmore, pilot in Lochindaal upwards of 30 years.
- II. LOCHINDAAL, ISLAND of ISLAY.
- IV. Lochindaal is not lighted at all, though very much required, owing to a large number of vessels putting in for shelter ; in attempting to do so, many are lost from the want of a proper light and buoys.
- V. Would suggest that a large buoy should be placed on each side of the bar or entrance to the harbour, in order to be discovered, and to guide vessels to the proper anchorage.
- VI. We would recommend that a lighthouse should be erected at the north side of the entrance to Lochindaal, and east of the village of Port Charlotte, as that would enable the mariner entering Lochindaal, to get hold of the harbour light on losing the Rhuns Light, and enable him to come to a safe anchorage.
- IX. There are no buoys in Lochindaal.
- X. A large number of vessels have from time to time gone ashore on Laggen Bay, when making for Lochindaal, not being able to distinguish the one from the other at night, from the want of a harbour light.

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

- XIII. None.
 XV. None.
 -XVIII. We have often heard ship-masters complaining of the want of a harbour light, buoys, &c., in Loch-indaul, and stating that they would cheerfully pay harbour dues, were there a light to guide them to the anchorage.

- XV. There are no local dues.
 XVI. I am not aware whether any complaints have been made.
 XVII. The general feeling of the mariners is that the lights and buoys are efficient so far as they exist.
 XVIII. There are no local dues.
 XIX. None.
 XX. They are supposed to be well managed.

SCOTLAND.
 Circular VI.

38.

- I. A. MacKinnon, agent for Lloyd's, Corry by Broadford.
 II. From ARDNAMURCHAN to GAIRLOCH, including the ISLANDS of RUM, CANNA, MUCK, and EIG.
 III. The Commissioners of Northern Lighthouses.
 IV. Yes, with the exceptions under noted.
 V. I have been told by mariners that it is difficult to make out Isleornsay Harbour in a dark night, for want of a distinguishing light to show when they are clear of the north-east point of the island.
 VI. A buoy, I think, is wanted, or rather a beacon, on a rock called Skertarsin, at the north-east entrance to the sound of Rasay. A buoy on Boderg at the entrance of Loch Torridon; a large beacon on Linga Vor, at the entrance of Lochnagall Arisaig; a buoy on the reef at the north-east of Sand Island, at the entrance of Canna Harbour, and one on Skeirintrá, in the entrance to Lochnevis. My reasons are, that I have known accidents occur on all of these.

- VII. Oil.
 VIII. Not that I know of.
 IX. I have not.
 X. I have known accidents occur on all the rocks I have mentioned. Last year I had the wreck of the schooner Eulala on Skertarsin; and a few months ago that of a sloop, called the "Jessie," on the rock called Linga Vor.
 XI. None are used, nor do I consider them necessary.
 XII. None are used, and I hardly think they would be of any use.
 XIII. They are all coloured black on the port side and red upon the starboard side.
 XIV. No.
 XV. There are no local dues.
 XVI. I have never heard of any.
 XVII. The general feeling, I believe, is that the existing lights, buoys, and beacons are efficient.
 XVIII. There are no local dues.
 XIX. Answer to No. XVI. referred to.
 XX. They are considered to be well managed.

39.

- I. James Manson, Kyleakin, pilot in the Naval Surveying Service.
 II. From ARDNAMURCHAN to GAR LOCH, including the ISLANDS EIG, RUM, MUCK, and CANNA.
 III. Northern Lighthouse Commissioners.
 IV. Yes, with the exception after mentioned.
 V. I consider it requisite that a distinguishing light should be shown at the lighthouse at Isleornsay to show a person entering the harbour when he is clear of the north-east rock.
 VI. I would recommend a beacon on Sgeirtarsuinn at the north-east entrance of the Sound of Raasay; another large beacon upon Linga Mhor, at the entrance of Lochna Gaul Arisaig; a buoy on Boderg at the entrance of Loch Torridon, and one on the reef at the north-east of Sand Island, at the entrance of Canna Harbour, and one on Sgeir an T'sruth in the entrance to Lochnevis.
 VII. Oil in all.
 VIII. I am not aware of any.
 IX. I am not aware.
 X. I have known vessels go on shore on all the rocks on which I have recommended beacons or buoys to be placed.
 XI. None are used, and I do not think they are wanted because they are mentioned in all the charts lately published.
 XII. None are used, and I do not consider them necessary.
 XIII. Black on the port hand and red upon the starboard, according to the Admiralty directions.
 XIV. None.

40.

- I. Niel M'Donald, Tacksman, Kilbride, South Uist.
 II. CASTLE BAY, in BARRA.
 III. Commissioners of the Northern Lights.
 IV. Not well lighted or buoyed.
 V. No buoys or beacons in this locality.
 VI. Castle Bay, Barra, being the only harbour in Barra frequented by large vessels, I would recommend a beacon painted white on a rock in the entrance, and two buoys, one red and the other white, on other two sunk rocks in the harbour.
 VII. Colza oil.
 VIII. I am not aware.
 IX. I do not know.
 X. I am not aware of any.
 XI. No tide signals used.
 XII. No fog signals used.
 XIII. No buoys or beacons in this locality.
 XV. I am not aware to whom they are paid.
 XVI. I am not aware of any.
 XVII. A number of ship masters told me that the Ruhusinnish light was good for nothing; I never heard a complaint of the Barra Head light.
 XVIII. I am not aware of their feelings.
 XIX. I am not aware.
 XX. I am not aware.

41.

- I. Niel M'Donald, tacksman, Kilbride, South Uist.
 II. LOCHBOISDEL, in SOUTH UIST.
 III. Commissioners of the Northern Lights.
 IV. Not well lighted nor yet buoyed.
 V. Lochboisdell is a very fine harbour, and is very much frequented in winter by large vessels from the Baltic, and bound to different ports in England and Ireland. There are four dangerous half-tide rocks in the harbour of Lochboisdell, which should have been buoyed long ago with black and white buoys.
 VI. I would recommend a revolving bright light on the Island of Ornsay in South Uist, or on the Island of Firay, in Barra, to lead vessels in distress through the sound between Uist and Barra, from the westward; in the entrance of the sound from the eastward there is a large and capacious harbour called Otter Vore. If the sound was well buoyed, white and red, after a careful survey I am certain it would save an immense deal of life and property. In the year 1853 a large ship, called the "Annie Jean," with upwards of 500 passengers on board, was wrecked on Barra Island, and about the half of that number drowned, within three miles of the entrance of the Sound of Barra. In the year 1856 a large ship belonging to Hartlepool, called the "Hecla," Captain Moore, came through the sound with a ship of 900 tons register, at three-quarters flood, and only touched once; for I have been an eye-witness; large vessels that get too close to the shores of this island in bad weather and westerly winds it is almost impossible for them to work off or round Barra Head. For further explanation see W. Norris's Chart of the West Highlands.
 VII. Colza oil.
 VIII. I am not aware of any.
 IX. There were never any buoys laid down in this place that I am aware of.
 X. The schooner "Eward," of Leer, was wrecked here on the 24th November, 1859, and told me that he did not see a red light on Ruhusinnish, though he passed within a few miles of it; consequently his vessel was wrecked at five o'clock next morning, with a valuable cargo of linseed from Riga.

SCOTLAND.
Circular VI.

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

- XI. No tide signals used nor yet required.
XII. None used or yet required.
XIII. No buoys or beacons in this locality, though very much required.
XV. I am not aware.
XVI. I am not aware of any complaints.
XVII. A number of shipmasters told me that the Rubinnish Light was good for nothing, Captain Ellison of the brig "Cambyes," of South Shields, wrecked at Barra last year, told me that he was knocking about within a few miles of the light, and could not pick it up, and also Captain Kotting, of the schooner "Edwin," of Lea, told me the same.
XVIII. I am not aware of their feelings regarding the dues.
XIX. I do not know.
XX. I am not aware.

42.

- I. Alexander Macdonald, Ballranauld, North Uist, by Lochmaddy, agent to Lloyds.
II. LOCHMADDY ISLAND OF NORTH UIST, INVERNESS-SHIRE, N.B.
III. There is none at present.
IV. There are neither buoys nor beacons at Lochmaddy, and no lighthouse nearer than Glass light, on the south coast of Harris, 22 miles east-north-east, and Rhu-Ushinish light on the south-east coast of South Uist, about 20 miles south-west by south by compass from the entrance of this harbour.
V. In absence of a harbour light, a beacon of masonry, and one buoy, would be very serviceable.
VI. I would recommend a harbour light to be erected on the south point of the entrance, and a buoy on the edge of the shoal lying off the north-east side of the Reele group of islands, for the following reasons, viz., there is such a sameness in the coasts on both sides of the entrance, that it is difficult to make it out in a dark night or in thick weather; that it has been the mail packet station for upwards of 50 years, and is now a good deal frequented by steamers and other trading vessels, which must lie to off the entrance in dark nights for daylight; besides, it is a harbour where any sized vessel can find shelter in.
VII. No lights nearer than those mentioned in No. IV.
VIII. I know of none.
IX. I do not know of any.
X. I know of several shipwrecks and loss of life on the north-west coast of North Uist, entirely owing to the want of a lighthouse on that part of the coast.
XI. None required here.
XII. If there was a lighthouse, a fog signal would be of service, but otherwise it could not be attended to.
XIII. There are none.
XIV. No buoys.
XV. No local dues.
XVI. I do not know of any.
XVII. It has been the opinion of many shipmasters, frequenting the port, that a harbour light was very much required.
XVIII. No local dues paid here.
XIX. No local dues collected.
XX. I heard no complaints against the management of any of the lighthouses I have already mentioned.

43

- I. W. and R. Morison, merchants, and agents to Lloyd's, Stornoway.
II. STORNOWAY.
III. The only light is on Arinish Point, where there is also a beacon, both erected by the Commissioners for Northern Lights, and under their control.
IV. No.
V. The light on Arinish Point is so low, that in hazy weather it cannot be seen above three miles seaward, and then only a mere flash, the space for exhibition being too contracted, and the revolution too quick; this being a fine harbour, and much frequented, the light should be more elevated and improved.

- VI. There should be beacons on a rock in Sandwick Bay, and on a reef inside of Arinish Point; also on a ledge outside of Holm Point, being all half-tide rocks, and in the tract of ships entering and leaving the harbour with adverse winds. (See Captain Otter's charts.) There is also a buoy or beacon required on Skrivon, a rock near the centre of Broadbay, where several vessels have been wrecked.
VII. Colza oil.
VIII. We are not aware.
IX. The buoy on Skerinoe, off Glass, L. H., was twice washed away, but replaced as soon as possible, and in the interim a schooner (the Lawrence O'Connor Doyle) was totally wrecked on it.
X. Several vessels have struck, of late years, on the rocks described in question 6; one so late as the 5th November 1859; the "Frederick Wilhelmine," of Danzig, struck on the reef inside Arinish Point.
XI. No tide signals required, as there is sufficient depth of water at all stages of the tide.
XII. We are not subject to fogs.
XIII. There is only one iron beacon off Arinish Light, black, with white top, of a conical form, on which a light reflects at night, from the east base of the tower.
XIV. No.
XV. No local dues, except the usual charge for Arinish, as one of the Northern Lights, and a small tonnage rate on vessels using the quays.
XVI. We have heard no complaints.
XVII. Mariners complain of the Arinish Light being too low, and the want of beacons as specified in question VI.
XVIII. We have heard no complaints.
XIX. The small amount collected for quayage is expended for keeping the quays in repair.—11th Jan., 1860.

44.

- I. Dugald Graham, master, Clansman Steamer, of Glasgow.
II. STORNOWAY HARBOUR, ISLAND OF LEWIS.
III. The Northern Lighthouse Commissioners.
IV. No, not sufficiently.
V. Two beacons are required for the harbour, one upon the reef in Sandwick Bay, and one upon the Packet Rocks. The lighthouse upon Arinish Point is not of sufficient elevation; the light is not half powerful enough and the flash is too short; I often was within two and a half to three miles of it before I could pick it up.
VI. I have already referred to the harbour of Stornoway in No. V. The Raven Rock entrance of the Glen d'hu, Sutherlandshire, the Sgeir Tarsuain, off Scalpa Island, near Portree, and the entrance of Loch Carron, require beacons; a considerable traffic is in each locality at the fishing season; besides the regular trading of the steamers upon the coast, these are the most important. Several other localities are also needful of buoys and beacons, but not so much as those stated.
VII. Whale oil.
VIII. No, not aware.
IX. Most of the buoys get adrift from time to time in winter season; I do not, however, know of any accident in consequence.
X. A schooner was lost upon Sgeir Tarsuain, above referred to, a year ago, besides many narrow escapes from them all.
XI. None used, and not wanted.
XII. Not used, nor required.
XIII. There are none used.
XVI. Several representations have been made to the Northern Light Commissioners about the lighthouse on Arinish Point, and the beacons referred to have also been recommended; no result.
XVII. Very dissatisfied with the efficiency of the light, and the want of the beacons referred to in particular.

45.

- I. Magnus Lyon, Strommess, master of "Royal Mail" Steam Post Office Packet to Thurso.
II. HOY, WALLS, and PENTLAND FIRTH, West.

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

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- III. Northern Lighthouse Commissioners.
- IV. No.
- V. Nil.
- VI. Little Holhorn Head, Caithness Lights, bearing north-east and south-west, and a red light on Rora Head, Ruckwick, Hoy, Orkney.
- VII. Vegetable oil.
- VIII. No.
- IX. No.
- X. The Glasgow packet of Wick, I. Leith, master, grounded on the lower western point of the outer Holm of Stromness, on the 12th December current.
- XI. Nil.
- XII. A gong on the west lighthouse, Hoy Sound, would be useful in dark and foggy weather.
- XIII. Black on the port, and red on the starboard sides; form, nun and flat buoys.
- XIV. Black is preferred, being best seen.
- XV. None.
- XVI. None worth notice.
- XVII. Good.
- XVIII. None.
- XIX. None.
- XX. Nothing particular.—16th January, 1860.

46.

- I. Jno. Robertson, Stromness, agent to Lloyd's, &c.
- II. The WEST and SOUTH COAST and MAINLAND of ORKNEY, with the ISLAND ADJACENT THERETO.
- III. Commissioners of Northern Lights.
- IV. No.
- V. Nil.
- VI. A small iron beacon on the west point of the outer holm of Cairston; buoy on the outer point of the bank, sheltering Cairston Roads; a buoy on the rock on the west side of Scapa Bay; buoy on Lippa Rock, Watersound; and buoy and beacon on St. Margaret's Hope, St. Roland's Bay, see Mr. Lycris's report.
- VII. Oil.
- VIII. Not that I am aware of.
- IX. Lippa Rock Buoy was taken away some years ago, and various accidents have occurred in Watersound and St. Margaret's Hope.
- X. The Ina, Arthur, of Sunderland, from Quebec, struck on the bank east of Cairston Roads on the 16th December 1858, and filled with water. Various ships have grounded on the same shoal, and within the harbour for want of a beacon on the holm.
- XI. No tide signals, but much needed on Grinner's Head, Southern Wray, particularly fog signals, during the herring fishing season.
- XII. None.
- XIII. The beacon on Neva Holm is red, as also the one in Skerry Sound; the buoys are red port side, and black starboard side; chequered buoy on the Grinds, when the passage is any side.
- XIV. No.
- XV. None.
- XVI. When made they have generally been answered favourably.
- XVII. Pretty good feeling of late years.
- XVIII. Not to my knowledge.
- XIX. None collected.
- XX. Nothing particularly; generally satisfactory.—17th January 1860.

47.

- I. Wm. Cromarty, J. P., Merchant, St. Margaret's Hope, Orkney.
- II. More particularly ST. MARGARET'S HOPE and WATER SOUND.
- IV. No.
- V. A metallic beacon, instead of an old stick placed on a reef at the entrance to St. Margaret's Hope, and a buoy on a sunken rock called Scovil Flæes, on the opposite side of the entrance.

- VI. A buoy on the rock called Lippa, lying in the entrance to Water Sound; this buoy would require to be of considerable size, as the tide runs strong in this sound, and I think the colour should be black.
- XV. No dues levied here.
- XVII. What I have described in the foregoing is generally thought by the seafaring class frequenting this port as a desideratum.

48.

- I. S. P. Lanth, deputy agent for Lloyd's, St. Margaret's Hope, Orkney.
- II. ST. MARGARET'S HOPE, WATER SOUND, WIDEWALL BAY, PAN HOPE, and HOLM SOUND.
- III. Commissioners of Lights.
- IV. No.
- V. None.
- VI. A buoy on Lippa Rock, in Water Sound; a buoy on the shoal lying in the bay of St. Margaret's Hope, called Scovil Flæes; a metallic beacon on the reef shoal lying on the west side of St. Margaret's Hope entrance, and a light on Grimness Head. Vessels frequently go on the above shoals, and the want of a light is much felt for vessels taking Holm and Water sound, as also for herring boats during the fishing season.
- VII. Oil.
- VIII. None.
- IX. Lippa Rock buoy was removed; said to have run down by the tide (which was not the fact). A petition was sent to the Commissioners of Northern Lights, on 30th May, 1855, for the replacement of the Lippa Rock Buoy, as also for a light on Grimness Head.
- X. A number of vessels have run on Lippa Rock for want of the buoy; vessels taking the harbour of St. Margaret's Hope go on the shoals there.
- XI. None.
- XII. No fog signals are here; a gun on Grimness Head to be used during the herring fishery season, say from 12th July to 20th September, to guide vessels and boats employed in said fishing would be a great boon to the fishermen of the Isles of Orkney, as fogs are prevalent during the above time, and boats frequently find themselves in Pentland Firth, when they often lose their drift of nets, for want of a signal to Watersound. Neva Skerry beacon is a metallic common black. Grinds buoy, chequered white and black; Holm Sound beacon, metallic, pillar red. "Cubsay buoy," Holm Sound, black.
- XIV. None.
- XV. No local dues.
- XVI. Vide No. IX.
- XVII. Inefficient.
- XVIII. None.
- XIX. Nil.
- XX. Generally satisfactory.

49.

- I. A. Sutherland, Lloyd's agent for Shetland.
- II. The SHETLAND ISLANDS.
- III. Commissioners of Northern Lights.
- IV. The east coast of Shetland is now well lighted, but on the whole west coast there are none, and to my certain knowledge ships and lines are lost for want of a light—say on the Vee Skerries. Many buoys are required on the east coast from Lerwick to Yell Sound on sunk rocks, say one on the Soldian rock two miles north-east from Brenna; one on the Unicorn at the entrance of Catfirth Voe; one in Yell Sound on a sunk rock called Yell's Baa, near by the Island of Urfacy; one in the north entrance to Lerwick near by Rovey Head; one on the Havre du Grind sunk rocks, three miles south-east from Foula. A vessel from Archangel was lost on this rock a few years since, and no doubt others are lost in

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- it which are never heard of, as many anchors and chains have been seen on the Havre du Grind sunk rock, and also about the Vee Skerries; the latter are partly above the surface.
- VI. A buoy should be placed near the south entrance to Lerwick on a shoal called the Baa of Twagoes. A buoy should also be placed on a sunk rock about half a mile north from the Green Holm, three miles from the north entrance to Lerwick.
- VIII. I am not aware of any such occurrence.
- IX. There are only two buoys laid down on the whole coast of Shetland, and those are in the harbour of Lerwick, sometimes accidents did occur formerly, but none since these two were placed. These two buoys have been placed by the Commissioners of the Northern Lights.
- X. I may state without any doubt that many accidents have occurred principally on the west coast for want of a light. Two vessels were, not long since, lost with their crews, viz., the "True Blue" of Glasgow, and "Charles Jones" of London, both of which might have been saved had there been but one light to direct them.
- XI. I do not think tide signals are required on this coast.
- XII. There never were any fog signals used on any part of Shetland; perhaps at times they might be of use.
- XIII. Black, form round, one of which is placed on a rock, the outer on a shoal about a quarter of a mile distant from each other.
- XIV. I am not aware they require any alteration.
- XV. There are dues chargeable here for lights, paid to the collector of customs at the same rates as at any other part of the kingdom.
- XVI. I am not aware of any.
- XVII. The general feeling of mariners frequenting the port of Lerwick is very good, and since the erection of a light recently on the south end of Bressa, this harbour can now be approached by day or night free of danger.
- XVIII. There are no local dues.
- XIX. No local dues.
- XX. I am not aware of any in particular, as far as regards lights. My own opinion is, that it would be of the greatest importance to have a light on Fair Isle, situated 'twixt the Orkneys and Shetland about half way.
-
- I. Joseph Leask, merchant, Lerwick, Shetland.
- II. PORT of LERWICK, and the SHETLAND ISLANDS generally.
- III. Commissioners of Northern Lights.
- IV. Lerwick harbour and the east coast is now very well lighted, but there are several sunk rocks off the north entrance of Lerwick harbour requiring buoys. See No. VI.
- VI. A light is much required on the Vee Skerries, lying a few miles to the westward of Papa. There are no lights on the west coast. The Vee Skerries is a very dangerous reef of rocks. There are several sunk rocks off the north entrance to Lerwick harbour on which buoys should be placed, namely, the Soldian, Nimbans, off the east side of Rossary, and one on a sunk rock near Rovey Head, in the north entrance, also on the Unicorn rock off the entrance to Catfirth Voe. A buoy or beacon would be necessary on the Havre du Grind rocks, three miles south-east of Foulas. A beacon is also necessary on the Rumble Skerries in Yell Sound.
- VII. Oil.
- VIII. I am not aware of any such occurrence.
- IX. There are only two buoys laid down on the whole coast, and they are in Lerwick harbour; previous to their being laid down some accidents did occur. The buoys have not been displaced since they were laid down.
- X. A vessel from Archangel was wrecked on the Havre du Grand rocks a few years ago, which might not have taken place had there been a light on the Vee Skerries.
- XI. There are none, and none required.
- XII. There are none, and do not think they are required.

50.

- XIII. The colour of the buoys in Lerwick harbour are black; one is laid on a rock and the other on a shoal.
- XIV. No.
- XV. There are no local dues levied on shipping.
- XVI. I have not heard of any complaint.
- XVII. Since the light was placed recently on the south end of Brassay, the entrance to our harbour, the mariners are generally well satisfied with the lights on the south-east side of the islands.
- XVIII. There are no causes of complaint, there being no local dues charged.
- XIX. No local dues.
- XX. I have not heard of any complaint on the management of the coast lights by the Commissioners of Northern Lights.

51.

- I. James Hoseason, Merchant, Mosshank, Shetland.
- II. To the SHETLAND ISLANDS generally.
- III. Commissioners of Northern Lights, I believe.
- IV. No.
- V. It would be almost impossible to light and buoy every part of the Shetland islands, as they would require to render their navigation safe to strangers; for them most particularly required refer to No. VI.
- VI. I would recommend a light to be placed on the Vee Skerries, near Hillswick; there are at present a light on each end of the group, and one on the east side, but the west side is quite unlighted; a light on the Vee Skerries would in a great measure supply that desideratum. I would also recommend a beacon to be placed on each of the Rumble Skerries in Yell Sound. Yell Sound is the usual passage through the islands from the German ocean to the Atlantic and vice versa, and with easterly winds much used by the Greenland fleet on their outward passage, and the Rumble Skerries are two very dangerous half-tide rocks right in the middle of it.
- VII. I do not know.
- VIII. I am not aware of any such.
- IX. There are no buoys in Shetland except two in Lerwick harbour, and only recently laid down.
- XI. I understand that Greenland vessels have occasionally grounded on the Rumbles, but I am not sufficiently informed to give names or dates of the numerous wrecks on our islands. There is little doubt many are attributable to the want of lights, two of the three coast lights have only been recently lighted.
- XI. There are none, and none required.
- XII. There are none, and could be of no service.
- XIII. Refer to No. VIII.
- XIV. Refer to No. VIII. I am not aware that they require any alteration.
- XV. I do not know whether any for the lights recently erected; for buoys or beacons none.
- XVI. In an answer to former queries, and have already pointed out the desirability of a light on Vee Skerries, and beacons on the Rumble Skerries.
- XVII. I think it is what I have expressed in these answers.
- XVIII. Light dues have recently been exacted from our fishing vessels prosecuting the fishery on the coast and banks of Faro, and as the light under the charge of the Northern Light Commissioners can be of little or no service to them, dissatisfaction has been expressed. I am ignorant, however, whether these dues have been charged for the northern lights generally, or for the two lights recently erected on our coast, but all are equally useless to the fishing vessels at or near the coasts of Faro.
- XIX. Refer to XVIII.
- XX. I am not aware of any general opinion other than that our fishing vessels, which, generally without seeing or being near a British light, proceed direct to the Faro islands, and then prosecute the fishery for one or two months at once, and return without the aid of any benefit from said lights, should not be charged.

EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

52.

- I. William Watson, ship agent, Cromarty, agent for Lloyd's, Cromarty district.
- II. PORT of CROMARTY, MORAY FIRTH, CROMARTY and INVERNESS FIRTHS.
- III. Commissioners of Northern Lights; Alexander Cunningham, Esq., Secretary, residing in Edinburgh.
- IV. Most certainly, with the exception of a buoy wanted on the bank, described in answer to Query VI. on this paper.
- V. The lighthouse stands about 100 yards above high-water mark, in consequence of which, vessels are frequently aground, on a sand bank, about a quarter of a mile lower down, which a buoy placed on it would remedy.
- VI. On the sandbank referred to in answers to query Nos. IV, and V, on this paper, bearing E.N.E., about a quarter of a mile lower down the firth than lighthouse.
- VII. Colza oil used in lighthouse.
- VIII. Never; the lights being well attended to all along the coast.
- IX. The buoys are never displaced in this firth. The Commissioners of Northern Lights have them overhauled, painted and securely anchored anew every twelve months.
- X. None whatever in this locality.
- XI. No tide signals of any kind used in our harbour. A tide signal would be most advantageous at the harbour of Cromarty. A light by night, and a flag or black ball by day.
- XII. No fog signals used in this locality.
- XIII. The buoys are all red on starboard side going up the firth, and black on the port side, form of a sugar loaf, arranged as stated before.
- XIV. No; they suit very well as at present.
- XV. Yes; by officer of customs, and paid over to the Commissioners of Northern Lights.
- XVI. No complaints.
- XVII. Perfectly satisfied.
- XVIII. Quite satisfactory; I hear no complaints.
- XIX. Most certainly.
- XX. The general opinion is that the management is admirable, and can scarcely be improved upon.—22d December, 1859.

53.

- I. James Geddie, shipbuilder, Kingston, Speymouth.
- II. SPEYMOOUTH.
- III. None.
- IV. There are neither light, buoy, nor beacon within eight miles of this port.
- V. None.
- VI. Our pilots use tide signals occasionally, but they would not answer to be stationary, as the channel shifts so very often, owing to the strong current of the river and the great quantity of loose shingle at its mouth.
- XIII. Our pilots use small buoys, but have occasion to shift them very often, as occasion requires them by the shifting of the shingle.
- XV. None.
- XVI. None.
- XVII. Never heard any remarks made.
- XVIII. Never heard any complaints.
- XIX. As far as ever I heard.
- XX. Never heard any complaints.

54.

- I. John Stephen, seal and whale ship "Milenka," FRASERBURGH—shipmaster.
- IV. No.
- V. I consider that Rattray Head is the most dangerous headland on the whole east coast of Scotland, being very low, and the shore light sand, makes it scarcely perceptible at night, especially in moon-light nights; and also that it has very dangerous reefs laying seaward of it, one in particular to the south-east, which extends $1\frac{1}{2}$ miles from high-water mark, and I consider it necessary that a large nun buoy should be laid down in six fathoms at low water, on the outer end of this reef, and also that Kinnairds Head and Buchan Ness light should be so arranged as to make this head passed in greater safety, such as Buchan Ness light masked shore ward to the line of the

buoy on the said reef, and also Kinnaird's Head, and then it to show up a red light between the line of the buoy on Rattray Brig, and until Carinbulg Brigs were passed, and the light to appear in the same colour as it is at present. There is a large iron beacon on Carinbulg Brigs, lately put on, which is of very great service.

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- VI. I may also state, that a buoy would be of very great service on the outer part of the reef of rocks which lies about one mile of Scoteston Head; it is also very dangerous, and wrecks often occur upon it.
- VII. The light on Kinnaird's Head is from oil. The leading lights at the harbour of Fraserburgh are from gas, but would recommend them to be much larger, as they are a safe guide to vessels passing Carinbulg Brigs.
- X. It is my opinion that much life and property have been lost on these headlands, which would in all likelihood have been saved had the lights, &c. been arranged as above.
- XI. There are no tide signals used at this port, and I consider there should be, and shown at two-thirds flood by ball or flag by day, and a green light by night.
- XII. There are no fog signals used here, but they would be of the greatest importance at this port, especially in the fishing season.
- XIII. There are no buoys about this port but one, and it is very often adrift and on shore, from which great inconvenience is found. For the safety of the navigation of this port, I consider it necessary that a nun buoy should be placed at the north side of the channel, on the outer side of the outer lush, and another on the south side of the channel, on the bush of the beach.
- XVII. The general feeling of seafaring people here is as stated at No. XIII.

55.

- I. John Park, shipowner, Fraserburgh.
- II. FRASERBURGH.
- IV. No.
- V. A large nun buoy should be placed on the outer end of the reef of rocks at Rattray Head.
- VI. Because the reef at Rattray Head extends $1\frac{1}{2}$ miles seaward, and is very dangerous.
- VII. The light on Kinnaird's Head is from oil; the harbour lights are from gas.
- X. There have been many wrecks on Rattray Head, no doubt several have taken place from want of a buoy and proper lights.
- XI. There are no tide signals at this port; a flag was hoisted for a short time at half flood, but it has been given up, which I consider very improper; a flag or ball ought to be hoisted at half flood.
- XII. None.
- XIII. Only one buoy, and it is sometimes adrift; two buoys should be laid down, one to the north, and the other at the south entrance of the channel.

56.

- I. I. J. and T. Kirkwood, merchants and agents for Lloyd's.
- II. DUNBAR and ADJACENT COAST.
- IV. We do not think this coast is sufficiently lighted.
- VI. Goatness Point, about three miles south-east from Dunbar, because a very large proportion of the wrecks which occur in our district, which extends from St. Abb's Head to Gullan Ness, happens in that neighbourhood. In our opinion this is caused by the chain of the Lammermoor Hills, which commences at St. Abb's Head, and recedes inland to a distance of several miles from this Point, being mistaken for the line of coast, the intervening country being flat, and the point itself very low, are not observable from sea at night.
- VII. Oil.
- VIII. We are not aware that such has ever happened.
- IX. There are no buoys on this coast.
- X. See our answer to No. VI.
- XI. There are none, and we do not think they are required here.
- XII. None, and not required.
- XIII. There are none.
- XV. None.
- XVII. Similar to our answer to No. VI.

SCOTLAND.

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EVIDENCE COLLECTED THROUGH LLOYD'S AGENTS.

57.

- I. John Spence, merchant, Dunnet, Thurso.
- II. PENTLAND FIRTH DISTRICT.
- III. Commissioners of Northern Lights.
- IV. I do consider them well lighted. There are no buoys, nor, as far as I am aware, occasion for any.
- V. I cannot suggest any improvement in these respects.
- VI. See V.
- VII. I am informed the combustible in use at Dunnet Head is Colza oil.
- VIII. I am not aware of any such occurrence.
- IX. No buoys. See IV.
- X. I am not aware of any such subsequently to the erection of a beacon on the Skerry of Stroma, which took place about two years ago.
- XI. There are no tide signals used, nor in the circumstances of the locality do any appear necessary.
- XII. There are no fog signals used, and, owing to the rapid tides, I do not see that they could be of great use.
- XIII. There is but one beacon—that on the Skerry of Stroma, which is of a pyramidal form painted red.
- XIV. I consider the form and colour good, and do not think any change would be of advantage.
- XV. There are no local dues.
- XVI. I am not aware of any.
- XVII. The general feeling appears to be that these arrangements are the best possible in the circumstances.
- XVIII. No local dues. See XV.
- XIX. See above.
- XX. The general opinion appears to be favourable.

57.

- I. James Calder, shipmaster, Ratter, Dunnet, Thurso.
- II. PENTLAND FIRTH DISTRICT.
- III. Commissioners of Northern Lights.
- IV. I do consider them well lighted. There are no buoys nor, as far as I am aware, occasion for any.
- V. I cannot suggest any improvement in these respects.
- VI. See V.
- VII. I am informed the combustible in use at Dunnet Head is Colza oil.
- VIII. I am not aware of any such occurrence.
- IX. No buoys. See IV.
- X. I am not aware of any such subsequently to the erection of a beacon on the Skerry of Stroma, which took place about two years ago.
- XI. There are no tide signals used, nor in the circumstances of the locality do any appear necessary.
- XII. There are no fog signals used, and owing to the rapid tides, I do not see that they could be of great use.
- XIII. There is but one beacon, that on the Skerry of Stroma, which is of a pyramidal form, painted red.
- XIV. I consider the form and colour good, and do not think any change would be of advantage.
- XV. There are no local dues.
- XVI. I am not aware of any.
- XVII. The general feeling appears to be that these arrangements are the best possible in the circumstances.
- XVIII. No local dues. See XV.
- XIX. See above.
- XX. The general opinion appears to be quite favourable.

The numbers in the margin correspond with the numbers of the Questions in Circular I.

IRELAND.

CIRCULAR I.—CONSTITUTION OF GENERAL AUTHORITIES, &C.,
INCLUDING
OFFICE STAFF, GENERAL BUSINESS, EXPENDITURE, &C.

BALLAST BOARD, DUBLIN.

I. NUMBER OF DAYS OF ATTENDANCE OF MEMBERS, AND THEIR DATES, IN 1857 AND 1858.

THOMAS CROSTHWAIT, Esq., J.P.,

President of the Chamber of Commerce, Director of the Bank of Ireland; appointed 1820=33 Years a Member.

—	1857.	Total.	1858.	Total.
January	8, 9, 13, 16, 23	5	14, 21	2
February	5, 6, 12, 13, 19, 20, 26, 27	8	4, 11, 18, 25	4
March	5, 6, 12, 13, 19, 20, 26	7	4, 11, 18	3
April	2, 3, 6, 9, 16, 23, 24	7	15, 22	2
			19th and 20th April 1858 in London, waiting on Board of Trade relative to a steamer.	
May	1, 7, 8, 14, 15, 21, 22, 28, 29	9	6, 13, 20, 27	4
June	4, 5, 12, 19, 25, 26	5	3, 10, 17, 24	4
July	9, 10, 17, 23, 24, 31	6	1, 8, 15, 22, 29, 30	6
August	6, 7	2	5, 6, 12, 19	4
September	4, 10, 24, 25	4	9, 16, 23, 30	4
October	1, 2, 8, 9, 13, 16, 22	7	7, 14, 15, 21, 28	5
November	13, 19, 26, 27	4	4, 11, 12, 18, 25	5
December	3, 4, 10, 11, 24	5	5, 12, 23	3
		69		46

GEORGE FREDERICK BROOKE, Esq.,

Director of the Bank of Ireland, Merchant; appointed 1829=39 Years a Member.

—	1857.	Total.	1858.	Total.
February	27	1	25	1
March	19	1	2, 25	2
June	19	1	19	2
July			1, 22, 29, 30	4
October			1	1
December	24	1	23	1
		4		9

GEORGE ROE, Esq., J.P., D.L.,

Alderman of the City of Dublin; appointed 1830=29 Years a Member.

—	1857.	Total.	1858.	Total.
January	2, 8, 9, 15, 16, 23, 29	7	8, 14, 22, 28, 29	5
February	5, 6, 13	3	11, 25, 26	3
March	5, 19, 27	3	18, 19, 25, 26	4
April	2, 6, 9, 16, 30	5	1, 9, 15, 23	4
May	21, 28	2	6, 7, 21, 27	4
			From the 5th to the 20th May 1857 Mr. Roe was engaged with Committee inspecting the lights, &c. round the coast.	
June	5, 18, 25	3	3, 18, 24, 25	4
July	3, 10, 17, 23, 24, 30, 31	7	1, 2, 9, 16, 22, 23, 29, 30	8
			On the 8th, 9th, and 10th (inel.) July 1857 Mr. Roe was engaged on lighthouse business in London.	
August	14, 29, 21, 27, 28	5	27	1
September			2, 3, 24	3
October			1, 7, 13, 21, 22, 28	6
November			1, 11, 19, 26	4
December	24	1	3, 11, 16, 21	4
		36		50

CHARLES HALIDAY, Esq., J.P.,

Governor of the Bank of Ireland, &c., Merchant; appointed 1833=26 Years a Member.

—	1857.	Total.	1858.	Total.
January	9, 15, 23	3	1, 29	2
February	20	1	4, 12, 18, 25	4
March	12	1	5, 19	2
April	2, 3, 16, 24	4	1, 10	2
May	7, 8, 21, 28, 29	5	14, 19, 28	3
June	4, 11, 12, 25	4	11	1
July	3, 24, 31	3	9, 16	2
August	18, 7, 29, 21, 27, 28	6	6, 13, 18, 20, 26	5
September	4, 11, 24, 25	4	2, 10, 23, 30	4
October	15, 16, 22	3	7	1
November	6, 13, 19, 20	4	11, 18, 23	3
December	4, 11, 18, 24	4	24, 30	2
		42		31

COLONEL LA TOUCHE, of the City of Dublin Regiment of Militia, J.P., D.L.,

Banker; appointed 1833=26 Years a Member.

—	1857.	Total.	1858.	Total.
January	15, 16	2		—
February	5, 12, 13, 19	4		—
March			11, 25	2
April	9, 16, 24, 30	4	1, 22	2
May	28	1		—
			From the 5th to the 20th May (inclusive) 1857 on inspection of lighthouses.	
June	4, 11, 25	3		—
July	2, 10, 23	3		—
August	6, 27	2		—
September	17	1		—
			Colonel La Touche has been on active duty with his regiment since September 1857.	
November			25	1
December			2	1
		20		6

Sir JOHN KINGSTON JAMES, Bart., J.P., D.L.,

Merchant, a Director of the City of Dublin Steam Packet Company, Director of the Bank of Ireland; appointed 1842=17 Years a Member.

—	1857.	Total.	1858.	Total.
January	8, 9, 29	3	21, 29	2
February	3, 26	2	4, 11, 12, 18, 25, 26	6
March	19, 27	2	18, 19	2
April	2, 3, 6, 9, 30	5	8, 16, 29	3
May	22	1	6, 7, 13, 19, 20	5
June	25, 26	2		—
July	23, 24	2	8, 15, 16, 30	4
August			5, 13, 18, 19, 26	5
September	3, 17, 18	3	2, 10, 23	3
October	23	1	7	—
November	6, 13	2	23	1
December	3, 24	2	10, 17, 23	3
		25		33

GEORGE ALEXANDER HAMILTON, Esq., M.P.,

Assistant Secretary to the Treasury, late Member of Parliament for Trinity College, Dublin; appointed 1845=16 Years a Member.

—	1857.	Total.	1858.	Total.
January	23	1	21, 22	2
April			1	1
			Mr. Hamilton accompanied the Committee which waited on the Board of Trade in July 1857.	
August	28	1		—
December			30	1
		2		4

GEORGE PIM, Esq., J.P.,

Director of the Great Southern and Western Railway Company; appointed 1845=16 Years a Member.

—	1857.	Total.	1858.	Total.
January	9, 16, 30	3	21	1
February	20	1	25, 26	2
March	19	1	18, 19, 26	3
May	15, 22	2		—
June			25	1
July	24	1	2, 16, 29	3
August	14	1		—
September			30	1
October	22, 23	2		—
November	5	1		—
December	19, 24	2	24	1
		14		12

IRELAND.

Circular I. Questions I. to VIII.

IRELAND.

I. to VIII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

I. to VIII.

Circular I. Questions I. to VIII.

Sir JAMES DORMEIN,
Formerly of Royal Navy, and late Inspector-General of Coast Guard
Ireland: appointed 1848 = 11 years a Member.

—	1857.	Total.	1858.	Total.
January	1, 2, 3, 8, 9, 16, 22, 29, 30.	9	7, 8, 14, 15, 21, 22, 28, 29.	8
February	5, 6, 12, 19, 20, 26	6	4, 18, 19, 23	4
March	5, 6, 19, 27	4	2, 4, 11, 12, 18, 19	6
April	3, 6, 9, 16, 24, 30	6	1, 8, 15, 16, 23	5
May	1, 21, 28, 29	4	19, 20, 27	3
June	4, 5	2	Engaged on inspection of the lighthouses, &c. round the coast, from the 5th to the 20th May 1857, and from the 4th to the 15th May 1858.	—
July	17, 23, 24, 30	4	—	—
August	6, 7, 20	3	18, 24, 25	3
September	3, 4	2	18, 9th, and 10th of July (inclusive) with Committee in London waiting on Board of Trade.	—
October	1, 8, 15, 16, 17, 22, 23, 24, 29, 30.	10	From the 10th to the 28th of September 1857 engaged on inspection of the Irish lighthouses, &c.	3
November	12, 19, 20, 26, 27	5	4, 5, 11, 12, 15, 18, 19.	8
December	3, 4, 24, 31	4	2, 3, 10, 23, 24, 30, 31.	7
		59		45

MICHAEL STAUNTON, Esq.,
Collector-General of Taxes. Represented the City Corporation at the Board, as Alderman or Lord Mayor, from 1st January 1846 to 1859; appointed a Life Member 1850 = 9 years a Member.

—	1857.	Total.	1858.	Total.
January	2, 10, 23, 30	4	7, 8, 22, 28, 29	5
February	9, 6, 13, 27	4	18, 25	2
March	6, 12, 26, 27	4	2, 5, 11, 18, 19, 24, 25	6
April	2, 3, 16, 25, 24	5	1, 9, 15, 23	4
May	1, 7, 8, 14, 15, 23, 28, 29	8	6, 7, 21, 27	4
June	4, 20	2	3, 18, 24, 25	4
July	2, 3, 10, 17	4	1, 8, 9, 15, 16, 22, 30	7
August	6, 14, 20, 31, 28	5	5, 6, 27	2
September	4, 10, 11, 24	4	4, 3, 16, 17, 23, 24, 30	6
October	1, 4, 15, 24, 29	5	7, 14, 28, 29	4
November	5, 6, 13, 20	4	1, 5, 15, 18, 19, 25	6
December	3, 17, 18, 24	4	2, 3, 10, 23, 24, 30, 31.	7
		53		60

ROBERT CALLWELL, Esq.,
Merchant; appointed 1850 = 9 years a Member.

—	1857.	Total.	1858.	Total.
January	1, 2, 3, 9, 15, 10, 22, 29	8	1, 7, 14, 15, 21, 22, 29	7
February	5, 6, 12, 13, 19, 20	6	4, 5, 11, 12, 18, 25	6
March	5, 6, 12, 13, 19, 20, 26	6	2, 4, 5, 11, 12	5
April	2, 3, 9, 16, 23, 24	6	30	1
May	1, 21, 22, 28, 29	5	19, 20, 27, 28	4
June	4, 5, 12, 18, 19, 25, 26	7	Engaged on inspection of the lighthouses, &c. round the coast, from the 5th to the 20th May 1857 and from the 4th to the 15th May 1858.	—
July	3, 9, 10, 16	4	3, 4, 10, 11, 17, 18, 24	7
August	6, 7, 15, 14, 20, 21, 27, 28.	8	1, 2, 8, 9, 22, 23, 29, 30	8
September	3, 4, 10	3	5, 12, 13, 19, 25	5
October	15, 16, 22, 23, 29, 30	6	2, 3, 16, 17, 23, 24, 30	7
November	5, 6, 12, 13, 19, 20, 26, 27.	6	Engaged on inspection of the Irish lighthouses, &c. from the 10th to the 28th September 1857.	2
December	4, 11, 24, 31	4	11, 12, 15, 18, 19, 26	6
		72	2, 10, 23, 24	4
				62

HENRY THOMPSON, Esq.,
Merchant; appointed 1856 = 9 years a Member.

—	1857.	Total.	1858.	Total.
January	1, 2, 3, 9, 15, 16, 22, 23, 30	9	1, 14, 15, 21, 28, 29	6
February	6, 13, 20, 26	4	12, 18, 19, 25	4
March	6, 20	2	4, 5, 12, 18, 24, 25	5
April		—	1, 9, 10	3
May		—	10, 20, 28	3
June		—	10, 11, 25	3
July	2, 30, 31	3	1, 22, 29, 30	4
August	6, 20, 21, 27	4	2	1
September	3, 4, 10	3	2, 23, 30	3
October	1, 8, 9, 15, 16, 17, 22, 23, 24, 29, 30.	11	Engaged on inspection of lighthouses, &c. from 10th to 28th September 1857.	3
November	19, 20, 26, 27	4	7, 21, 28	3
December	10	1	4, 5, 11, 15, 19, 26	6
		43	1, 3, 24	2
				42

The Right Honourable the Earl of MEATH,
Colonel of the County of Dublin Militia; appointed 1852 = 7 years a Member.

—	1857.	Total.	1858.	Total.
January		—	7, 14, 21	3
February		—	11, 12, 18, 25, 26	5
March		—	4, 18, 19, 25, 26	5
April		—	1, 8, 15	3
May		—	10th and 20th April 1858 in London waiting on Board of Trade relative to obtaining a steamer for use of Department.	—
June		—	13, 20, 27, 28	4
July		—	Engaged on inspection of the Irish lighthouses, &c. from the 5th to the 20th May 1857, and from the 4th to the 15th May 1858.	—
August		—	3, 10, 11, 25	4
September	6, 13, 14, 20, 28	5	8th, 9th, and 10th of July 1857 waiting on Board of Trade on lighthouse business.	—
October	22, 29	2	2, 9, 16, 23, 24	5
November	5, 19, 26, 27	4	Engaged on inspection of the Irish lights, &c. from the 10th to 28th September 1857.	—
December	3, 17, 24, 31	4	15, 21, 28	3
		17		1
				33

THOMAS BAWLEY, Esq.,
Merchant; appointed 16th January 1857 = 2 years a Member.

—	1857.	Total.	1858.	Total.
January		—	1, 7, 8, 14, 15, 21, 22, 28, 29	9
February	13, 20, 26	3	11, 18, 19, 25	4
March	5, 12, 13, 19, 20, 26, 27	7	4, 5, 12, 18, 19, 24, 25, 26.	8
April	2, 3, 6, 9, 10, 17, 23, 24	8	1, 8, 9, 10, 15, 22, 25	7
May	7, 8, 14, 15, 21, 28, 29	7	6	1
June	4, 5, 11, 12, 18, 19, 25, 26.	8	24, 25	—
July	2, 3, 9, 10, 16, 17, 23, 24	10	1, 2, 8, 9, 15, 16, 22, 23, 29, 30.	8
August	6, 7, 13, 27, 28	5	5, 6, 12, 18, 19, 20, 26, 27.	8
September	3, 4, 11, 24, 25	5	27, 28	—
October	1, 2, 8, 9, 15, 22, 23, 24, 29, 30.	10	2, 3, 9, 10, 16, 17, 23, 24, 30.	9
November	5, 6, 12, 13, 19, 20, 26, 27.	8	4, 5, 11, 12, 15, 19, 25, 26.	8
December	10, 11, 17, 18, 24, 31	6	2, 3, 10, 11, 16, 17, 23, 24, 30.	9
		77		82

FRANCIS CODD, Esq., J.P.,
Member of the Council and Honorary Secretary of Chamber of Commerce, Dublin, Merchant; appointed 1857 = 2 years a Member.

—	1857.	Total.	1858.	Total.
January		—	7, 8, 14, 15, 21, 22, 28, 29.	8
February		—	4, 5, 11, 12, 18, 19, 25, 26.	8
March		—	2, 4, 5, 12, 18, 19, 24, 25, 26.	9
April		—	1, 8, 9, 10, 15, 16, 22, 23, 29, 30.	2
May		—	10th and 20th April 1858 in London waiting on Board of Trade in obtaining a steamer for the Department.	—
June		—	6, 13, 14, 19, 20, 21	6
July		—	3, 4, 11, 18, 25	5
August		—	1, 2, 8, 9, 15, 16, 22, 23, 29, 30.	10
September	20, 21, 27, 28	4	5, 6, 13, 18, 19, 26, 27	7
October	3, 4, 11	3	2, 3, 9, 10, 16, 17, 24, 30	8
November	1, 2, 15, 16, 22, 23, 24, 29, 30.	9	7, 8, 15, 22, 29	6
December	5, 6, 13, 19, 20, 26, 27, 31.	8	7, 11, 12, 15, 18, 25, 26	6
		31	2, 3, 10, 11, 16, 17, 24, 30.	8
				85

JOHN JAMESON ROBERTSON, Esq.,
Director of the City of Dublin Steam Packet Company, Merchant; appointed December 1857 = 14 years a Member.

—	1857.	Total.	1858.	Total.
January		—	21, 28	2
February		—	5, 11, 12, 19, 20	4
March		—	5, 10, 20	3
April		—	9, 22, 23, 30	3
May		—	7, 14, 18, 21, 28	5
June		—	4, 11, 18, 25	4
July		—	27	1
August		—	2, 4	2
September		—	3, 10, 17, 24	4
October		—	1, 8, 22	3
November		—	12, 19, 26	3
December		—	3, 11, 16, 24, 31	4

I. to VIII.

CONSTITUTION OF GENERAL AUTHORITY, &c.

II. to V.

JOHN PETER HARDY, Esq.,

Director of the Bank of Ireland, Merchant and Ship Owner; appointed July 1858 = 1 year a Member.

—	1857.	Total.	1858.	Total.
August - - - - -	-	-	26, 27	2
October - - - - -	-	-	14, 17, 22	3
November - - - - -	-	-	4, 5, 11, 12, 15, 18, 19, 25, 26	9
December - - - - -	-	-	2, 3, 10, 11, 17	5
				19

Right Hon. the Lord Mayor, RICHARD ATKINSON, Esq.,
A Member of the Board during his year of office; appointed 1857.

—	1857.	Total.	1858.	Total.
January - 9 - - - -	1	—	—	—

Right Hon the Lord Mayor, JOHN CAMPBELL, Esq.,
A Member of the Board during year of office; appointed 1858.

—	1857.	Total.	1858.	Total.
January - - - - -	-	-	7, 14, 22	3
February - - - - -	-	-	25	1
April - - - - -	-	-	1	1
July - - - - -	-	-	1, 30	2
August - - - - -	-	-	6	1
October - - - - -	-	-	7	1
November - - - - -	-	-	15, 19	2
				11

The High Sheriff of the City annually appointed an ex-officio Member, Hon. GEORGE HANDCOCK attended on 9th April, 18th September, and 29th October 1857.

SAMUEL LAW, Esq. do. did not attend during his year of office, 1858.

Alderman DENIS MOYLAN, J.P., Distiller,
A Member ex officio, and appointed by the Municipal Corporation annually.

—	1857.	Total.	1858.	Total.
January - 3, 9, 30	3	21	-	1
February - 13	1	18	-	1
March - 19	1	25	-	1
April - 3, 9	2	22	-	1
May - 1	1	19	-	1
July - 24	1	30	-	1
August - 21, 28	2	18	-	1
September - 4, 24	2	7	-	1
October - 29	1	7	-	1
December - -	-	10	-	1
		13		8

Alderman ROBERT H. KINAHAN, J.P.,
A Member ex officio, and appointed by the Municipal Corporation annually.

—	1857.	Total.	1857.	Total.
January - 16	1	14, 21, 22	-	3
February - 5, 6, 12, 18, 23	5	19, 25	-	2
March - 3, 17	2	10, 22, 29, 30	-	4
May - -	-	19	-	1
June - 11, 12, 18, 19, 26	5	25	-	2
July - 30	1	1, 30	-	2
August - 7, 21, 28	3	18, 20	-	2
September - 17, 18	2	9, 10	-	2
October - 24	1	-	-	2
November - 6, 12, 13	3	12, 15	-	2
December - 11	1	-	-	2
		25		19

Alderman JOHN REYNOLDS, J.P.,
A Member ex officio, and appointed by the Municipal Corporation annually.

—	1857.	Total.	1858.	Total.
January - 9	1	15	-	1
February - -	-	5	-	1
April - 5	1	5	-	1
July - 24	1	30	-	1
December - -	-	2, 30	-	2
		3		5

Upon the decease or resignation of a member, notice is published in the Gazette and other newspapers, that, upon a certain day therein named, the Board will proceed to elect a "fit and able person" to fill the vacancy. The Corporation is then specially summoned, and at their meeting the party is balloted for, and a return, under the corporate seal, of his election, forwarded to the Lord Lieutenant and Privy Council; and should no disapproval be given within 21 days after the return has been left at the Privy Council office, he then becomes a member of the Corporation, and is sworn in at the first meeting he attends.

See 2d Geo. 3. c. 19. s. 11. (Answer VI.)

The members' services are gratuitous.

Answer to Query No. II.

Duties of the Corporation, Committees, &c. &c.

The general supervision of the lights, buoys, and beacons on the Irish coast, the receipt and disbursement of all monies paid in respect thereof, and the direction and control of all persons engaged in their management.

The committees are appointed by selection from the members of the corporation. They are as follows:—

LIST OF COMMITTEES.

Library.	Lightship.	Inspecting.	Accounts.
Chas. Halliday. Robert Callwell. Geo. Roe. M. Stanton. The Earl of Meath. Sir J. Donbrain.	Sir J. Donbrain. The Earl of Meath. Col. La Touche. Chas. Halliday. Robert Callwell.	Sir J. Donbrain. Meath. Geo. Roe. Henry Thompson. Robert Callwell. Col. La Touche.	Thos. Cross-thwait. Mich. Stanton. Sir J. Donbrain. H. Thompson. J. P. Hardy. Thos. Bewley.

Life Boat Committee.	Harbour Byelaws Committee.	Graving Dock Committee.
Sir James Donbrain. Charles Halliday, Esq. Francis Codd, Esq. Colonel La Touche. Thos. Cross-thwait, Esq. Robert Callwell, Esq.	Charles Halliday, Esq. Francis Codd, Esq. Thomas Bewley, Esq. Sir James Donbrain.	Sir James Donbrain. Charles Halliday, Esq. Thomas Bewley, Esq. Jno. J. Robertson, Esq. Francis Codd, Esq. J. P. Hardy, Esq.

East Quay Wall Tax Committee.	Pilotage Committee.
Charles Halliday, Esq. The Lord Mayor. Thomas Cross-thwait, Esq. Alderman Kinahan. Alderman Moylan. Sir James Donbrain. George Roe, Esq.	Sir John K. James, Bart. Thomas Cross-thwait, Esq. Charles Halliday, Esq. Robert Callwell, Esq. Michael Stanton, Esq. Sir James Donbrain. Colonel La Touche. J. P. Hardy, Esq. Francis Codd, Esq. Thomas Bewley, Esq. The Earl of Meath.

The above are the Standing Committees of the Board, but others are appointed from time to time as special business may require; they are summoned whenever any important matters are referred to them; no record is, however, kept of their meetings.

Answer to Query No. III.

Days of Meeting, &c.

Ordinary days of meeting are Thursdays and Fridays in each week, but special meetings are summoned when any particular business requires to be transacted, and the offices are visited by one or more members of the Corporation nearly every day.

Answer to Query No. IV.

Names of members who attended each meeting in 1857 and 1858, with the dates of each attendance.

See reply to Query No. I, first part.

Answer to Query No. V.

Names of Members who have been employed on Special Services or Inspections, in 1857 and 1858, with a Statement showing the Nature of the Services on which they were employed, and the Time occupied:—

Name.	Nature of Service.	Time occupied.	1857.	1858.
The Earl of Meath, Sir Jas. Donbrain, Geo. Roe, Esq., Robt. Callwell, Esq., Colonel La Touche.	Inspecting light-houses, buoys, and beacons round the Irish coast.	16 days.	From 5th to 20th May inclusive.	
Sir Jas. Donbrain, The Earl of Meath, H. Thompson, Esq., Robt. Callwell, Esq.	Do.	19 days.	From 10th to 28th of September inclusive.	
Robt. Callwell, Esq., The Earl of Meath, Sir Jas. Donbrain.	Do.	12 days.		From 4th to 15th of May inclusive.
Sir Jas. Donbrain, G.A. Hamilton, Esq., The Earl of Meath, Geo. Roe, Esq., Chas. Halliday, Esq.	Waiting on President of Board of Trade as to procuring a steamer for permanent service of the Corporation.	3 days.	From 8th to 10th July.	
The Earl of Meath, Sir Jas. Donbrain, Thos. Cross-thwait, Francis Codd, Chas. Halliday, Esq.	Waiting on President of Board of Trade as to procuring a steamer for the permanent service of the Corporation.			19th and 20th April.

IRELAND.

I. to IX.

CONSTITUTION OF GENERAL AUTHORITY, &c.

I. to IX.

Circular 1.
Questions
1. to IX.

The meetings of the Corporation are regulated by the Act, copy of which is herewith sent.

26 Geo. 3. c. 19.

First meeting to be on or before first May next.—A Ballast-office to be appointed.—Each member to take the oath herein.

5. And be it enacted by the authority aforesaid, that the members of the said Corporation hereby appointed, or some three of them, do and shall meet and assemble themselves at the Royal Exchange in Dublin, on or before the first day of May next, and do and shall at such meeting appoint and constitute one office in some proper and convenient place in the said city, which from thenceforth shall be called and known by the name of "The Ballast Office of the Port of Dublin;" and that each and every of the members of the said Corporation shall, before they or any of them proceed to execute the purposes of this Act, take and subscribe the following oath or affirmation:—

"I, B. do solemnly promise and swear, that I will faithfully and impartially, according to the best of my skill and knowledge, execute the several powers and trusts committed to me in and by an Act of Parliament now in force in this Kingdom, entitled 'An Act for promoting the Trade of Dublin, by rendering its Port and Harbour more commodious,' without favour or affection, prejudice or malice; and I do also solemnly swear, that I have not entered, and that during my being a member of the Corporation appointed by the said Act will not enter, into any contract, directly or indirectly, for executing the purposes of the said Act or any of them, or for supplying any materials for carrying on or executing the same, nor will I be engaged in any security for any person or persons holding or who shall hold any office by virtue of the said Act, or for any person or persons entering into or who shall enter into any contract relating to the execution of any part of the said Act.

"So help me God."

Which oath or affirmation any three or more of the said members are hereby empowered to administer to each other, and the same is to be entered in a book to be kept particularly for that purpose.

No Act deemed an Act of the Corporation if three members be not present.

6. And be it further enacted, that no act of the members of the said Corporation shall be deemed an act of the said Corporation unless there shall be at the least three members of the said Corporation duly assembled, present at such act, and that the act of the majority of the members present, not being fewer than three, at every meeting duly assembled, shall be and be considered as the act of the said Corporation.

May meet when they think proper.

7. And be it further enacted by the authority aforesaid, that from and after such time as such office shall be so appointed as aforesaid the said Corporation shall and may, at such times and as often as they shall think fit, meet and assemble themselves at the place so to be appointed, or at such other place as shall or may from time to time be appointed by them for such office, and shall and may at such meetings give and sign orders for the necessary, current, and usual expenditures for the carrying on the general and usual business of the said Corporation.

May summon a meeting when deemed necessary.—sign orders, —appoint officers.—establish salaries.—renew officers, —make rules, &c.—Such rules, &c. not to be contrary to law.

8. And be it further enacted by the authority aforesaid, that it shall and may be lawful to and for the said Corporation from time to time, when and as often as they shall think necessary or find it expedient, by summons to be left at the usual place of abode of each and every of the members of the said Corporation, to convene a meeting or meetings of the said Corporation to be held at the said office, which summons shall express the purpose for which such meeting shall be intended, and that it shall and may be lawful to and for the said Corporation, at such respective meeting or meetings so to be convened as aforesaid, to give and sign orders for the payment of all extraordinary or unusual expenditures which they shall find and judge necessary for carrying into execution the purposes of this Act, and to elect and appoint such officers as they shall think fit and proper for the execution of the several matters comprised in this Act, and to establish such salaries and allowances to be paid to such officer and officers, and every of them respectively, out of the produce of the payments and duties herein-after directed to be paid, as to the said Cor-

poration shall seem fit and reasonable, and the same to increase or diminish from time to time as to them shall seem reasonable, and also from time to time, when it shall appear to the said Corporation that such officers, or any of them, shall have been guilty of any neglect or improper conduct, to remove such officers or any of them, and to elect such others in their stead, as they shall think fit, and also from time to time to make and ordain such rules, orders, byelaws, and regulations for cleansing and improving the said port, harbour, and river of Dublin, and for regulating the conduct of the masters and owners of shipping resorting to the said port and harbour, in the throwing out and taking in their ballast, and in stationing and mooring their ships and vessels, and for regulating the conduct of the owners and managers of lighters, gabbards, and other vessels to be employed in furnishing ballast to and taking ballast from such shipping, and for securing of ships and vessels trading to the said port and harbour, and for regulating and conducting the business of the aforesaid office, and for the well governing of the said office, and the several officers and clerks to be employed therein, and in and about the business thereof, and for regulating the conduct of and well governing the several pilots, pilot-masters, and haven-masters to be appointed as herein-after mentioned, and for appointing the place in which such office as aforesaid shall be from time to time held, as the said Corporation shall judge necessary or expedient; all which rules, orders, byelaws, and regulations shall be as binding and conclusive, to all intents and purposes, as if the same were enacted by this Act: Provided such rules, orders, byelaws, and regulations, or any of them, or any matter therein to be contained, shall not be contrary to any of the laws or statutes of this realm, or to this Act, or any of the clauses herein contained.

Returns in writing to be made of all such proceedings, and laid before the Chief Governor and Council;—if disapproved of by them, void.

9. And provided also, that no such appointment or appointments as aforesaid, of any such officer or officers as aforesaid, or of the salary or salaries, allowance or allowances, to be paid to them or any of them, shall be valid, nor shall any rule, order, byelaw, or regulation to be made by the said Corporation be of any force or effect, unless a return in writing of such appointment or appointments, salary or salaries, allowance or allowances, as aforesaid, and a true copy of such rule, order, byelaw, or regulation as aforesaid, as the case shall happen to be, (which return or copy shall be under the seal of the said Corporation,) shall be laid before the Lord Lieutenant or other chief governor or governors and the Privy Council of this kingdom for the time being, by delivering the same at the office of the clerk of the Privy Council twenty-one days at least before such appointment or appointments, rule, order, byelaw, or regulation shall be intended to take effect; and if the said Lord Lieutenant or chief governor or governors and Privy Council shall, within the said twenty-one days, signify to the said Corporation at their said office their disapprobation of such appointment or appointments, rule, order, byelaw, or regulation respectively, the same shall be of no force or effect.

If their disapprobation be not signified within twenty-one days, such proceedings deemed valid.

10. Provided always, that if the said Lord Lieutenant or other chief governor or governors and Privy Council for the time being shall not within the said twenty-one days, to be computed from the day of delivering at the office of the clerk of the Council in manner aforesaid such return or copy as aforesaid, signify to the said Corporation at their said office their disapprobation of such appointment or appointments, rule, order, byelaw, or regulation respectively, the same shall from the time of the expiration of the said twenty-one days stand in full force and effect, notwithstanding that such Lord Lieutenant or chief governor or governors and Privy Council shall not have signified any express approbation thereof.

May elect members when vacancies happen.—The Lord Mayor, &c. to elect an alderman to be a member of said Corporation, when any of those hereby appointed shall die, &c.—Three aldermen to be always in the Corporation.

11. And be it further enacted by the authority aforesaid, that for continuing the succession of the said Corporation from time to time, when and as often as any of the said persons hereby named, or hereafter to be elected members of the said Corporation, shall happen to die, or resign, or refuse or decline to act, the remaining members of the said Corporation, at a meeting to be convened by public advertisement in the Dublin Gazette, and in such other public

I. to IX.

CONSTITUTION OF GENERAL AUTHORITY, &c.

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IRELAND.
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newspaper in the city of Dublin as three or more of the said members shall appoint, and also by summons as aforesaid, shall from time to time elect, nominate, and appoint a fit and able person, or fit and able persons, to be member or members of the said Corporation, in the room and stead of such person or persons as shall so happen to die or resign, or refuse or decline to act, save only that in case such vacancy shall happen either by the death or resignation or by the refusing or declining to act of the said Alderman James Hamilton, Alderman William Alexander, or Alderman Henry Howison, then and in such case the Lord Mayor and Board of Aldermen of the said city shall, within twenty-one days from the time such vacancy shall happen, elect, nominate, and appoint one or more alderman or aldermen to be a member or members of the said Corporation, in the room of such of the said aldermen who shall so happen to die or resign, or refuse or decline to act, and shall continue so to do when any of the said aldermen shall die, resign, refuse or decline to act, so as that at all times hereafter there may be three aldermen of the said city in the said Corporation.

Upon neglect of Lord Mayor and Board of Aldermen for twenty-one days, it shall not afterwards be in their power.

12. Provided, that in case the said Lord Mayor and Board of Aldermen shall omit or neglect to make such election, nomination, or appointment as aforesaid within the said twenty-one days from the time such vacancy shall happen, the said Lord Mayor and Board of Aldermen shall not afterwards have any right or power of electing any alderman or aldermen or other person or persons in the room of such of the aforesaid aldermen as shall so happen to die, resign, or refuse to decline or act.

Such person to be approved of by the chief governor and Council.

13. Provided always, that no person so to be elected shall have power to act as a member of the said Corporation unless a return in writing, containing the name and addition of the person who shall be so elected, shall be laid before the Lord Lieutenant or chief governor or governors and Privy Council of this kingdom for the time being, by leaving the same at the office of the clerk of the Privy Council twenty-one days at least before such person shall in any manner act as a member of the said Corporation; and that if the said Lord Lieutenant, or chief governor or governors, and Privy Council, shall, within the said twenty-one days, signify to the said

Corporation at their said office their disapprobation of such election, and direct a new one to be made, then such election shall be void, and the said Corporation shall go to and hold in like manner a new election for the filling up such vacancy or vacancies, and so from time to time until such person shall be so elected as shall not be disapproved of by the Lord Lieutenant, or chief governor or governors, and Privy Council, as aforesaid.

If disapprobation be not signified within twenty-one days, the election valid.

14. Provided always, that if the said Lord Lieutenant or chief governor or governors and Privy Council for the time being, shall not within the said twenty-one days, to be computed from the day of delivering in manner aforesaid such return as aforesaid, signify to the said Corporation at their said office a disapprobation of such election as aforesaid, the same shall, from the time of the expiration of the said twenty-one days, be valid and effectual to all intents and purposes, notwithstanding that such Lord Lieutenant or chief governor or governors and Privy Council shall not have signified any express approbation thereof, and then and from thenceforth every person so to be elected shall have full power and authority to act and do in all things comprised in this Act, in as full, large and ample manner, to all intents and purposes, as any of the members hereby nominated and appointed.

Any member absent for three months without licence shall cease to be a member, unless prevented by sickness.

15. And be it enacted by the authority aforesaid, that if any of the persons now nominated or who shall hereafter be elected a member of the said Corporation, pursuant to the powers of this Act, shall continue to absent himself from the meetings of the said Corporation for the space of three calendar months, without licence from the said Corporation previously given and entered in the minutes of the said Corporation, such person shall, from and after the expiration of the said three months, be deemed and considered as having declined to act, and shall to all intents and purposes cease to be a member of the said Corporation, and the said Corporation shall proceed in manner herein-before directed to the election of and shall elect a person in the room of the person so absenting himself, unless it shall fully appear to the said Corporation that such person was prevented from attending the meetings of the said Corporation by sickness.

X.

GROSS INCOME AND EXPENDITURE FOR 1857 AND 1858.

X.

	Income.	From Light Duties.	From casual receipts	Total.
		£ s. d.	£ s. d.	£ s. d.
1857 - -	13,288 11 7	18 8 2	13,306 19 9	
1858 - -	15,526 3 8	183 17 9	15,710 1 5	
				£ s. d.
Gross expenditure for 1857 - -	- -	- -	58,768 6 1	
Ditto 1858 - -	- -	- -	46,658 2 3	

XI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XI.

IRELAND.

MAINTENANCE OF LIGHTHOUSES—Abstract A.—continued.

Circular I.
Question XI.

Amount of disbursements as shown in the above table, £ s. d.

Accounts paid for stores, supplies, &c., viz.:	£	s.	d.	21,425	2	4
Lampfitter	17	11	0			
"	13	19	0			
"	22	4	0			
"	1	4	0			
Oil				54	18	0
Carriage of stores				5	1	5
Freights and insurances	2	17	6			
"	30	14	6			
"	82	14	1			
Materials	24	9	5			
"	245	1	0			
"	267	5	0			
"	18	8	9			
Carried forward				555	4	2
				742	4	9

Brought forward	£	s.	d.	742	4	9	21,425	2	4
Advertising				24	6	6			
"				20	5	6			
"				27	7	6			
Incidents				6	7	8	71	19	6
"				31	10	0			
"				64	6	7			
							102	4	3
							916	8	6
							22,341	10	10

Office, Port of Dublin Corporation,
20th January 1860.

J. HANKS,
Accountant.

MAINTENANCE OF FLOATING LIGHTS.—Disbursement Account for the Year ending 31st December 1857.

Abstract B.

STATION.	Wages and Allowances.	Coals and Fuel.	Carriage of Oil and Stores.	Repairs.	Incidentals.	Total Amount.
1. Kish Bank	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
	190 8 0	3 3 0	22 10 0	34 4 11	-	224 2 2
	63 16 3					
	102 4 8	3 3 0	22 10 0	9 18 2	-	202 4 7
	64 8 9					
	103 1 2	2 2 0	15 0 0	6 12 1	-	193 5 3
Total	671 0 4	11 11 0	82 10 0	74 10 6	0 19 6	840 11 4
	99 13 0	2 0 0	21 12 0	34 5 5	1 15 0	221 2 11
	61 17 6					
	103 13 0	4 0 0	43 4 0	7 9 7	-	222 15 4
	64 8 9					
	103 13 0	2 0 0	21 12 0	8 9 1	-	198 19 1
Total	661 3 3	11 0 0	121 16 0	51 18 10	2 4 5	848 2 6
	160 18 0	-	29 5 0	42 14 10	-	240 7 10
	67 10 0					
	105 3 0	-	29 5 0	20 8 1	-	225 17 4
	72 1 3					
	108 3 0	-	29 5 0	14 5 1	-	220 13 1
Total	694 18 3	17 10 0	117 0 0	81 11 6	0 5 1	911 4 10
	12 3 9	-	-	-	-	12 3 9
	25 19 3	-	3 10 0	100 2 3	39 15 11	241 12 5
	63 5 0					
Total	101 8 0	-	3 10 0	100 2 3	39 15 11	253 16 2

Amount of Disbursements, as shown above, brought forward £ s. d. 2,833 14 10

Accounts paid for stores, supplies, &c., viz.:

Wages	£	s.	d.	118	10	4
"	37	0	4			
"	30	10	0			
"	38	10	0			
"	42	10	0			
Allowances	20	11	3			
"	17	1	3			
"	21	2	6			
"	23	0	0			
Coals				81	15	0
Carriage of stores				2	4	9
Repairs	17	16	11			
"	2	9	9			
"	38	14	3			
"	3	2	5			
	41	3	4			
Carried forward				295	13	5

Brought forward	£	s.	d.	293	13	5	2,833	14	10
Incidents				13	6	1			
"				1	17	6			
Materials, glasses				36	0	0			
" wicks				12	15	0			
" oil				472	1	7	520	16	7
General				2	2	6			
"				1	11	11			
							3	14	5
							833	8	0
Total							£,3687	2	10

Port of Dublin,
20th January 1860.

J. HANKS,
Accountant.

XI. CONSTITUTION OF GENERAL AUTHORITY, &c.
OFFICE AND HOUSE EXPENSES in the Year ending 31st December 1857.

Abstract E.		£ s. d.	£ s. d.
Half the expenditure for the year 1856, chargeable to the Mercantile Marine Fund			265 4 11
Car-hire and carriage of parcels		0 19 6	
" " "		8 11 0	
" " "		8 19 1	
" " "		4 6 1	
Petty expenses		3 4 9	22 15 8
" " "		5 13 8	
" " "		2 10 4	
" " "		6 4 11	17 13 8
Postages		16 9 8	
" " "		1 12 11	
" " "		33 17 8	
" " "		9 6 3	
Stationery, per Her Majesty's Stationery Office			61 6 6
Furnishings		4 0 6	50 15 1
" " "		1 2 8	
" " "		2 12 0	
			7 15 2
			£466 11 0

ACCOUNT OF DISBURSEMENTS FOR SALARIES of the Establishment in DUBLIN in the Year ended 31st December 1857.

Abstract F.		£ s. d.	£ s. d.
W. J. Fennell, temporary extra clerk		1 11 1	
" " "		2 6 8	
" " "		1 3 4	
" " "		4 10 0	9 11 1
George Halpin, Superintendent		505 11 1	
Wm. Lees, Secretary		190 0 0	
J. M. O'Reilly, Assistant Secretary		115 0 9	
H. Verker, Chief Clerk		500 0 0	
John Hanks, Accountant		273 0 0	
Jno. Cossart, Examiner Lt. Duties		210 0 0	
R. Croke, Assistant ditto		180 0 0	
Wm. Hanks, ditto, ditto		180 0 0	
E. F. Roberts, Marine Inspector		300 0 0	
Thos. Brownrigg, General Clerk		30 0 0	
		2,385 11 10	
		£2,395 2 11	

ACCOUNT OF MISCELLANEOUS DISBURSEMENTS for the Year ending 31st December 1857.

Abstract G.		£ s. d.	£ s. d.
Paid to the Paymaster of Civil Service, the 10th and 11th instalments of 4,000 <i>l.</i> , late Irish currency, each being in repayment of a sum of 60,000 <i>l.</i> , late Irish currency, advanced by the Irish Exchequer to the Commissioners, for building Dunlany or Kinsdown Harbour, and the repayment made chargeable upon the surplus Lighthouse Duties by the Act 1 Geo. 4. cap. 32.			7,384 12 4
Expenditure on Inspections:—			
Travelling expenses		117 16 7	
Travelling expenses to London, &c., on service of the Corporation		51 0 10	
Provisions, &c., during inspection round the coast of Ireland		268 18 3	
		437 15 8	
Total		£7,822 8 0	

Dublin Light Office, 1860. J. HANKS, Accountant.

EXPENSES OF COLLECTION.—Disbursement Account in the Year ending 31st December 1857.

Abstract H.		£ s. d.
Drogheda	March quarter	32 12 0
Galway	June quarter	41 6 11
Newry	September quarter	47 17 6
Sligo	December quarter	40 1 3
Total		161 17 8

Port of Dublin Corporation, 1860. J. HANKS, Accountant.

SUPERANNUATION ALLOWANCES.—Disbursement Account in the Year ending 31st December 1857.

Abstract I.		£ s. d.	£ s. d.
Weekly	March quarter	19 10 0	
	June quarter	19 10 0	
	September quarter	21 1 1	
	December quarter	21 2 6	81 3 7
Lightkeepers	March quarter	57 7 2	
	June quarter	47 2 1	
	September quarter	41 14 5	
	December quarter	41 14 5	187 18 1
Adults and children	March quarter	35 6 10	
	June quarter	33 11 10	
	September quarter	34 3 6	
	December quarter	33 14 4	136 16 6
E. A. Gibbon, Pay Clerk	March quarter	2 1 8	
	June quarter	2 1 8	
	September quarter	2 1 8	
Lightship service	March quarter	45 2 3	6 5 0
	June quarter	45 2 3	
	September quarter	45 2 3	
	December quarter	45 2 3	135 6 9
Total			547 9 11

Port of Dublin Corporation, 1860. J. HANKS, Accountant.

ACCOUNT OF DISBURSEMENTS FOR NEW WORKS in the Year ended 31st December 1857.

Abstract L.		Payment.		Total.
Works at		Workmen.	Materials.	£ s. d.
		£ s. d.	£ s. d.	
Arran Island, North		219 6 7	60 15 9	
" " "		262 9 9	2,740 9 6	
" " "		415 12 9	182 18 2	
" " "		468 17 1	230 0 4	
		1,366 6 2	3,214 3 9	4,580 9 11
Arran Island, South		274 5 2	53 16 8	
" " "		445 5 2	2,635 0 11	
" " "		476 18 10	186 13 0	
" " "		416 17 0	185 6 7	
		1,613 6 2	3,421 17 2	4,035 3 4
Ballycotton		3 10 0	9 11 0	
" " "			197 16 9	
" " "			34 3 0	
		3 10 0	241 10 9	245 0 9
Broadhaven				2 12 6
Black Rock, Black Sod Bay.		16 2 0	30 2 1	46 4 1
Beeves				2 5 0
Bearhaven				1 10 0
Clif Rock				8 7 0
Dundalk				3 0 0
Dungarvan		59 2 7	17 8 9	
" " "		28 16 0	2 11 1	
" " "		24 14 9	1 7 6	
" " "		40 16 0	5 14 7	
		153 9 4	27 1 11	180 11 3
Fastnet		17 10 0	138 13 8	
" " "		138 15 3	15 14 6	
" " "		271 3 7	81 0 3	
" " "		243 15 3	45 17 11	
		671 4 1	281 6 4	952 10 5
Foze Rock				68 7 2
Kinsale				1 9 0
Loophoad				2 15 6
Newcastle				7 19 3
Rathlin O'Beirne				12 12 0
Rathlin Island				379 8 3
Rock a Bell				806 8 11
Samphire				2 15 6
Light Ships:—				
"New Brilliant," being built at Cork		836 13 3		
"New Star," being built at Cork		5,233 19 6		6,070 12 9
Beacons, Buoys, and Perches: Mar. qr.		48 11 3		
" June qr.		53 13 1		
" Sept. qr.		4 11 0		
" Dec. qr.		112 8 5		219 3 9
Total				£ 17,629 6 4

Port of Dublin Corporation, January 1860. J. HANKS, Accountant.

IRELAND. Circular 1. Question XI.

XI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XI.

DISBURSEMENT ACCOUNT, under the Act 16 & 17 Vict. cap. 131., paid in the Four Quarters ending 31st December 1858.

Table with 3 columns: Description of expenses (e.g., For maintenance of Lighthouses, For Floating Lightvessels), Amount (£ s. d.), and Reference (e.g., as per Abstract A).

£49,473 11 2

Port of Dublin Corporation, 31st December 1858.

J. HANKS, Accountant.

MAINTENANCE OF LIGHTHOUSES.—Disbursement Account for the Four Quarters ending 31st December 1858.

Abstract A.

Large table with multiple columns: No. of Galls., Oil Amount (£ s. d.), Station, Wages and Allowances (£ s. d.), Rent (£ s. d.), Coals or Fuel (£ s. d.), Carriage of Oil and Stores (£ s. d.), Boat Hire and Assistance (£ s. d.), Repairs (£ s. d.), Incidentals (£ s. d.), and TOTAL AMOUNT (£ s. d.).

Amount of disbursements, as shown in the above table, brought forward £ 222,653 6 9

Brought forward Materials £ 25 9 9

Accounts paid for stores, supplies, &c., viz.:-

Summary table for accounts paid for stores, supplies, &c., with columns for description (Lampfitter, Carried forward) and amounts (£ s. d.).

Office, Port of Dublin Corporation, 1860.

J. HANKS, Accountant

* Thus marked are double lights.

† Thus marked are three houses.

XI. CONSTITUTION OF GENERAL AUTHORITY, &c. XI. IRELAND.
 MAINTENANCE OF FLOATING LIGHTS.—Disbursement Account for the Four Quarters ending 31st December 1858.

Circular I.
 Question XI.

Abstract B.

STATION.	Wages and Allowances.	Coals and Fuel.	Carriage of Oil and Stores.	Repairs.	Incidentals.	Total Amount.
1. Kish Bank, "Seagull" - - -	£ s. d. 774 11 3	£ s. d. 15 0 0	£ s. d. 97 10 0	£ s. d. 118 11 3	£ s. d. 6 3 1	£ s. d. 1,013 10 7
2. Arklow Bank, "Relief" - - -	777 2 2	12 0 0	134 4 0	84 15 7	0 9 0	1,068 10 9
3. Coumshingaugh, "Petrel" - - -	806 16 8	17 0 0	132 15 0	100 7 9	6 17 3	1,064 6 9
4. Blackwater, "Brilliant" - - -	796 0 10	12 0 0	105 0 0	115 1 3	80 13 7	1,108 15 8
Total - - - - -	3,154 10 11	57 5 0	469 9 0	418 15 10	94 3 0	4,194 3 9

Amount of Disbursements, as shown in the above table, brought forward £ s. d. 4,194 3 9
 Accounts paid for stores, supplies, &c., viz.:—
 Seamen, &c., Wages and Allowances - - - - - £ s. d. 270 5 1
 Sundry Persons, Repairs - - - - - 591 4 11
 " Incidentals - - - - - 9 14 4

871 4 4
 5,065 8 1

Port of Dublin, 1860.

J. HANKS, Accountant.

MAINTENANCE OF BUOYS AND BEACONS.—Disbursement Account in the Year ending 31st December 1858.

Abstract C.

STATIONS.	March quarter.	June quarter.	September quarter.	December quarter.	Total Amount, 1858.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Angus Rock - - - - -	- - - -	1 18 8	- - - -	- - - -	1 18 8
Arklow Bank - - - - -	- - - -	18 0 0	1 5 0	- - - -	19 5 0
Black Rock - - - - -	- - - -	9 19 0	7 8 0	- - - -	17 7 0
Batter Pladdy - - - - -	23 4 1	43 14 6	73 10 2	- - - -	142 8 9
Brizes - - - - -	4 0 0	13 0 0	- - - -	- - - -	17 0 0
Bullockmore - - - - -	- - - -	3 0 0	14 8 9	- - - -	17 8 9
Burrin - - - - -	- - - -	- - - -	4 5 6	- - - -	4 5 6
Blackwater - - - - -	26 15 0	39 5 0	- - - -	- - - -	65 0 0
Bearhaven Island - - - - -	4 12 0	4 15 0	4 16 0	4 17 0	19 0 0
Burford Bank - - - - -	4 0 0	6 0 0	13 17 6	- - - -	23 17 6
Brough Rock - - - - -	- - - -	7 6 0	1 14 11	- - - -	3 0 11
Baltimore - - - - -	- - - -	6 0 0	- - - -	0 6 0	6 6 0
Bullman Rock - - - - -	10 5 0	6 0 0	5 0 0	0 10 6	21 15 6
Clough Corneac - - - - -	16 0 0	- - - -	- - - -	- - - -	16 0 0
Codlign - - - - -	- - - -	52 4 0	46 1 6	- - - -	98 5 6
Carrick a Nogue - - - - -	- - - -	6 0 0	- - - -	- - - -	6 0 0
Carzee - - - - -	- - - -	4 0 0	- - - -	- - - -	4 0 0
Cannon Rock - - - - -	- - - -	- - - -	- - - -	25 12 6	25 12 6
Castletown - - - - -	- - - -	- - - -	- - - -	2 15 4	2 15 4
Danger Rock - - - - -	- - - -	- - - -	5 0 0	2 10 0	7 10 0
Deputy Rock - - - - -	- - - -	4 0 0	- - - -	- - - -	4 0 0
Donaghadee - - - - -	5 6 11	8 14 6	4 16 9	3 17 3	21 15 4
Dog Rock - - - - -	- - - -	0 15 6	1 8 0	3 14 2	5 18 8
Dant Rock - - - - -	- - - -	52 18 6	162 4 2	0 19 4	216 2 0
Dunnanny - - - - -	- - - -	- - - -	11 0 0	1 0 0	12 0 0
Fionis - - - - -	0 4 6	1 3 0	5 19 10	- - - -	7 7 4
Foynes - - - - -	- - - -	- - - -	- - - -	15 2 0	15 2 0
Forcland - - - - -	- - - -	- - - -	1 11 11	- - - -	1 11 11
Glandase - - - - -	- - - -	1 0 0	8 0 0	2 10 0	11 10 0
Glassgorman - - - - -	1 5 0	1 5 0	9 0 0	- - - -	11 10 0
Governor - - - - -	- - - -	4 0 0	- - - -	- - - -	4 0 0
Holdens - - - - -	12 10 0	- - - -	12 10 0	- - - -	25 0 0
Hellyhunter - - - - -	1 5 0	- - - -	12 0 0	- - - -	13 5 0
Hornet - - - - -	- - - -	7 12 0	- - - -	- - - -	7 12 0
Horse Rock - - - - -	- - - -	11 14 7	- - - -	- - - -	11 14 7
Hunter's Rock - - - - -	12 15 6	- - - -	- - - -	5 15 6	18 11 0
India Bank - - - - -	- - - -	8 0 0	1 5 0	- - - -	9 5 0
Imogene - - - - -	- - - -	13 0 0	1 5 0	- - - -	14 5 0
Kish Bank - - - - -	4 0 0	4 0 0	5 5 0	- - - -	13 5 0
Kay Rock - - - - -	- - - -	- - - -	5 0 0	1 0 0	6 0 0
Long Bay - - - - -	3 0 0	12 10 0	14 5 0	- - - -	29 15 0
Larne Lough - - - - -	- - - -	0 9 8	- - - -	- - - -	0 9 8
Poolbeg - - - - -	4 18 2	20 5 0	21 11 3	55 7 5	102 1 10
Pladdens - - - - -	- - - -	4 0 0	- - - -	- - - -	4 0 0
Rusk - - - - -	100 1 0	8 6 6	25 5 0	- - - -	133 12 6
Ridge - - - - -	18 0 0	- - - -	- - - -	- - - -	18 0 0
Sculmartin - - - - -	- - - -	- - - -	1 11 11	- - - -	1 11 11
Smith's Rock - - - - -	- - - -	22 0 0	2 11 6	- - - -	24 11 6
Splough - - - - -	13 0 0	- - - -	13 0 0	- - - -	26 0 0
Santa Margareta - - - - -	- - - -	6 6 3	- - - -	6 4 0	12 10 3
St. Patrick - - - - -	- - - -	2 14 4	- - - -	- - - -	2 14 4
Swilly - - - - -	- - - -	7 6 9	0 5 0	- - - -	7 11 9
Taylor's - - - - -	- - - -	- - - -	4 5 6	- - - -	4 5 6
Valentia - Wrecks on and off - - - - -	39 10 0	- - - -	4 0 0	9 0 0	52 10 0
White Strand - - - - -	- - - -	15 0 0	- - - -	- - - -	15 0 0
Wheaten Rock - - - - -	- - - -	1 0 0	- - - -	- - - -	1 0 0
General Service - - - - -	314 12 2	376 19 9	555 0 11	140 0 11	1,386 13 9
	453 7 3	203 3 10	920 18 6	192 7 10	1,769 17 5
					3,156 11 2

IRELAND

XI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XI.

STEAM AND SAILING VESSELS.—Disbursement Account in the Four Quarters ending 31st December 1858,

Abstract D.

Circular 1.
Question XI.

Name of Vessel.	No. of Voucher.	Wages and Allowances.	Coals.	Pilotage and Boat Hire.	Repairs.	Insurance.	Incidentals, Medicine, & Postages.	Total Amount.
Vestal, on inspection	June	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
" " "	September	6 14 6	251 5 6	7 9 0	- - -	- - -	2 0 0	283 5 6
The Midge	September	24 7 6	- - -	- - -	52 5 3	- - -	- - -	207 9 0
" " "	December	244 0 0	32 0 0	2 2 6	102 13 6	- - -	- - -	- - -
		268 7 6	32 0 0	2 2 6	154 18 9	- - -	- - -	457 8 9
Establishment at North Wall	March	75 12 4	1 8 0	- - -	5 15 2	- - -	0 6 6	75 17 9
" " "	June	87 18 2	2 2 0	- - -	- - -	- - -	0 10 6	- - -
" " "	September	83 0 0	0 14 0	- - -	11 10 4	10 17 0	0 17 6	- - -
" " "	December	83 15 2	2 11 3	- - -	0 12 0	- - -	- - -	- - -
		330 5 8	6 15 3	- - -	17 17 6	10 17 0	1 14 6	- - -
								367 9 11
								1,122 7 8

OFFICE AND HOUSE EXPENSES in Four Quarters ending 31st December 1858.

Abstract E.

	£ s. d.	£ s. d.
Postages	- - -	50 14 8
Parcels	- - -	19 4 6
Petty expenses	- - -	15 14 0
Repairs	- - -	93 14 4
Stationery	- - -	122 6 3
Wm. Lees, Secretary, 6 months allowance in lieu of residence	75 0 0	376 13 9
Mercantile Marine Fund, charged with moiety of the General Ballast Office House expenditure, for moiety of year 1857	331 10 4	
Car-hire of Pay Clerk	3 18 0	
		333 8 4
		712 2 1

ACCOUNT OF DISBURSEMENTS for SALARIES of the Establishment in DUBLIN in the Four Quarters ending 31st December 1858.

Abstract F.

	£ s. d.
George Halpin, Superintendent	522 4 8
Wm. Lees, Secretary	200 0 0
J. M. O'Reilly, Assistant ditto	121 14 1
Henry Vereker, Chief Clerk	425 0 0
Jerb. Hanks, Accountant	253 6 8
John Cossart, Examiner of Light Dues	210 0 0
Richard Crooke, Assistant ditto	180 0 0
Wm. Hanks, Assistant ditto	180 0 0
E. F. Roberts, Marine Inspector	300 0 0
Thomas Browning, General Clerk	30 0 0
	2,452 5 2

Dublin Light Office, 1860.

J. HANKS, Accountant.

ACCOUNT of MISCELLANEOUS DISBURSEMENTS for the Four Quarters ending 31st December 1858.

Abstract G.

	£ s. d.	£ s. d.
On inspection :		
Workmen	- - -	3 5 10
Provisions	- - -	44 13 11
Materials	- - -	5 4 0
Provisions, Wine, &c.	- - -	49 17 6
Travelling expenses	- - -	30 10 10
		133 12 1

J. M. O'Reilly's, Assistant Secretary, travelling expenses to hold inquiry at Ballycotton 13 9 5
Stamping press - - - - - 6 12 6

Total - 149 14 0

Dublin Light Office, 1860.

J. HANKS, Accountant.

EXPENSES of COLLECTION.—Disbursement Account in the Four Quarters ending 31st December 1858.

Abstract H.

	£ s. d.
Cork, for the Quarter ending 31st March	33 6 3
Limerick " " 30th June	48 9 7
Sligo " " 30th September	39 1 10
Wexford " " 31st December	142 16 0
	263 13 8

Port of Dublin Corporation, 1860.

J. HANKS, Accountant.

SUPERANNUATION ALLOWANCES.—Disbursement Account in the Four Quarters ending 31st December 1858.

Abstract I.

Date.	Weekly.	Quarterly.				Amount.
		Late Pay Clerk.	Of Lightship Service.	Lightkeepers.	Adults and Children.	
For Quarter ending 31st March	£ s. d. 21 2 6	£ s. d. 4 3 4	£ s. d. 87 12 11	£ s. d. 49 8 7	£ s. d. 33 14 4	£ s. d. 186 1 8
" " 30th June	16 12 6	- - -	- - -	67 3 11	33 4 4	117 0 9
" " 30th September	11 7 6	2 1 8	44 3 5	67 11	32 9 4	157 7 10
" " 31st December	12 3 0	4 3 4	86 0 1	67 1	32 4 4	201 16 8
						627 6 11

Port of Dublin Corporation, 1860.

J. HANKS, Accountant.

XI. XII. XIII. CONSTITUTION OF GENERAL AUTHORITY, &c.
ACCOUNT OF DISBURSEMENTS FOR NEW WORKS in the
Four Quarters ended 31st December 1858.

Abstract L.

Arran Island, North	£	s.	d.	
South	588	4	1	
Black Rock, Black Sod Bay	279	6	1	
Dunscarvan	534	4	5	
Fastnet	171	2	2	
Newcastle	2	13	8	
Calif Rock	47	13	9	
Rathlin Island	83	3	9	
Rock-a-Bill	2,884	16	8	
Loughswilly		0	6	4
		<hr/>		5,185 10 8
Star	£243	0	6	
Brilliant	0	5	0	
		<hr/>		243 5 6
The Midge	4,253	8	5	
New Buoy Store		30	3	0
		<hr/>		Total 9,694 7 7

Office, Fort Dublin Corporation, 1860.

J HANKS, Accountant.

XII.

The accounts, both of the Receipts and Disbursements, are transmitted to this Corporation by their accountant quarterly.

Are audited quarterly by a Committee of this Corporation. Are transmitted quarterly to the Board of Trade, who audit them.

And the Board of Trade then transmit them to the Board of Audit for final adjustment.

J. HANKS,
Accountant of this Corporation.

Office, Port Dublin Corporation,
January 1860.

XIII.

The system employed in conducting the financial department of the establishment, &c.

The light dues in Ireland have always been received by the collectors of customs or their deputies at the various ports and creeks, and are remitted in bills or letters of credit on the Bank of Ireland, to this office, and are subsequently lodged to the credit of the Corporation's Revenue account, which, when it accumulates to 1,000*l.* or upwards, is drawn upon and the amount remitted by the Bank of Ireland, to be placed to the credit of Her Majesty's Paymaster-General, on account of the Mercantile Marine Fund.

With respect to obtaining money, an annual estimate under the several heads of expenditure is submitted to the Board of Trade, on which they sanction advances by the Paymaster-General to meet the necessary expenses; these advances are made through the Bank of Ireland, and are placed to the credit of the "drawing account." The demands from contractors, workmen's accounts, and bills for articles supplied, are submitted to the Board, and, if found certified by the proper officers, and in every way correct, are initiated by the chairman, and passed for payment; a draft signed by three members is then issued for the total amount of the bills, and the chief clerk makes payments accordingly, taking the proper receipts; and no

payments whatever are made except by draft issued by the Board in the manner already stated.

The accounts are subsequently submitted to one or more members of the accounts' committee, when they are examined, and, if found properly vouched, are initiated, and the result is reported to the Board, and a record of the fact placed upon their proceedings.

At termination of each quarter the accounts and vouchers are forwarded to the Board of Trade, where they are again minutely examined, and finally transmitted to the Audit Board as a portion of the expenditure of the Mercantile Marine Fund.

XIV.

Names, ages, dates of appointment, and salaries of the persons comprising the establishment of the office, &c., duties, &c.

Year to September 1859.

Name.	Age.	Date of Appointment.	Title of Office.	Salary.		Total.
				Lighthouse Account.	Port Account.	
*Geo. Halpin	50	1830	Superintendent.	533 6 8	266 13 4	800 0 0
†Wm. Lees	34	1852	Secretary	205 13 4	103 6 8	310 0 0
J. M. O'Reilly	37	1854	Assistant Do.	125 13 4	63 6 8	190 0 0
H. Vereker	66	1823	Chf. Clerk Accountant.	433 6 8	166 13 4	600 0 0
J. Haaks	66	1826	Do.	283 6 8	116 13 4	400 0 0
‡E. F. Roberts	41	1853	Marine Inspector.	300 0 0	- -	300 0 0
J. Cossart	51	1826	Examiner of Light Dues.	210 0 0	90 0 0	250 0 0
R. Crooke	62	1827	Assistant Do.	180 0 0	20 0 0	200 0 0
Wm. Hanks	56	1828	Do. do.	180 0 0	20 0 0	200 0 0
J. Brownrigg	65	1842	General Clerk.	30 0 0	90 0 0	120 0 0

* The superintendent is allowed 100*l.* a year in lieu of residence, in addition to his salary.

† The secretary is allowed 150*l.* a year in lieu of residence, in addition to his salary.

‡ The marine inspector is solely employed in the lightship and buoy department.

The officers are daily employed in the services of both "lighthouses" and "port." In 1853 this subject was closely investigated by the Board of Trade, and their lordships decided that the port duties might be considered as about one third of the whole; the establishment was then regulated by an Order in Council on that principle, and all appointments since made have been in accordance with this rule.

XV.

Mode of selecting and appointing the officers.

When vacancies occur in the establishment, a reasonable time is given for all applications to be made to the Board, and advertisements in some cases inserted in the public papers, the Board are then specially summoned, and after due examination of the parties and their testimonials they select the names of the most eligible of the candidates (usually three), and proceed to a ballot. The party having the majority of votes is appointed, subject to the approval of the Lord Lieutenant (see 26 Geo. 3, c. 19, s. 9.) and the Board of Trade.

IRELAND.

Circular I.
Question XIII.

XIV.

XV.

IRELAND. Circular I. Question XVI.	XVI.		CONSTITUTION OF GENERAL AUTHORITY, &c.				XVI.		
	List of Persons in receipt of Allowances for Pensions or of Superannuation.	Ages.	Date of Superannuation.	Length of Ser- vice.	Reason assigned for putting them on Retired List.	Rate per Annum.	Amount of Superannuation paid.		
							1857.	1858.	
	Years.				£ s. d.	£ s. d.	£ s. d.		
Geo. Gregory	73	30 July 1852	—	33 years' service as light-keeper, and infirmity.	43 1 6	43 1 4	43 1 4		
Thos. Lynn	66	19 Aug. 1852	—	25 years' service as light-keeper, and infirmity.	37 13 10	37 13 8	37 13 8		
Jno. Hinton	69	20 Nov. 1855	—	30 years' service as light-keeper; impaired health.	43 1 6	43 1 4	43 1 4		
Thos. Weldon	—	26 Aug. 1852	—	Aged lightkeeper	43 1 6	43 1 4	43 1 4		
Josh. Landers	71	23 Dec. 1852	—	30 years' faithful service, and infirmity.	21 10 9	10 15 4	—		
Rich. Fleming	—	7 Aug. 1845	—	Old age and infirmity	43 1 6	10 5 1	—		
Peter Redmond	—	13 Nov. 1857	—	Aged lightkeeper	48 0 0	—	42 7 10		
Jno. Prendergast	—	23 Dec. 1857	—	lightkeeper at Fan-net Point Lough Swilly.	53 18 0	—	41 14 10		
Fraser J. Turner	72	14 July 1853	—	17 years' service; infirmity.	40 0 0	30 0 0	50 0 0		
Rich. Foster	—	17 Nov. 1854	—	—	37 16 0	28 7 0	47 5 0		
Thos. Cullen	67	21 Dec. 1854	—	31 years' service; old age and bad health.	71 4 2	53 8 0	80 17 6		
Bridget Byrne	—	18 Feb. 1856	—	Widow of L. Byrne, killed at lightship, Arklow.	6 0 0	4 10 0	7 10 0		
Lawrence Byrne	7	" "	—	Child of ditto	3 0 0	2 5 0	3 15 0		
Thos. Byrne	5	" "	—	" " "	3 0 0	2 5 0	3 15 0		
Joseph Byrne	3	" "	—	" " "	3 0 0	2 5 0	3 15 0		
Mary Byrne	3 months	" "	—	" " "	3 0 0	2 5 0	3 15 0		
Edw. Battersby	—	27 Aug. 1856	—	Hurt severely on board lightship.	13 9 0	10 1 9	4 2 11		
Jas. Forsyth	—	11 June 1858	—	Mate in lightship service.	48 6 0	—	13 3 0		
Chas. Hunter	—	16 May 1850	—	Old age, long service, and unable to work.	26 0 0	26 0 0	26 10 0		
Denis Toomey	—	24 Feb. 1853	—	Ruptured on board lightship; 16 years' service.	13 0 0	13 0 0	13 5 0		
Thomas Mitton	80	2 Dec. 1856	—	52 years' service, old age, and loss of sight.	39 0 0	39 0 0	15 0 0		
Anne J. Proud	—	29 June 1857	—	Widow of foreman of works.	6 10 0	3 3 7	6 12 6		
Edw. A. Gibbon (formerly Pay Clerk, &c.)	70	3 June 1842	—	42 years' faithful service, and 70 years old; declining health.	8 6 8	6 5 0	10 8 4		
Eliz. Bishop	34	27 Nov. 1812	—	Loss of husband, W. Bishop, at Tuskar.	5 10 8	5 10 8	5 10 8		
Mary Cane	30	16 Feb. 1826	—	Husband, P. Cane, blown up at Skelligs.	5 10 8	5 10 8	5 10 8		
Anne Walsh	—	7 Feb. 1833	—	Son, John Walsh, killed at Slyne Head.	6 0 0	6 0 0	6 0 0		
M. Conroy	—	28 July 1836	—	Husband drowned at Slyne Head.	6 0 0	6 0 0	6 0 0		
Mary Rivitt	—	27 Sept. 1838	—	Husband, W. Rivitt, drowned at Slyne Head.	6 0 0	6 0 0	6 0 0		
Anthony Devitt	38	16 Nov. 1837	—	Disabled at Eagle Island.	6 6 0	6 6 0	6 6 0		
Anne Polly	—	3 Sept. 1840	—	Widow of Jno. Polly, who had been 50 years' lightkeeper.	6 0 0	1 10 0	—		
Eliz. Cullen	—	17 " 1840	—	Husband, D. Cullen, drowned at Arran Island.	6 0 0	6 0 0	6 0 0		
Anne Butler	—	15 Oct. 1840	—	Widow of A. Butler, killed at Kinsale.	6 0 0	6 0 0	6 0 0		
Catherine Lake	—	7 Jan. 1841	—	Widow of E. Lake, who died suddenly at Tuskar.	6 0 0	6 0 0	6 0 0		
Mary Browne	—	4 Mar. 1841	—	Widow of H. Browne, upwards of 40 years in service.	6 0 0	6 0 0	6 0 0		
Mich. Meehan	—	1 July 1857	—	Blinded whilst white-washing Tory Island lighthouse.	6 10 0	2 14 2	6 10 0		
Pat. Browne	3 months	4 Mar. 1841	—	Child of H. Browne, 40 years in service.	—	0 5 0	—		
Wm. Thullier	1	18 Aug. 1842	—	Child of J. Thullier, lamp fitter, who served faithfully 19 years.	3 0 0	2 5 0	—		
Cathie. Whelan	—	15 Jan. 1846	—	Widow of Thomas Whelan, who served faithfully 25 years.	6 0 0	6 0 0	6 0 0		
Pat. Redmond	5	25 Mar. 1847	—	Child of E. Redmond, who served 38 years.	3 0 0	3 0 0	1 0 0		
Mary Anne Redmond	—	" "	—	Child of ditto	3 0 0	3 0 0	3 0 0		

XVI.

CONSTITUTION OF GENERAL AUTHORITY, &c.

XVI.

List of Persons in receipt of Allowances for Pensions or of Superannuation.	Ages.	Date of Superannuation.	Length of Service.	Reason assigned for putting them on Retired List.	Rate per Annum.	Amount of Superannuation paid.	
						1857.	1858.
						£ s. d.	£ s. d.
Teresa O'Halloran.	—	28 Mar. 1850	—	Child of E. O'Halloran; 24 years' faithful service.	3 0 0	3 0 0	3 0 0
Eliz. Connor	—	20 Jan. 1853	—	Husband, Thos. Connor, lightkeeper, drowned at Slyne Head.	6 0 0	6 0 0	6 0 0
Mary Connor	10	" "	—	Child of ditto	3 0 0	3 0 0	3 0 0
Arthur Connor	8	" "	—	" "	3 0 0	3 0 0	3 0 0
Thomas Connor	5	" "	—	" "	3 0 0	3 0 0	3 0 0
Jane Connor	3	" "	—	" "	3 0 0	3 0 0	3 0 0
William Connor	8 months	" "	—	" "	3 0 0	3 0 0	3 0 0
Monica King	—	10 Oct. 1853	—	Widow of boatman drowned at Slyne Head.	6 0 0	6 0 0	6 0 0
Anne King	11	" "	—	Child of ditto	3 0 0	3 0 0	1 15 0
Mary King	8	" "	—	" "	3 0 0	3 0 0	3 0 0
Thomas King	6	" "	—	" "	3 0 0	3 0 0	3 0 0
Martin King	4	" "	—	" "	3 0 0	3 0 0	3 0 0
Bridget King	2	" "	—	" "	3 0 0	3 0 0	3 0 0
Mary Joyce	—	22 Oct. 1852	—	Widow of boatman drowned at Slyne Head.	6 0 0	6 0 0	6 0 0
Barbara Joyce	2	" "	—	Child of ditto	3 0 0	3 0 0	3 0 0
Anne D'Arcy	7	" "	—	Child of boatman drowned at Slyne Head.	3 0 0	1 15 0	—
Martin D'Arcy	5	" "	—	Ditto - ditto	3 0 0	3 0 0	3 0 0
						547 9 11	672 6 11

IRELAND.
Circular I.
Question XVI.

Office, Port Dublin Corporation,
1st July 1859.

J. HANKS,
The Accountant of this Corporation.

XVII.

No local agents employed by the Port of Dublin Corporation.

BALLAST OFFICE, DUBLIN.

IRELAND.

Office, Port of Dublin Corporation,
February 9, 1860.

XVIII. XIX. XX. XXI.

The Port of Dublin Corporation do not manage their lighthouses round the coast of Ireland by divisions or "districts," and are not the owners of any of the boats employed at the lighthouses which require boat attendance, being only owners of the "Midge," screw steamer of 45 tons, with a crew of 12, master, mate, engineer, and 9 men.

The total expense of which, for wages, maintenance, &c., commenced in September and December quarter 1858, 457*l.* 8*s.* 9*d.*, and for year 1859, 1,275*l.* 7*s.* 5*d.*

The expense incurred in each year since 1853, in the hire of boats at lighthouses, and is included in *General Maintenance*,—

	£	s.	d.
1854	-	-	1,213 19 1
1855	-	-	1,138 12 7
1856	-	-	1,363 4 11
1857	-	-	1,549 19 4
1858	-	-	1,590 17 11

Accountant's Office.

J. HANKS.

XVIII.
XIX.
XX.
XXI.

CONSTITUTION OF GENERAL AUTHORITY, &c.
XXII. XXIII. XXIV. XXV. XXII. XXIII. XXIV. XXV.
STATEMENT OF LIGHTHOUSE KEEPERS appointed since 1854.

IRELAND.
Circular I.
Questions
XXII.
XXIII.
XXIV.
XXV.

Names of Lightkeepers.	Dates of Appointment.	Age when appointed.	Previous Employment.	Actual Employment when appointed.	By whom selected.	Mode of Examination, if any.
Thomas Moore	- 1854	18	Occasional temporary keeper, being son of a lightkeeper.	Answers in previous column applicable to this.	Selected and recommended to Board by Superintendent of Lighthouses.	The general usage is that the person selected to be a lightkeeper appears before the Board, when such questions are put to him as the Commissioners judge proper. Letters of recommendation are submitted, also testimonials of character from clergymen and magistrates of the locality in which the applicants have resided. In all cases a knowledge of reading, writing, arithmetic, and a moderately good education is held indispensable.
Richard Stapleton	- 1854	21	Do.			
William Legge	- 1854	44	Builder.			
Michael Power	- 1854	20	Boatman at lighthouse works.			
John Young	- 1854	18	Occasional temporary keeper, being son of a lightkeeper.			
Francis Dunne	- 1854	37	Messenger in Ballast Office.			
Michael O'Donnell	- 1855	19	Occasional temporary keeper, being son of a lightkeeper.			
Robert Phelan	- 1855	18	Do.			
Daniel Somers	- 1855	21	Tradesman in service of Port of Dublin Corporation.			
Charles Page	- 1855	19	Occasional temporary keeper, being son of a lightkeeper.			
John Whelan	- 1856	20	Do.			
William Brownell	- 1857	19	Do.			
Robert Redmond	- 1857	26	Tradesman in service of Port of Dublin Corporation.			
George Kelly	- 1857	46	Do.			
Henry Gardener	- 1857	28	Occasional temporary keeper, being son of a lightkeeper.			
John Donlevy	- 1857	38	Coast guard service, and afterwards watchman during building of Dundalk Lighthouse.			
Joseph Monks	- 1857	27	Hosier and occasional temporary keeper, being son-in-law of lightkeeper.			
Patrick Keenan	- 1858	22	Tradesman in service of Port of Dublin Corporation.			
William Callaghan	- 1858	27	Do.			
Jervis Brownell	- 1858	19	Occasional temporary keeper, being son of a lightkeeper.			
Thomas Redmond	- 1858	22	Do.			
James Williams	- 1859	21	Do.			
Thomas Reilly	- 1859	23	Do.			
John McKenna	- 1860	20	Do.			

Ballast Office, Dublin, November 1860.

GEORGE HALPIN,
Superintendent of Lighthouses.

RETURN OF MASTERS appointed to the Command of Lightvessels of the Port of Dublin Corporation since the 1st of January 1854.

NAME.	Date of Appointment as Master.	Age at the time of Appointment.	Employment previous to joining Service of Corporation.	Actual Employment when promoted to Master.	By whom selected as Master.	Mode of Examination, if any.
Alexander Crichton	1 Jan. 1855	47	In North American trade.	Mate of the Kish Bank lightvessel.	Recommended by Marine Inspector.	Having served as mate in a lightvessel for 21 years, an examination for master was not considered necessary, as the duties of master and mate are similar, they having charge alternately each month.
William Braden	1 Sept. 1857	47	Master of a merchant vessel trading to Bordeaux.	Mate of the Arklow Bank lightvessel.	Recommended by Marine Inspector.	Having served as mate of a lightvessel for 15 years, an examination for master was not considered necessary. <i>Note.</i> —No person is appointed mate of a lightvessel unless he has previously passed for mate before the Mercantile Marine Board.

E. F. ROBERTS, Commander, R.N., Marine Inspector.

XXVI. In 1844, Mr. Halpin, the present superintendent of lighthouses, suggested a mode of distinguishing the light then about to be exhibited at St. John's point, Dundrum Bay, by an apparatus for making it intermittent. This was accomplished, and was the first of the kind introduced in Great Britain, although a different arrangement of intermittent apparatus had previously been used in Scotland by Mr. Stephenson.

Some modification of this plan has since been adopted in Ireland and elsewhere, in such positions as a difficulty was found in distinguishing lights from each other.

In 1851, Mr. Babbage proposed what he called his "numerical system," but as the plan suggested was not considered so effective, in some respects, as the distinction attainable by revolving or flushing lights, it was not adopted.

CIRCULAR NO. II.—LIGHTHOUSES.—GENERAL RETURN.

IRELAND.
Circular II.

I. Port of Dublin Corporation Ballast Office, Dublin.

II. A Book of Charts showing the positions of the several Lighthouses sent herewith. A special Return for each Lighthouse has already been forwarded to the Royal Commission.

Poolbeg.
Kingston, West.
Kingston, East.
Wicklow, Lower.
Wicklow, Upper.
Tuskar.
Hook Tower.
Duncannon Fort.
Duncannon, North.
Dunmore.
Dungarvan.
Minehead.
Youghal.
Ballycotton.
Cork.
Spjthank.
Charlesfort.
Kinsale.
Fastnet.
Crookhaven.
Bearhaven.
Skelligs, Lower.
Skelligs, Upper.
Valencia.
Sampshire Island.
Loophead.
Kilredann.
Tarbert Rock.
Beeves Rock.
Aran Island, South.
Aran Island, North.
Mutton Island.
Slyne, South.
Slyne Head, North.
Clare Island.
Inishgart.
Eagle Island, West.
Eagle Island, East.
Broadhaven.
Black Rock.
Oyster Island, South.
Oyster Island, North.
Killybegs.
Killybegs Harbour.
Rathlin O'Birne.
Tory Island.
Loughswilly.
Inishtrahull, Upper.
Inishowen, West.
Inishowen, East.
Rathlin Island.
Maidens, North.
Maidens, South.
Larne.
Copeland.
Donaghadee.
South Rock.
Ardglass.
St. John's Point.
Carlingford.
Carlingford Lough.
Dundalk.
Drogheda, North.
Do. do.
Drogheda, East.
Drogheda, West.
Rockabill.
Balbrigan.
Howth Pier.
Howth Baily.

III. General principles which regulate the choice of site for lighthouses are those now generally adopted by other lighthouse authorities. The selection for sea lights the most salient points are selected, such as Inishtrahull Island, Tory Island, Slyne Head, Rathlin Island. Off shore rocks, as Skelligs Rock,

Fastness Rock, Tuskar Rock, Rockabill, Maiden's Rocks, especially when such sites are available for guidance along a line of coast, and in approaching its principal harbours. In harbours and channels of estuaries, or of navigable rivers, selection is made of sites most useful in guiding safely through the channels, and in marking tidal rocks and other dangers, as Tarbert Rock, Beeves Rock, &c.

- V. It is generally considered inexpedient to exceed heights of from 150 to 200 feet. Elevated positions are frequently liable to be obscured by fogs. It has, however, in a few cases been found necessary to exceed the heights of 200 and even 300 feet over the sea.
- VI. The description of apparatus heretofore used in the lighthouses of Ireland have been the catoptric, catadioptric, and dioptric. Different modification of arrangement being practicable with each description of apparatus named.
- VII. Selection of the particular description of illuminating apparatus adopted at each site is made according to the distance at which it is required that the light should be seen, the portion of the circle to be lighted, the distinctive character of lights previously established on the same coast, and from which the new light to be established should be strongly distinguished.
- VIII. Different characters of illuminating apparatus employed:—fixed, revolving, flashing, intermitting, with modification. Some of the flashing lights might be termed fixed, varied by flashes, in cases in which the upper and lower tiers of prismatic zones are fixed, and the flashes produced by the motion of the polygonal lenses; but in such cases the peculiar character is the flash.
- IX. In modern lights the general principles which govern the selection of the character of illuminating apparatus have been based on the requirements of the case in each instance, as—the distance to which it would be useful that the light should be seen, the number and character of neighbouring lights previously established, the adoption of a distinctive character readily distinguishable with certainty.
- X. Drawing or tracing of each description of illuminating apparatus used has been prepared.
- XI. Copy of table has been filled.
- XII. All the important lighting stores (as indeed most other stores are supplied by open contract, as lamp oil, rapeseed, or colza), lamp glasses, cotton wicks, The lamp oils are tried by burning in lamps, examination of specific gravities, running through tube of small diameter, dropping of acids on their films of the oil tried,—trials by burning and by gravities, and with alcohol, being the most ready and certain. Ordinary stores are usually supplied by open contract, as coals, timber, and articles used in repairs of lighthouses.
- XIII. The only fog-signals heretofore used in the lighthouses under management of this corporation have been fog bells struck by machinery worked by weights. Gongs have been used in the light-vessels of the corporation.
- XIV. The only tide signals used have been half-tide signals, as at Rollbeg and Carlingford. During day time signal balls being raised at half-flood, and kept up until half-ebb, when they are lowered. During night, half-tide lights are shown at nearly mid height of the tower.
- XV. Merchants and others at Strangford, co. Down, memorial for a light on "Rock Angus," at the entrance to that Lough.—1846.
- Corporation reply that a beacon is about to be erected there, which it is hoped will answer the purpose.—1846.
- Beacon since erected.
- Cork Harbour Commissioners apply for a light on "Cable Island," co. Cork.—January 1846.

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Board resolve to erect one there, March 1846. Commissioners informed accordingly.

Ship owners and others at "Tralee," memorial for a harbour light on "Sapphire Island."—June 1846.

Since erected.

Inhabitants of "Dingle" apply for a light at that harbour.—October 1846.

Not complied with.

Dundalk Harbour Commissioners apply for two lights at the entrance of that bay.—January 1846.

Trial screw pile-driver at the entrance of harbour 1848; and light since exhibited there, 1855.

Inhabitants near Broadhaven, memorial for a light at that place.—October 1846.

Beacon tower erected, and since converted into a lighthouse, and light exhibited 1855.

Lord Monteaige applies for a light at "Foynes," River Shannon.—November 1846.

After due consideration it was decided to erect a light on "Beave's Rock" instead of at Foynes, March 1847. Limerick Harbour Commissioners informed accordingly.

Light since erected.

Londonderry Harbour Commissioners apply for a light on "Rathlin-o-birne."—October 1846.

Board resolve to erect a lighthouse there, January 1847. Commissioners informed accordingly.

Lighthouse since erected.

Lord Courtown applies for a light at Courtown Harbour, co. Wexford.—September 1847.

Not complied with, being purely local.

Relief Committee at Dingle apply for a light at that harbour.—December 1847.

Not complied, being solely for local purposes.

Cork Harbour Commissioners apply for lights at "Ballycotton and Ballymacraut Head," co. Cork.—February 1848.

Board resolve to erect lighthouses on Ballycotton, Minehead, and Youghal. Parties informed accordingly, April 1848.

All three lights since exhibited.

Lord Bernard forwards memorial from parties praying for a light on "Gally Head," co. Cork, 1848.

Consideration postponed.

Application from parties in the vicinity of Newcastle for a light on the pier of that harbour.—July 1848.

Small lighthouse erected.—1849.

Mr. Giles forwards application for a light at Dungarvan.—1848.

Informed that Board will erect one there.—November 1848.

Since erected.

XV.

	Income.			Expenditure.		
	£	s.	d.	£	s.	d.
1845	61,295	7	1	35,582	17	1
1846	58,635	11	2	42,815	2	5
1847	60,105	8	3	47,098	9	6
1848	54,817	4	2	56,354	12	1
1849	62,366	11	10	63,982	6	7
1850	55,031	3	9	58,003	15	6
1851	60,469	19	2	73,059	15	1
1852	58,168	6	1	62,395	13	10
1853	76,200	2	11	65,958	4	2
1854	47,977	17	0	57,397	13	9
1855	32,083	17	9	43,840	3	10
1856	14,734	17	11	48,355	18	7
1857	13,288	11	7	48,768	6	1
1858	15,526	3	8	46,658	2	3

XVI. With respect to light apparatus, actual trial of the apparatus, examination of the parts, comparison with apparatus procured from the same or other manufacturers, regard being chiefly had as to the practical effect at various ascertained distances, and as viewed from seaward.

XVII. This corporation apply for power to construct a lighthouse at "Straw Island," "Galway Bay."—4th November 1854.

Board of Trade refuse to sanction, on the grounds that the benefit would be purely local.—29th November 1854.

This board recommend the establishment of

lights at "Calf Rock," "Black Rock," and "Foze Rock."—January 1857.

Board of Trade sanction the two first-named, but defer consideration of the latter to a future day.—June 1857.

This corporation recommend the modification of the lights at St. John's Point, Kish, Arklow, and Blackwater Bank, on the exhibition of Rock-a-Bill light.—January 1859.

Board of Trade comply.—March 1859.

This board recommend the re-establishment of the suppressed light at "Aranmore," county of Donegal, and the modification of the lights at Tory and "Rathlin-a-beirne" islands.—June 1859.

Board of Trade comply.—November 1859.

XVIII. Copies of regulations and copies of printed forms in use relating to lighthouses have been collected.

XIX. The Port of Dublin Corporation, since vested with control of the lighthouses in Ireland in 1811, have in better positions built new lighthouses in lieu of most of the old lighthouses erected by the Revenue Board, as Howth Baily, Wicklow, Old Head of Kinsale, Fastness Rock, in lieu of Old Cape Clear light, Loophead, Aran, two lights at extremities of the chain of islands in lieu of the old light on summit of the Great Aran Island, and have constantly endeavoured to procure the best and most modern apparatus, as will appear on comparison of some of the dioptric apparatus last erected with that of earlier date.

Reference to the accompanying book of charts and to the special returns will explain, by examples, the general principles adopted in selecting sites for lighthouses, and different character of illuminating apparatus employed.

XIX. In reply to Queries No. 19, in General Lighthouse and No. 20, in General Floating Light Return, and as directed by letter No. 702, 11th June 1859.

Subjects of correspondence with the Trinity Board or Board of Trade, in which requests, suggestions, or remonstrances have been made by the Port of Dublin Corporation on subjects which they have considered of importance to the interests in their charge, but on which the views enforced by them have not met with the concurrence of these departments.

This corporation recommend the establishment of a light on Straw Island, Galway Bay.—4th November 1854.

Board of Trade refuse to sanction the expense, on the grounds that the benefit would be only local.—29th November 1854.

This corporation again apply for a light on Straw Island, Galway.—30th December 1854.

Board of Trade refuse to sanction, for reason before stated.—8th January 1855.

This corporation apply for leave to place a fog bell at Dundalk lighthouse.—16th February 1856.

Board of Trade refuse to sanction expense, being for local purposes.—11th March 1856.

The corporation apply for the permanent use of a steamer.—23d August 1856.

Board of Trade refuse to sanction.—15th September 1856.

This corporation recommend the establishment of a light on "Gally Head," S.W. coast of Ireland, in connection with other lights.—10th March 1857.

Trinity House will not agree to recommend to Board of Trade as a passing light.—4th April 1857.

This corporation apply, by a deputation to Board of Trade, for the permanent use of a steamer.—9th July 1857.

Board of Trade refuse to sanction.—9th July 1857.

A similar application by a deputation is made in March 1858.

Board of Trade again refuse to sanction.—March 1858.

This corporation recommend the better marking of the approaches to Galway.—9th October 1858.

Board of Trade refuse to sanction expense, on the grounds of the benefit being purely local.—16th October 1858.

This corporation recommend that the "Tun Bank" buoys (Londonderry) should be taken

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LIGHTHOUSES.—GENERAL RETURN.

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under their jurisdiction, being outside the limits of the jurisdiction of the harbour authorities.—27th August 1859.

Board of Trade refuse to sanction unless a charge be made on shipping for their maintenance.—8th November 1859.

This corporation recommend the substitution of dioptric for catoptric apparatus at Tory Island, Roches' Point, and Copeland Island.—22d October 1859.

Board sanction expense at Tory Island, but refuse to sanction at Roches' Point or Copeland Island.—1st November 1859.

This corporation recommend (again) the placing of a fog gun on board the "Kish" lightship.—22d November 1859.

Board of Trade adhere to former opinion, and refuse to sanction.—3d December 1859.

This corporation recommend the placing of a light on Straw Island, Galway Bay.—25th November 1859.

Board of Trade sanction only on condition that the local authorities contribute two thirds of cost of its maintenance.—24th December 1859.

This corporation recommend (through the Trinity Board) the placing of a fog gun on board the "Kish" lightship.—19th February 1859.

Board of Trade refuse to sanction, on the grounds of additional expense, and that *it might be mistaken for the gun at Holyhead*, but suggest that a bell, in lieu of the gong, be substituted if the latter be found insufficient.—18th April 1859.

This corporation recommend that the sum of 15*l.* should be contributed towards the expense of the pier near the lighthouse at "Larne," which is a great convenience to the lightkeepers.—15th August 1859.

Board of Trade refuse to sanction, on the grounds that the benefit would be local.—3d September 1859.

This corporation recommend the placing of a light on the "Spit of Passage," and a beacon on the "Falskirt Rock, Waterford," to enable vessels to take shelter in the harbour.—6th December 1859.

Trinity Board refuse to recommend to Board of Trade, being, as they state, more for local than general purposes.—14th December 1859.

This corporation again apply for a light on Straw Island, Galway Bay.—11th February 1860.

Board of Trade adhere to their former decision, viz., that the local authorities should contribute two-thirds towards its maintenance.—22d February 1860.

This Corporation recommend the placing of a beacon to mark the "Pladdy Lug," Lough Strangford.—May 1858.

Board of Trade refuse to sanction, being purely for local benefit.—June 1858.

Lord George Hill applies to have "Gweedare" Harbour marked.—July 1854.

Board of Trade refuse on the ground that the benefit would be purely local.—August 1854.

CIRCULAR NO. III.—LIGHTHOUSES.—SPECIAL RETURN.

The numbers to the Answers correspond to the Arabic numbers at the Questions in Circular III.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

129.

POOLBEG.

East Coast of Ireland, on outer End of South Pier, Dublin Harbour.

Lat. $50^{\circ} 20' 30''$, Lon. $6^{\circ} 9' 16''$ W.

3. Port of Dublin Corporation.
4. Two lights, an upper and a lower; the lower light is a half-tide light.
5. Not ascertained.
6. Not ascertained.
7. To guide from seaward into Dublin Bay, and to light from the Kish Bank to the bar through the Bar Channel, and within inner reach of the Harbour Channel.
8. 1768.
10. Harbour light.
11. Cut stone tower, solid walling, of circular form, coloured white.
12. No separate external conductor.
13. 63 feet.
14. 68 feet.
15. 8 miles.
16. 12 miles.
17. 225° S. W. $\frac{1}{2}$ S. to W. N. W.
18. Fixed; light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. Two fog bells struck by machinery.
27. 22 days.
28. 22 days.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high, *l*.
32. Not purchased.
33. *l*. 15s. 6d.
34. Coated with paint once every year, 51*l*. 9s. 1d. Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 6*l*. 12s. 4d., one at 4*l*. 3s.
37. 1857, repairs, 1*l*. 8s.; cylinders, 7*l*. 4s.; cleaning stores, 2*l*. 3s. 4d. 1858, repairs, 1*l*. 10s.; cylinders, 7*l*. 4s.; cleaning stores, 2*l*. 3s. 4d.
38. 1857, oil, 970 gallons; wicks, 15 gross. 1858, oil, 1,037 gallons; wicks, 15 gross.
39. Pale rapeseed oil. 1857, 4s. 2½*d*. per gallon. 1858, 3s. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3s. 6*d*. per gross; 2*l*. 12s. 6*d*. total cost. 1858, 3s. 6*d*. per gross; 2*l*. 12s. 6*d*. total cost.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
48. 1852, quarter, nil.
44. 1852, 857*l*. 6s. 8*d*. 1858, 885*l*. 4s. 1*d*.
45. None.
46. None.
47. None.
48. No representation made as to the light being unnecessary, or placed in an unsuitable position.
49. None.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. Inspected on several occasions in 1857. Ditto, in 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining lighthouse.
54. None in 1858.
55. Light shown in lower lantern in tower from half-flood to high water, and from high water to half ebb. Black ball borne on staff, raised and shown during same periods of tide.
56. No other night signals than the tide signals are used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, mid-night. Keepers changed from the station as changes from other lighthouses require and allow.

130.

KINGSTOWN, WEST.

East Coast of Ireland, Centre of West Pierhead.

3. No local authority.
4. One light. There is a revolving light on the east pierhead, which is the principal light of the harbour, and for which there is a special return.
5. Lights on pierhead formed part of the original design for harbour.
6. Commissioners of Kingstown Harbour.
7. As being the centre of west pierhead, and best position subsidiary to the east pier light to define limits of entrance of harbour.
8. 1845.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation, Superintendent of Lighthouses. Built under his direction by workmen of the Corporation, and not by contract.
10. Harbour light.
11. Cut stone, solid walling, tower is circular, its shaft of the natural colour of the stone (granite), dome coloured white.
12. No separate external conductor. Central metal column and metal stairs forms a continuous conductor from top to base of tower.
13. 29 feet.
14. 36 feet.
15. 6½ miles.
16. 4 miles.
17. 270°.
18. Fixed.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 4th order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None.
27. None.
28. None.
- 29.
30. Finished.
31. Lantern sash 2 feet in diameter, 8 feet high, *l*.
32. Not purchased.
33. 2*l*. 15s. 6*d*.
34. Coated with paint once every year, 19*l*. 3s. 5*d*. Paints procured by contract; workmanship not by contract.
35. One keeper at 4*l*. 6s.
37. 1857, cylinders, 18s.; cleaning stores, 10s. 10*d*. 1858, cylinders, 18s.; cleaning stores, 10s. 10*d*.
38. 1857, oil, 56 gallons; wicks, 1 gross. 1858, oil, 54 gallons; wicks, 1 gross.
39. Pale rapeseed oil. 1857, 4s. 2½*d*. per gallon. 1858, 3s. 5*d*. per gallon.
40. Argand cotton wick. 1857, 3s. 6*d*. per gross. 1858, 3s. 6*d*. per gross.
41. None.
42. From Mercantile Marine Fund.
43. For No. 43 see Kingstown East. Two lights charged as one.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Board, and by the Superintendent of Lighthouses.
51. From proximity of the lighthouse to Dublin, often inspected during every year.
52. Not known to have been extinguished.
53. Spare lamp and burner kept. Oil stored in oil store at light-keeper.
54. None in 1858.
55. No tide signals used; no application made to have them used. The harbour is navigable at low water by the class of steamers and vessels which resort there.
56. No night signals used; not found requisite.
57. One keeper.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

131.

KINGSTOWN, EAST.

East Coast of Ireland, on Centre of East Pierhead.

Lat. 53° 18' N., Lon. 6° 8' W.

3. No local authority.
4. One light.
5. Light determined on as a necessary part of the plan for Kingstown Harbour.
6. Light on the pierhead was proposed by the engineer of Kingstown Harbour.
7. To guide from seaward to Kingstown Harbour, and to light the entrance between the pierheads, and for guidance within the harbour.
8. 1822 (first old light, since removed).
9. Present lighthouse and dwellings designed by late George Halpin, Engineer to Port of Dublin Corporation, built from his designs by Mr. Muller, contractor under Board of Works for Kingstown Harbour Works. Lantern erected by Port of Dublin Corporation.
10. Harbour light.
11. Cut stone; solid walling; tower and dwellings around of circular form. Since erection of lighthouse a battery has been built around pierhead, over which the upper part of lighthouse is visible.
12. No separate external conductor. Usual arrangement of wrought-iron handrail.
13. 41 feet.
14. 41 feet.
15. 7 miles.
16. 10 miles.
17. 304° S.E. $\frac{1}{4}$ E. to S. $\frac{3}{4}$ W.
18. Revolving, showing white and red lights alternately.
19. Strong light or flash appears every half minute; the red light, appearing once in every minute.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus.
24. Reflectors from the Soho Plate Company. Revolving machine by Gegg of Dublin. Wrought-iron frame by workmen of the Corporation.
25. Usual arrangement through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. Large fog bell struck by machinery. Fog bell is placed in a detached belfry.
27. 52 days.
28. 52 days.
29. Not ascertained; the building erected from the designs of the Engineer of the Port of Dublin Corporation, having been erected by Board of Works from funds granted for construction of the pier and harbour.
30. Finished.
31. Lantern sash, 8 feet diameter, 6 feet high. 489*l.* (including cut stone blocking.)
32. Not purchased.
33. 2*l.* 15*s.* 6*d.*
34. Coated with paint once every year, 19*l.* 3*s.* 5*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers at 46*l.* 3*s.* each.
36. Lighting apparatus, 237*l.*; machine, 127*l.*; 35*l.* Total, 399*l.*
37. 1857, repairs, 2*l.* 8*s.*; cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 2*s.* 8*d.* 1858, repairs, 7*l.* 12*s.* 11*d.*; cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 2*s.* 8*d.*
38. 1857, oil, 163 *g* 11*ons*; wicks, 5 gross. 1858, oil, 167 gallons; wicks, 5 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost.
41. Large bell, 229*l.*; machine, 170*l.*; belfry, &c. 214*l.* Total, 613*l.*
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 36*l.* 5*s.* 6*d.* 1858, quarter, 9*l.* 0*s.* 5*d.* Total for 1852, 145*l.* 1*s.* 11*d.*
44. 1858, 180*l.*
45. None.
46. None.
47. None.
48. No complaint or representation as to the light being unnecessary or in an unsuitable position.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. From proximity of the lighthouse, often inspected during every year.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store near to the lighthouse.
54. No one in 1858.
55. No tide signals used; no application made to have them used. The harbour is navigable at low water.
56. Signal mast and flag. No night signals used; not found requisite.
57. The keeper on watch relieved from the lightroom at 12 o'clock, midnight.

132.

WICKLOW, LOWER.

East Coast of Ireland, on the Point of Wicklow Head.

Lat. and Lon. as stated on Special Return for Wicklow, Upper.

3. No local authority.
4. One light in lower tower; distant from the Wicklow Upper Lighthouse 180 yards, bearing S.E. by E. $\frac{1}{4}$ E. The upper and lower lights kept in line lead through the Wicklow swash or channel between the banks.
5. Not ascertained; two old lighthouses, of which one tower is still left standing as a sea mark, were transferred from the Revenue Board in 1810. The Port of Dublin Corporation adopted present positions, farther out on Wicklow Head.
6. Not ascertained.
7. A coast light being requisite there, next southward of the Dublin Bay Lights, and as a fitting position for leading lights to guide through the Wicklow swash to the channel within the banks.
8. 1818, first exhibition of present lights.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation. Built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone tower; circular; built with solid walling; painted white externally. The two lights (upper and lower) mark the position by day.
12. No separate external conductor; usual arrangement of wrought iron handrail to form a continuous conductor from lantern to base of tower.
13. 46 feet.
14. 121 feet.
15. 12 $\frac{1}{2}$ miles.
16. 17 miles.
17. 220° N. to S.W. $\frac{1}{2}$ S.
18. Fixed; light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the light; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company (Boulton and Watt).
25. Through dome of lantern; there are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None.
27. None.
28. 22 days.
29. 9,213*l.*, including cost of lantern light, apparatus, &c.
30. Finished.
31. 950*l.* (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 3*l.* 0*s.* 10*d.*
34. Coated with paint once every year, 33*l.* 17*s.* 1*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
36. 675*l.*; 100*l.* Total, 775*l.*
37. 1857, cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 4*s.* 4*d.* 1858, repairs, 15*l.* 7*s.* 8*d.*; cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 4*s.* 4*d.*
38. 1857, oil, 652 gallons; wicks, 11 gross. 1858, oil, 662 gallons; wicks, 11 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2 $\frac{1}{2}$ *d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross, 1*l.* 18*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross, 1*l.* 18*s.* 6*d.* total cost.
41. None.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 877*l.* 14*s.* 11*d.* 1858, quarter, 765*l.* Total for 1852, 3,510*l.* 19*s.* 6*d.*
44. 1852, 429*l.* 19*s.* 14*d.*, including cost of carriage of oil and other stores. 1858, 344*l.* 9*s.* 4*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation or complaint.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store, close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made for use of tide signals.
56. Signal mast and flag; no night signals used.
57. Keeper on watch relieved in lightroom at 12 o'clock, midnight. Keepers are changed from the station as removals from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

133.

WICKLOW, UPPER.

East Coast of Ireland, on the Point of Wicklow Head.

Lat. 52° 57' 50" N., Lon. 6° 0' 5" W.

3. No local authority.
4. One light; distant from the Wicklow Lower Light 180 yards, bearing N.W. by W. $\frac{3}{4}$ W.
5. Not ascertained; two old lighthouses, of which one tower is still left standing as a sea mark, were transferred from the Revenue Board in 1810. The Port of Dublin Corporation adopted the present positions, farther out on Wicklow Head.
6. Not ascertained.
7. A coast light being requisite there, next southward of the Dublin Bay Lights, and as a fitting position for leading lights to guide through the Wicklow swash to the channel between the banks.
8. 1818, first exhibition of present lights.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation. Built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone tower; circular; built with solid walling; painted white externally. The two lights (upper and lower) mark the position by day.
12. No separate external conductor; usual arrangement of wrought iron handrail to form a continuous conductor from lantern to base of tower.
13. 75 feet.
14. 250 feet.
15. 18 miles.
16. 22 miles.
17. 22° N. to S.W. $\frac{1}{2}$ S.
18. Fixed; light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the light; burners adapted for use of raperseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern; there are also ventilators in blocking and floor of lightroom to regulate supply of air.
26. None.
27. None.
28. 22 days.
29. 9,21*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. 950*l.* (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 3*l.* 0*s.* 10*d.*
34. Coated with paint once every year, 3*l.* 17*s.* 1*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
36. 675*l.*; 100*l.* Total, 775*l.*
37. 1857, cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 4*s.* 4*d.* 1858, repairs, 8*l.* 11*s.* 6*d.*; cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 4*s.* 4*d.*
38. 1857, oil, 651 gallons; wicks, 11 gross. 1858, oil, 665 gallons; wicks, 11 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross, 1*l.* 18*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross, 1*l.* 18*s.* 6*d.* total cost.
41. None.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 877*l.* 14*s.* 11*d.* 1858, quarter, 765*l.* Total for 1852, 3,510*l.* 19*s.* 6*d.*
44. 1852, 429*l.* 19*s.* 1*d.*, including cost of freight of oil and other stores. 1853, 344*l.* 9*s.* 4*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation or complaint.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made for use of tide signals.
56. Signal mast and flag; no night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as removals from other lighthouses require and allow.

134.

TUSKAR ROCK.

East Coast of Ireland, off East Coast of County of Wexford.

Lat. 52° 12' 9" N., Lon. 6° 12' 21" W.

3. None. Lightkeeper holding constant communication with Ballast Office, Dublin, transacts the business of the station.
4. One light.
5. 1811.
6. Chamber of Commerce, Waterford.
7. As the best position for a general sea light on that south-eastern angle of the coast, and in order to mark the Tuskar Rock, and other dangers in the vicinity.
8. 1815.
9. Designed by (the late) George Halpin, Engineer to Port of Dublin Corporation, built under his direction by the workmen of the Corporation, and not by contract.
10. Sea light.
11. Cut stone tower, solid walls, coloured white outside, identified by its appearance as a lofty circular tower with projecting gallery below lantern, and standing on a low rock $\frac{1}{2}$ miles distant from the mainland.
12. No separate external lightning conductor.
13. 110 feet.
14. 101 feet.
15. 11 $\frac{1}{2}$ miles.
16. 15 miles.
17. 360°. Lighted all around the circle.
18. Revolving. Two sides of light of natural colour, white, and one red.
19. Light flashes every second minute, appearing of red colour every sixth minute. Flash lasts nearly ten seconds, gradually increasing and declining in strength.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. Burners suited to use of raperseed oil.
24. Parabolic reflectors by the Soho Plate Company.
25. Ventilation through dome. Ventilation also in blocking to floors of lightroom to regulate supply of air.
26. Bells tolled by machinery.
27. 14 days.
28. 14 days.
29. 35,877*l.*, including all expenses to year 1818.
30. Lighthouse finished. It is intended to have an addition built on the dwelling annexed to the tower outside.
31. Lantern sash 13 feet in diameter, 8 feet high. 1,097*l.* (approximate.)
32. Was not purchased, was built by the Port of Dublin Corporation.
33. 4*l.* 16*s.* 1*d.*
34. General coating of paint once in each year. 61*l.* 1*s.* 5*d.* Paints procured by contract. Workmanship not by contract.
35. Two keepers; one at 64*l.* 12*s.* 4*d.*, one at 46*l.* 3*s.*
36. 1,999*l.* (approximate.)
37. 1857, repairs, 19*l.* 2*s.*; cylinders, 7*l.* 8*s.*; cleaning stores, 2*l.* 5*s.* 4*d.* 1858, cylinders, 7*l.* 8*s.*; cleaning stores, 2*l.* 5*s.* 4*d.*
38. 1857, oil, 729 gallons; wicks, 12 gross. 1858, oil, 744 gallons; wicks, 12 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; total cost, 2*l.* 2*s.* 1858, 3*s.* 6*d.* per gross; total cost, 2*l.* 2*s.*
41. 450*l.* (probable.)
42. Light maintained from Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. 1852, 872*l.* 14*s.* 5*d.* 1858, 765*l.* 7*s.* 7*d.* Total for 1852, 3,490*l.* 17*s.* 7*d.*
44. 1852, 1,052*l.* 0*s.* 2*d.*, including attendance of decked cutter and freight of stores. 1858, 671*l.* 18*s.* 3*d.* ditto.
45. None.
46. None.
47. None.
48. No representation as to the light being either unnecessary or placed in an unsuitable position, but on the contrary, it has been frequently referred to as of great importance and use, from its position.
49. None; the light has often been mentioned in published statements as being very efficient.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857 and 1858.
52. Not known to have been extinguished on any occasion since first lighted.
53. At least one spare lamp and two spare burners kept in readiness. Oil stored in oil store in the lighthouse.
54. Barometer and thermometer.
55. No tide signals; from the distance of the rock from the shore not requisite. No application made from any quarter for the exhibition of tide signals at the station.
56. Signal mast and flag.
57. Keeper on watch relieved in lightroom at 12 o'clock midnight. Keepers are changed from the station as changes from the other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

135.

HOOK TOWER.

South Coast of Ireland, on outer End of Hook Point, East Side of Entrance to Waterford Harbour.

Lat. $52^{\circ} 7' 25''$ N., Lon. $6^{\circ} 55' 53''$ W.

3. No local authority.
4. One light.
5. Not ascertained.
6. Not ascertained.
7. Position of old beacon tower adopted and continued. Useful and requisite as a sea light before the erection of the Tnskar and Minehead sea lights, and before the placing of the Saltees or Coningbeg (floating) lights, serving also to guide from seaward to Waterford Harbour, and to light the channel from the Hook Point to the bar.
8. 1791 (as a lighthouse light).
9. Name of builder and engineer of the Old Hook Tower not ascertained. Lantern erected by Port of Dublin Corporation.
10. Sea light.
11. Massive stonework, chiefly rubble in courses. The floors on arches of masonry. Tower is circular, coloured white, with three broad red belts.
12. No separate external conductor.
13. 115 feet.
14. 152 feet.
15. 15 miles.
16. 18 miles.
17. 294° N.N.E. $\frac{1}{2}$ E. to E.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Co.
25. Through dome of lantern. There are also ventilators in the blocking of lightroom to regulate supply of air.
26. Two fog bells struck by machinery.
27. 21 days.
28. 21 days.
29. Improvements, 4,300*l.*, such as lantern, apparatus, &c.
30. Finished.
31. Lantern sash, 11 feet diameter, 6 feet high. 750*l.* total cost.
32. Not purchased, transferred by the Revenue Board to the Port of Dublin Corporation.
33. 3*l.* 15*s.*
34. Coated with paint once every year, 39*l.* 7*s.* 8*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
36. 945*l.* total cost (approximate).
37. 1857, cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 3*s.* 4*d.* 1858, repairs, 23*l.* 13*s.* 8*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 3*s.* 4*d.*
38. 1857, oil, 811 gallons; wicks, 13 gross. 1858, oil, 826 gallons; wicks, 13 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 5*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 5*s.* 6*d.* total cost.
41. Two fog bells, 300*l.*; machine, 150*l.*; erection, &c., 75*l.* Total cost, 525*l.*
42. From Mercantile Marine Fund. Revenue collected and paid as per Special Return No. 1.
43. 1852, quarter, 821*l.* 4*s.* 6*d.* 1858, quarter, 741*l.* 1*s.* 1*d.* Total for 1852, 3,284*l.* 18*s.*
44. 1852, 886*l.* 4*s.* 4*d.*, including cost of freight of stores from Dublin. 1858, 519*l.* 17*s.* 11*d.*, ditto.
45. None.
46. None.
47. None.
48. No complaints or representation as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag. No night signals used. It is proposed to adopt a code of signals at some of the principal stations.
57. Keeper on watch relieved in the lighthouse at 12 o'clock, midnight. Keepers are changed from the station as changes from other lighthouses require and allow.

136.

DUNCANNON FORT.

South-east Coast of Ireland, East Side of Waterford Harbour.

Lat. $52^{\circ} 13' 13''$ N., Lon. $6^{\circ} 56' 7''$ W.

3. No local authority.
4. Two lights in same tower, 10 feet vertically apart. Fort lighthouse distant from Duncannon north lighthouse half a mile, bearing S.S.W. $\frac{3}{4}$ W. The fort light and north light serve as leading lights to guide over the bar.
5. Not ascertained, having been transferred from the Revenue Board.
6. Not ascertained.
7. To light east side of Waterford harbour within the bar, and to serve for guidance over the bar.
8. 1803.
9. Not ascertained, transferred by the Revenue Board to the Port of Dublin Corporation in 1810.
10. Harbour light.
11. Chiefly rubble masonry, solid wall.
12. No lightning conductor.
13. 25 feet.
14. 53 feet.
15. 8½ miles.
16. 11 miles.
17. 119° S.S.W. to S.W. by S. to seaward.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. No fog signals used; none applied for.
27. None.
28. 10 days.
29. Improvements, 700*l.*
30. Finished.
31. 150*l.*, estimated cost.
32. Not purchased, transferred from Revenue Board.
33. 1*l.* 13*s.* 5*d.*
34. Coated with paint once every year, 7*l.* 10*s.* Paints procured by contract; workmanship not by contract.
35. One keeper at 2*l.*, exceptional rate.
36. 175*l.*, estimated cost.
37. 1857, repairs, 2*l.* 8*s.* 10*d.*; cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 3*s.* 8*d.* 1858, cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 3*s.* 8*d.*
38. 1857, oil, 170 gallons; wicks, 4 gross. 1858, oil, 170 gallons; wicks, 4 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross, 14*s.* total cost, 1858, 3*s.* 6*d.* per gross, 14*s.* total cost.
41. None.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 119*l.* 13*s.* 8*d.* 1858, quarter, 30*l.* 0*s.* 5*d.* Total for 1852, 478*l.* 14*s.* 6*d.*
44. 1857, 168*l.* 16*s.* 8*d.* (including cost of freight of stores from Dublin.) 1858, 76*l.* 3*s.* 1*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in lighthouse building.
54. None in 1858.
55. No night signals used; none applied for.
56. No night signals used; none found requisite.
57. One keeper.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

137.

DUNCANNON, NORTH.

South-east Coast of Ireland, East Side of
Waterford Harbour.

Lat. 52° 13' 13" N., Lon. 6° 56' W.

3. No local authority.
4. One light distant from the Duncannon Fort light half a mile, bearing N.N.E. $\frac{3}{4}$ E.
5. 1882.
6. Waterford Harbour Commissioners.
7. To form with the Duncannon Fort Lighthouse leading lights to guide over Duncannon Bar.
8. 1838.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation. The tower and dwellings built by contract by Mr. Legge, of Duncannon.
10. Harbour light.
11. Cut stone tower; stone walling; tower circular, coloured white externally.
12. No separate external conductor. Usual arrangement of wrought-iron handrail.
13. 35 feet.
14. 128 feet.
15. 13 miles.
16. 17 miles.
17. 2° S.W. $\frac{1}{2}$ S. to S. S. W. $\frac{1}{2}$ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Parabolic reflectors from Soho Plate Co. Wrought-iron frame by workmen of the Corporation.
25. Usual arrangement of other catoptric lights through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used; none applied for.
27. None.
28. 10 days.
29. 4,945*l.* 12*s.* 10*d.*, including cost of lantern, lighting apparatus, &c., with cost of arched platform, embankment, roadways, &c.
30. Finished.
31. Lantern sash, 7 feet 6 inches diameter, 4 feet high; *l.*
32. Not purchased; erected by Corporation.
33. No repairs of buildings requisite during five years ending 1858.
34. Coated with paint once every year, 15*l.* 19*s.* 6*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 46*l.* 3*s.*
36. 210*l.*
37. 1857, repairs, 2*l.* 16*s.* 8*d.*; cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 3*s.* 8*d.* 1858, cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 3*s.* 8*d.*
38. 1857, oil, 170 gallons; wicks, 4 gross. 1858, oil, 170 gallons; wicks, 4 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross; 14*s.* total cost. 1858, 3*s.* 6*d.* per gross; 14*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 119*l.* 13*s.* 8*d.* 1858, quarter, 30*l.* 1*s.* 5*d.* Total for 1852, 478*l.* 14*s.* 6*d.*
44. 1852, 203*l.* 6*s.*, including cost of freight of stores from Dublin. 1858, 123*l.* 13*s.* 10*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. None in 1858.
55. No tide signals used; none applied for.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

138.

DUNMORE.

South-east Coast of Ireland, on Dunmore
Pierhead, West Side of Waterford Har-
bour.

Lat. 52° 9' N., Lon. 6° 59' 50" W.

3. No local authority.
4. One light.
5. Proposed in plan for Dunmore pier and harbour, constructed for accommodation of the mail steam packet post office service.
6. Determined on by Government.
7. Light necessary on the pierhead to guide vessels to and from the harbour.
8. 1826.
9. Designed by the late Alexander Nimmo, C.E., the engineer of the harbour, under whose direction the tower was built.
10. Harbour light.
11. Solid cut stone tower or column on pierhead.
12. No separate external conductor.
13. 51 feet.
14. 44 feet.
15. 7½ miles.
16. — miles (red light not visible to distance of sea horizon, unless in very clear weather).
17. 84° S. by E. $\frac{1}{2}$ E. to E. by N.
18. Fixed. Light coloured red to seaward; shown of natural appearance, white, to harbour.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from Soho Plate Company (Boulton and Watt).
25. Through dome of lantern.
26. None used; none applied for.
27. None.
28. 16 days.
29. Improvements, 500*l.*
30. Finished.
31. Not ascertained, transferred by Government.
32. Not purchased, transferred by Government.
33. 22*l.* 13*s.* 1*d.* (including cost of special repairs of base and floor of pier, not of lighthouse tower).
34. Coated with paint once every year, 15*l.* 13*s.* 8*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 210*l.* total.
37. 1857, repairs, 2*l.* 5*s.* 8*d.*; cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 149 gallons; wicks, 3 gross. 1858, oil, 161 gallons; wicks, 8 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross, 10*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross, 10*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund.
43. No light dues charged.
44. 1852, 178*l.* 17*s.* 6*d.* (including freight of oil and stores from Dublin.) 1858, 156*l.* 11*s.* 10*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation or complaint.
49. None.
50. By Committee of Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining the lighthouse.
54. None in 1858.
55. None used or applied for.
56. Signal mast and flag. No night signals used; none found requisite.
57. One keeper. Relieved from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

139.

DUNGARVAN.

South Coast of Ireland, Ballinacourty Point, County of Waterford.

Lat. 52° 4' 27" N., Lon. 7° 39' 5" W.

3. No local authority.
4. One light.
5. 1848.
6. Merchants of Dungarvan.
7. Best general position to guide past outer rocks, and to serve as inner harbour light.
8. 1858.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. Erected by the workmen of the Corporation, and not by contract.
10. Harbour light.
11. Circular stone tower of limestone, solid walls.
12. No outer lightning conductor. Usual arrangement of capping of iron handrail, forming continuous conductor from lantern dome to bottom of tower.
13. 44 feet.
14. 52 feet.
15. 8½ miles.
16. 10 miles.
17. (239°.) L. to N.W. ¼ N.
18. Fixed. Light is coloured red in direction of Carrickapane Rock, green in direction of rocks off Ballinacourty Point, and of natural appearance, white in all other directions in which it is visible.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 3rd order.
23. No alteration since lighted. None suggested, the light serving well the designed purpose.
24. Mr. Wilkins, of London.
25. Ventilating tube continued through centre of dome.
26. None.
27. None.
28. None.
29. 6,737l. 6s., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 10 feet diameter, 6 feet high; 566l. (including cut stone blocking.)
32. Not purchased, built by the Port of Dublin Corporation.
33. Not lighted until 1858.
34. Coated with paint once in each year. 96l. 10s. in 1858. Paints procured by contract. Workmanship not by contract.
35. One keeper at 46l. 3s.
36. 366l. 5s., 107l. 14s. 10d.; total, 473l. 19s. 10d.
37. Not lighted until 1858.
38. Not lighted ditto.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. 1858, cotton concentric wick. Not lighted until 1858.
41. None.
42. From Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. Not lighted until 1858, quarter, 1l. 0s. 2d.
44. Not lighted ditto.
45. None.
46. None.
47. None.
48. No complaints or representation made.
49. No complaint or representation made as to efficiency of the light.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. Station inspected on circuit in 1857, by superintendent in 1858.
52. Not known to have been extinguished during night since first established.
53. At least two spare burners always kept ready. Oil stored in oil store adjoining dwelling and close to lighthouse.
54. None in 1858.
55. No tide signals used. There has not been any application or requisition to have tide signals used at the station.
56. Signal mast and flag. No night signals.
57. One keeper. Keepers are changed from the station as required by changes at other lighthouses.

140.

MINEHEAD.

South Coast of Ireland, County of Waterford.

Lat. 51° 59' 33" N., Lon. 7° 35' 8" W.

3. The Port of Dublin Corporation have not any formally appointed local agents paid, as such correspondence is held directly with the lightkeepers.
4. One light only.
5. 1848.
6. Cork Harbour Commissioners, position previously suggested by Inspector of Lighthouses.
7. Previously to the erection of Minehead and Ballycotton lights, the coast between Cork light and the Hook Tower light was without lights; these were selected as the most judicious points for intervening coast lights. Minehead also marks approach to Dungarvan Bay.
8. 1st June 1851.
9. Walling of tower and dwelling built by contract, from the design and under the direction of Mr. Halpin, Engineer to the Port of Dublin Corporation. Contractor, Mr. W. Raleigh.
10. Sea light.
11. Tower, solid masonry without a separate inner wall, coated inside with cement. Tower, light grey stone colour.
12. General arrangement of connexion of metal inclosure plate of lightroom with the handrail of tower.
13. 68 feet.
14. 285 feet.
15. 19 miles.
16. 23 miles.
17. 209° N.E. by E. ¼ E. to W. ¼ S.
18. Intermittent.
19. Light visible during 50 seconds, and eclipsed during 10 seconds. The arrangement to produce eclipses of this light designed by the Engineer of the Port of Dublin Corporation.
20. During whole night, from sunset to sunrise.
21. Dioptric, fitted with catadioptric zones above and below the main refracting bell.
22. 1st order, one concentric wick lamp lighted.
23. No alteration in description or character of illuminating apparatus since first lighted.
24. Wilkins, of London, maker of the dioptric apparatus; McMaster, of Dublin, made the machine.
25. Central tube through dome of lantern.
26. No fog signals, none having been considered necessary in this position.
27. None.
28. 28 days.
29. 9,790l. 19s. 7d., including cost of lantern, light apparatus, &c.
30. All buildings essentially requisite are completed.
31. Lantern sash 13 feet diameter, 10 feet high, 825l. (including stone blocking.)
32. Lighthouse was not purchased; was built by Port of Dublin Corporation.
33. 2l. 1s. 8d.
34. General coating of paint once in each year, 34l. 5s. Paints procured by contract. Workmanship not by contract.
35. One keeper at 64l. 12s. 4d. per annum. One ditto at 46l. 3s. per annum.
36. 1,574l. 17s. 4d.; 144l. 10s. 3d.; 129l.—Total, 1,847l. 7s. 7d.
37. 1857, repairs, 32l. 13s. 8d.; cylinders, 4l. 4s.; cleaning stores, 7l. 8s. 4d. 1858, repairs, 32l. 12s. 11d.; cylinders, 4l. 4s.; cleaning stores, 2l. 7s. 4d.
38. 1857, oil, 474 gallons; wicks, 33 gross. 1858, oil, 487 gallons; wicks, 33 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon; 1858, 3s. 5d. ditto.
40. Cotton concentric wick. 1857, 2l. 5s. total cost. 1858, 2l. 5s. total cost.
41. No fog signal apparatus.
42. Light is maintained from the Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. 1858, quarter, 742l. 3s. 7d.; 1858, quarter, 636l. 13s. 11d. Total for 1852-2,908l. 14s. 6d.
44. 1858, 392l. 4s. 2d. (including freight of stores). 1858, 395l. 13s. 9d. ditto.
45. None.
46. None.
47. None.
48. No complaints made as to the light being unnecessary or placed in an unsuitable position since lighted.
49. No complaints or representation as to the efficiency of light since lighted.
50. Committee of Board and by Superintendent of Lighthouses.
51. On circuit of inspection in 1857. Ditto, 1858.
52. Not known to have been extinguished during night since lighted.
53. At least two lamp burners are kept ready. Oil kept in oil store adjoining principal keeper's dwelling, there being some positive advantages in having it kept there.
54. Barometer and thermometer.
55. Tide signals not used at this station, not considered necessary.
56. Mast and flag.
57. Relieved from watch in lightroom at 12 o'clock at midnight changed from station according as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

141.

YOUGHAL.

South-east Coast of Ireland, West Side of Entrance to Youghal Harbour, County Cork.

Lat. 51° 56' 34" N., Lon. 7° 50' 34" W

3. No local authority.
4. Only one light.
5. March 1848.
6. Suggested by Port of Dublin Corporation.
7. As the most eligible position for a harbour light.
8. February 1852.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation, and built under his supervision by workmen of the Corporation.
10. Harbour light.
11. Cut stone; solid wall; circular tower, with projecting gallery.
12. No external conductor. Usual arrangement of iron handrail to form continuous conductor from lantern to base of tower.
13. 43 feet.
14. 78 feet.
15. 10 miles.
16. 12 miles.
17. N. $\frac{1}{2}$ E. to S.W. by S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 3rd order.
23. No alteration in illuminating apparatus since 1845.
24. Wilkins, of London.
25. Ventilating tube through centre of dome, also ventilators through blocking and floor of lantern to regulate supply of air.
26. No fog signals at this station; none applied for.
27. None.
28. 12 days.
29. 4,679*l.* 6*s.* 5*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, diameter, 6 feet high. Total, 467*l.* (including cut stone blocking).
32. Not purchased; erected by Port of Dublin Corporation.
33. 1*l.* 12*s.* 2*d.*
34. Coated once each year, 22*l.* 4*s.* 10*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 46*l.* 3*s.*
36. 398*l.* 6*s.* 8*d.*; 10*l.* Total, 502*l.*
37. 1857, cylinders, 3*l.* 10*s.*; cleaning stores, 1*l.* 3*s.* 8*d.* 1858, repairs, 1*l.* 16*s.* 6*d.*; cylinders, 3*l.* 10*s.*; cleaning stores, 1*l.* 3*s.* 8*d.*
38. 1857, oil, 318 gallons. 1858, oil, 305 gallons.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, 1*l.* 17*s.* 6*d.* total cost. 1858, 1*l.* 17*s.* 6*d.* total cost.
41. No fog signal apparatus at this station.
42. From Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 21*l.* 2*s.* 8*d.* 1858, quarter, 4*l.* 3*s.* 10*d.* Total for 1852, 84*l.* 10*s.* 10*d.*
44. 1852, nil. 1858, 17*l.* 11*s.* 6*d.* (including cost of freight of stores, &c.)
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. At least two spare burners kept in readiness.
54. None in 1858.
55. No tide signals used at this station; none applied for.
56. No night signals used. Signal mast and flag.
57. One keeper. Keeper changed from the stations as required by changes at other stations.

142.

BALLYCOTTIN ISLAND.

South Coast of Ireland, summit of Ballycotton Island, County of Cork.

Lat. 51° 49' 30" N., Lon. 7° 59' W.

3. The Port of Dublin Corporation have not any formally appointed local agents paid as such.
4. One light only.
5. 1848.
6. Cork Harbour Commissioners.
7. Its general position on the coast, as serving with the light on Alinehead to light a range of coast.
8. 1st June 1851.
9. Tower and dwellings built by contract from the plans and specification, and under the superintendence of Mr. Halpin, Engineer to Port of Dublin Corporation. Contractors, Messrs. Brash, of Cork.
10. Sea light.
11. Solid masonry, of stone of the vicinity, coated inside with cement plaster.
12. Iron handrail of tower connected with metal inclosure plate of lightroom.
13. 50 feet.
14. 195 feet.
15. 16 sea miles.
16. 20 sea miles.
17. 191° E. $\frac{1}{2}$ N. to W. $\frac{1}{2}$ N.
18. Flashing.
19. Flash once in every 10 seconds.
20. From sunset to sunrise (every night.)
21. Dioptric vertical reflectors are moved in front of the upper and lower catadioptric zones simultaneously with the polygonal lenses; from this arrangement a powerful flash is produced.
22. 1st order, one concentric wick burner.
23. No alteration in character of illuminating apparatus.
24. Wilkins, of London.
25. Tube through dome of lantern.
26. Large fog bell rung by machinery.
27. 55 days.
28. 55 days.
29. 11,746*l.* 15*s.* 5*d.*, including cost of lantern, light apparatus, inclosure approach, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 10 feet high, 839*l.* (including stone blocking.)
32. Not purchased, but built by Port of Dublin Corporation.
33. 4*l.* 10*s.* 10*d.*
34. Paint coated once in each year, 52*l.* 13*s.* 4*d.* Paints procured by contract. Workmanship not by contract.
35. Two keepers, one at 64*l.* 12*s.* 4*d.*, one at 46*l.* 3*s.*; watchman attending bell, 36*l.* 10*s.*
36. 2,838*l.* 12*s.* 7*d.*; 259*l.* 13*s.* 3*d.*
37. 1857, cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 7*s.* 4*d.* 1858, repairs, 4*l.* 1*s.* 4*d.*; cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 7*s.* 4*d.*
38. 1857, oil, 316 gallons; wicks, 94 gross. 1858, oil, 354 gallons; wicks, 34 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon; 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wicks. 1857, 2*l.* 5*s.* total cost. 1858, 2*l.* 5*s.* total cost.
41. Bell, 229*l.*; machine, 170*l.*; bellry, 357*l.* Total, 756*l.*
42. From Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 710*l.* 4*s.* 1*d.*; 1858, quarter, 646*l.* 1*s.* Total for 1852, 2,840*l.* 16*s.* 4*d.*
44. 1852, nil. 1858, 436*l.* 5*s.* 9*d.* (including boat attendance and freight of stores.)
45. None.
46. None.
47. None.
48. No complaint or representation as to the light being unnecessary or placed in an unsuitable position.
49. No complaint or representation received as to the efficiency of the light.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto in 1858.
52. Light not extinguished, but representation having been made that it did not resolve on the morning of 5th Nov. 1857, and examination made and facts sworn to, the principal keeper was dismissed from the lighthouse service.
53. At least two spare burners kept in readiness. Oil stored in oil store adjoining principal keeper's dwelling and close to the lighthouse.
54. Barometer and thermometer.
55. Tide signals not used, this lighthouse not being in vicinity of or at entrance of any navigation dependent on the state of the tide.
56. Exhibition of flag by day requires the attendance of boat, but from closeness of island to the shore, and from frequency of boat attendance, it is seldom requisite to hoist flag.
57. The keepers remain at this station until transferred to another, their families residing on the island; changes become necessary chiefly in order that keepers at remote island stations may not be continued there too long.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

143.

CORK.

South Coast of Ireland, on Roches Point, East Side of Entrance of Cork Harbour.

Lat. 51° 47' 33" N., Lon. 8° 15' 14" W.

3. No local authority.
4. One light.
5. 1815.
6. Merchants of Cork.
7. To serve as a sea light (previously to erection of the Ballycotton light), to guide from seaward to Cork Harbour and light its entrance.
8. 1817.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation. Built under his direction by the workmen of the Corporation; not by contract.
10. Sea light.
11. Cut stone; solid walling. The tower is of circular form, coloured white, and having the residence extending from it laterally.
12. No external lightning conductor. Wrought iron handrail forms continuous conductor from lantern to base of tower.
13. 49 feet.
14. 92 feet.
15. 11 miles.
16. — miles. Red light not seen to sea horizon, unless in very clear weather.
17. 237° N. by E. to S.E.
18. Fixed. Light is coloured red to seaward, and is of the natural appearance, white, towards the harbour.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil. Ruby cylinders substituted for red discs, at suggestion of the engineer of the Corporation.
24. Reflectors from the Soho Plate Company.
25. Same as in the other catoptric lights, through dome of lantern. There are also ventilators in the blocking and floor of light-room to regulate the supply of air. Improvement of the apparatus is under consideration.
26. None.
27. None.
28. 19 days.
29. 6,000*l.* (present lighthouse), including cost of lantern, light apparatus, &c.
30. Finished.
31. 1,030*l.* (including cut stone blocking).
32. Not purchased; erected by Corporation.
33. 10*l.* 2*s.* 9*d.*
34. Coated with paint once every year, 15*l.* 18*s.* 1*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 6*l.* 12*s.* 4*d.*
36. 76*5*l.**; 75*l.* Total, 840*l.*
37. 1857, repairs, 20*l.* 5*s.* 5*d.*; cylinders, 5*l.* 8*s.*; cleaning stores, 1*l.* 13*s.* 6*d.* 1858, repairs, nil. (nor in 1855 or 1856); cylinders, 5*l.* 8*s.*; cleaning stores, 1*l.* 13*s.* 6*d.*
38. 1857, oil, 732 gallons; wicks, 11 gross. 1858, oil, 726 gallons; wicks, 11 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 1*l.* 18*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 18*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 689*l.* 4*s.* 2*d.* 1858, quarter, 671*l.* 5*s.* 9*d.* Total for 1852, 2,756*l.* 16*s.* 10*d.*
44. 1852, 211*l.* 15*s.* 9*d.* (including boat attendance, freight of stores, &c.) 1858, 267*l.* 18*s.* 8*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation or complaint as to the position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burners kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag.
57. One keeper. Keeper removed from the station when changes from other lighthouses render it necessary.

144.

SPIT BANK.

Cork Harbour, off North-east Point of the Spit Bank.

Lat. 51° 50' 41" N., Lon. 8° 16' 26" W.

3. No separate agent or local authority, the lightkeeper transacting all the business of the station under instruction.
4. One light.
5. 1848.
6. Cork Harbour Commissioners.
7. As marking north-east projecting point of the Spit bank and angle or bend in the channel, where sailing course to Queenstown is altered.
8. 1853.
9. Engineer, George Halpin, Engineer to the Port of Dublin Corporation. The screw piles and keeper's dwelling were built under contract by Mr. Mitchell, patentee of the screw piles; the lantern was erected by workmen of the Corporation.
10. Harbour light.
11. Octagonal sheet iron house, borne on 9 wrought piles, coloured red, at once recognized by the peculiar open appearance of the screw piles, which are placed apart in the angles and centre of octagon.
12. The whole building forms a large continuous conductor; the lantern metal; the dwelling of sheet iron, bearing on wrought iron piles set in the water, the depth at low water being over two fathoms.
13. 75 feet. 75 feet from base screws to vane height; from surface of sand to vane varies as the sands shift.
14. 32 feet.
15. 6 miles.
16. 8 miles.
17. 270° S.S.W. ½ W. to N.W. by W. ½ W.
18. Fixed red light.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 4th order.
23. Light strengthened in 1860 at suggestion of Cork Harbour Commissioners; character of light the same.
24. Chance, of Birmingham.
25. Ventilating tube through centre of dome.
26. None.
27. None.
28. Register not satisfactory.
29. 6,412*l.* 9*s.* 3*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. 136*l.* 9*s.* 10*d.*
32. Was not purchased, but built by the Port of Dublin Corporation.
33. None.
34. General coating of paint once a year, 41*l.* 13*s.* Paints procured by contract; workmanship not by contract.
35. One keeper, 6*l.* 12*s.* 4*d.*; one helper, 30*l.* 10*s.*
36. 135*l.*; 25*l.* Total, 160*l.*
37. 1857, cylinders, 18*s.*; cleaning stores, 19*s.* 8*d.* 1858, repairs, 2*l.* 7*s.*; cylinders, 18*s.*; cleaning stores, 19*s.* 8*d.*
38. 1857, oil, 60 gallons; wicks, 2 gross. 1858, oil, 60 gallons; wicks, 2 gross. Larger apparatus fitted up in 1860 will cause increased consumption of oil and wicks.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, 8*s.* total cost. 1858, 8*s.* total cost.
41. No fog signal apparatus.
42. Light maintained from the Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. Not lighted in 1852. For quarter 1858, 65*l.* 2*s.* 2*d.*
44. 1852, nil. 1858, 205*l.* 16*s.* 11*d.* (including cost of boat attendance, freight of stores, &c.)
45. None.
46. None.
47. None.
48. There have not been any complaints that the light is unnecessary or placed in an unsuitable position.
49. The Cork Harbour Commissioners having suggested that the strength of the light should be increased, the Port of Dublin Corporation having obtained the sanction of the Board of Trade, had a higher order of apparatus placed.
50. By Committee of the Port of Dublin Corporation and by Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. The light has not been known to have been extinguished since first established.
53. There is a spare lamp and two spare burners kept in readiness. The oil stored in a room under the lightroom.
54. None in 1858.
55. No tide signals are used; Cork Harbour being a deep water harbour navigable at low water by large ships beyond the range of this light, there has not been any requisition to have tide signals shown.
56. From proximity to shore and to Queenstown no formal code of signals used.
57. Keeper on watch relieved in lightroom at 12 o'clock midnight.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

145.

CHARLES FORT.

South Coast of Ireland, in Charles Fort,
Kinsale Harbour.

Lat. 51° 41' 48" N., Lon. 8° 29' 50" W.

3. No local authority.
4. One light.
5. Not ascertained.
6. Not ascertained.
7. To light Kinsale Harbour channel.
8. 1804.
9. The engineer and builder of the fort. The light was transferred to the Port of Dublin Corporation by the Revenue Board in 1810.
10. Harbour light.
11. Hammered masonry and brick work. Rooms in the barrack facing harbour appropriated for lightroom and for keeper.
12. No lightning conductor.
13. 48 feet.
14. 98 feet.
15. 1½ miles.
16. 14 miles.
17. 12° S.S.W. ¼ W. to S.W. ¼ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus; burners adapting for use of rapeseed oil.
24. Reflectors from the Soho Plate Co.
25. Through covering over lantern sash.
26. None used; none applied for.
27. None.
28. None.
29. Improvements, 500*l*.
30. Finished.
31. 75*l*., estimated cost.
32. Not purchased, transferred from Revenue Board.
33. 7*s*. 6*d*.
34. Coated with paint once in every year. 4*l*. 3*s*. Paints procured by contract; workmanship not by contract.
35. One keeper at 21*l*., exceptional rate.
36. 170*l*. estimated cost.
37. 1857, cylinders, 1*l*. 16*s*.; cleaning stores, 1*s*. 10*d*. 1858, repairs, 7*l*. 11*s*. 8*d*.; cylinders, 1*l*. 16*s*.; cleaning stores, 1*s*. 10*d*.
38. 1857, oil, 150 gallons; wicks, 4 gross. 1858, oil, 146 gallons; wicks, 4 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross; 14*s*. total cost. 1858, 3*s*. 6*d*. per gross; 14*s*. total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 29*l*. 1*s*. 4*d*. 1858, quarter, 8*s*. 10*d*. Total for 1852, 11*l*. 5*s*. 6*d*.
44. 1852, 190*l*. 5*s*. 3*d*., including cost of freight of stores from Dublin. 1858, 83*l*. 1*s*. 8*d*., ditto.
45. None.
46. None.
47. None.
48. No representation or complaint.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil store adjoining lightroom.
54. None in 1858.
55. No tide signals used or applied for.
56. No night signals used; none found requisite.
57. One keeper.

146.

KINSALE.

South Coast of Ireland, on South Point of
Old Head.

Lat. 51° 36' 11" N., Lon. 8° 31' 58" W.

3. No local authority.
4. One light.
5. See No. 6 (following No.)
6. Old light transferred from the Revenue Board in 1810.
7. As being the best position for a sea light on that part of the coast between the Fastnet Rock and Co'k Harbour; it is on the outer point of a very prominent headland, and serves also to guide to the entrance of Kinsale Harbour.
8. 1853, date of first exhibition of present light on South Point. Old light farther inland (now discontinued) was established in 1855.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. Buildings were erected by the workmen of the Corporation, and not by contract.
10. Sea light.
11. Stone tower, solid wall, coated with cement. Painted white with two red belts.
12. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to base of tower. No separate external conductor.
13. 10½ feet.
14. 236 feet.
15. 18 miles.
16. 22 miles.
17. 20° N.E. ¼ N. to N.W. by N.
18. Fixed, white to seaward; red in direction of the Horse Rock in Courtmaesherry Bay.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 1st order.
23. Light extended into Courtmaesherry Bay, by direction of the Board of Trade, in 1855.
24. Wilkins of London.
25. Ventilating tube through centre of dome; there are minor ventilators through floor and through blocking of lightroom, to regulate supply of air.
26. No fog signals at this station.
27. None.
28. None. (Register not satisfactory.)
29. 10.594*l*., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 10 feet high; 744*l*. (including stone blocking.)
32. Present lighthouse was erected by the Port of Dublin Corporation, and was not purchased.
33. 1*l*. 16*s*. 2*d*.
34. Coated with paint once in each year. Average, 45*l*. 11*s*. 6*d*., reduced to 34*l*. Paints procured by contract. Workmanship not by contract.
35. Two keepers' one at 64*l*. 12*s*. 4*d*., one at 46*l*. 3*s*.
36. 1,302*l*. 11*s*. 2*d*.; 1,291, 19*s*. 4*d*.
37. 1857, cylinders, 4*l*. 4*s*.; cleaning stores, 2*l*. 7*s*. 4*d*. 1858, cylinders, 4*l*. 4*s*.; cleaning stores, 2*l*. 7*s*. 4*d*.
38. 1857, oil, 583 gallons; wicks, 3½ gross. 1858, oil, 562 gallons; wicks, 3½ gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. 1857, 2*l*. 5*s*. total cost; 1858, 2*l*. 5*s*. total cost.
41. No fog signal apparatus.
42. Light is maintained from the Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. For quarter, 1852, 697*l*. 2*s*. 10*d*.. Ditto, 1858, 675*l*. 17*s*. 4*d*..—Total for 1852, 2,788*l*. 11*s*. 4*d*.
44. 1852, 615*l*. 6*s*. 3*d*., (including freight of stores.) 1858, 547*l*. 2*s*. 5*d*. ditto.
45. None.
46. None.
47. None.
48. There have not been any complaints that the present light is unnecessary or placed in an unsuitable position.
49. There have not been any complaints as to the efficiency of the light. As first exhibited, the light was shown to entrance of Courtmaesherry Bay, and in 1855 was, by direction of the Board of Trade, opened farther landward, so as to be visible within that bay.
50. By Committee of the Board of the Port of Dublin Corporation and by Superintendent of Lighthouses.
51. On circuit of inspection in 1857. Ditto in 1858.
52. Not known to have been extinguished.
53. At least two spare burners kept in readiness. Oil stored in oil store near to lighthouse.
54. Barometer and thermometer.
55. No tide signals.
56. Signal mast and flag.
57. Keeper on watch relieved in lightroom at 12 o'clock each night; keepers are changed from the station as changes from the other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

147.

FASTNET ROCK.

Summit of Fastnet Rock, off S.W. Coast of Cork.

Lat. 51° 20' 18" N., Long. 9° 36' 25" W.

3. The Port of Dublin Corporation have not any formally appointed local agents paid as such.
4. One light only.
5. 1847.
6. Cork Harbour Commissioners and others.
7. To form a substitute for the Cape Clear light, being four miles farther to the westward and southward, and less liable to be obscured by fogs.
8. 1st January 1854.
9. Built from the designs and under the direction of Mr. George Halpin, Engineer to Port of Dublin Corporation. The metal casing of the tower was procured by contract from Messrs. Mallet, of Dublin. The rock cutting and erection altogether by workmen of the Corporation.
10. Sea light (1st class).
11. Outer casing of tower of cast iron, filled with masonry for first store; remainder of tower lined with brickwork; tower marked by one horizontal red belt.
12. The metal tower serves as a large conductor.
13. 92 feet.
14. 148 feet.
15. 15 miles.
16. 19 miles.
17. 5007. Whole circle lighted.
18. Apparatus revolving light of the natural appearance or colour.
19. Brightest appearance of flash once every two minutes, gradually increasing and diminishing in strength, and at short distances, not totally obscured between the flashes.
20. During every night from sunset to sunrise.
21. Dioptric; upper and lower portions fitted with catadioptric zones.
22. 1st order; one large concentric wick burner lighted.
23. No alteration of apparatus since first lighted.
24. Wilkins, of London.
25. Ventilating tube through centre of dome of lantern.
26. None as yet; it is proposed to have a large fog bell erected, to be worked by machinery.
27. None.
28. 28 days.
29. Cost of lighthouse on the rock, 18,047*l.* 15*s.* 11*d.*, including cost of lantern, light apparatus, &c.
30. Buildings essentially necessary on rock completed.
31. 77*l.*
32. Not purchased; erected by Port of Dublin Corporation.
33. 1*l.* 8*s.*
34. General coating of paint once in each year, 57*l.* 15*s.* 5*d.* Paints procured by contract; workmanship not by contract.
35. Three keepers; two always on duty at the lighthouse. One at 64*l.* 12*s.* 4*d.*; two at 46*l.* 3*s.*; also two boatmen resident on the rock at 36*l.* 10*s.*
36. 2,036*l.* 19*s.* 10*d.*; 159*l.*
37. 1857, repairs, 8*l.* 3*s.* 10*d.*; cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.* 1858, repairs, 1*l.* 6*s.*; cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.*
38. 1857, oil, 412 gallons; wicks, 3*q.* gross. 1858, oil, 414 gallons; wicks, 3*q.* gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon; 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, 2*l.* 5*s.* total cost. 1858, 2*l.* 5*s.* total cost.
41. None.
42. From Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. 1852, not lighted. Quarter, 1858, 686*l.* 9*s.* 10*d.*
44. 1852, nil. 1858, 777*l.* 4*s.* 1*d.* (including cost of attendance of decked hooker, freight of stores, &c.)
45. None.
46. None.
47. None.
48. No complaint or representation as to the light being unnecessary or placed in an unsuitable position.
49. No complaint or representation made as to the efficiency of the light.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished during night since first lighted.
53. At least two spare burners kept in readiness. Oil stored on rock in lower part of tower; remainder stored in store at Rock Island, Crookhaven.
54. Barometer and thermometer.
55. Tide signals are not used; the lighthouse not being in the vicinity of any harbour, channel, or navigation depending on state of the tide.
56. Means of summoning attending hooker by signal flag. It has been proposed to establish a code of signals during the present year. Owing to distance from shore, signals by night could rarely be made, and signals by day would seldom be visible, unless in clear weather.
57. One keeper, relieved from duty on the rock every fortnight, weather permitting. Keeper on watch relieved in lightroom at 12 o'clock, midnight. Keepers changed from the station as required by changes at other stations.

148.

CROOKHAVEN.

South Coast of Ireland, on Rock Island Point, at North Side of Entrance of Crookhaven, County Cork.

Lat. 51° 28' 35" N., Long. 9° 42' 29" W.

3. No local authority.
4. One light.
5. 1838.
6. Inhabitants of Crookhaven and the vicinity.
7. To guide to or from Crookhaven, and to light the entrance and passage up the harbour.
8. 1843.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation.
10. Harbour light.
11. Cut stone; solid walls. Tower of circular form, coloured white.
12. No external conductor; wrought-iron handrail forms a continuous conductor from lantern to base of tower.
13. 45 feet.
14. 67 feet.
15. 9½ miles.
16. 13 miles.
17. 165° W. ½ N. to E. by S. ¼ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. Light coloured red on arc over the Alderman rock, at the suggestion of the Engineer of the Corporation. No other alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company. Wrought-iron frame, &c. by the workmen of the Corporation.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None.
27. None.
28. 37 days.
29. 9,151*l.* 7*s.*, including cost of lantern, light apparatus, &c., roads, ways, embankments, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 850*l.* (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 5*l.* 8*s.* 1*d.*
34. Coated with paint once every year, 22*l.* 6*s.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 382*l.* total cost.
37. 1857, cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, 5*l.* 12*s.* 10*d.*; cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 310 gallons; wicks, 6 gross. 1858, oil, 322 gallons; wicks, 6 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 1*l.* 1*s.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 1*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, nil. 1858, nil.
44. 1852, 205*l.* 11*s.* 3*d.* (including cost of freight of stores from Dublin). 1858, 14*l.* 9*s.* 5*d.*, ditto.
45. None.
46. None.
47. None.
48. Representation of opinion have been made; the light should have been placed on the Alderman rock on south side of the entrance.
49. Representation having been made that the light did not form a sufficient guide past the Alderman rocks, the light has, with the sanction of the Board of Trade, been coloured red over an arc extending across these rocks.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store near to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used. No application made for their adoption.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

149.

BEARHAVEN.

South-west Coast of Ireland, on Roanecarrig Island, Eastern Entrance to Bearhaven.

Lat. 51° 39' 10" N., Lon. 9° 44' 49" W.

3. No local authority.
4. One light.
5. 1838.
6. Coast Guard authorities.
7. As guide up Bantry Bay and within Bearhaven, and lighting the main or eastern entrance to Bearhaven.
8. 1847.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation; the walls of tower and dwelling built by contract by Mr. Howard, of Limerick; the lantern erected by workmen of the Corporation.
10. Harbour light.
11. Cut stone, silted walling, coated inside with cement; tower, circular, painted white with a red belt.
12. No separate external conductor. Usual arrangement of wrought-iron handrail of tower to form continuous conductor from lantern to base of tower.
13. 62 feet.
14. 55 feet.
15. 8½ miles.
16. 13 miles.
17. 196° E. by S. to W.N.W. ¼ N.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character or description of apparatus; burners adapted to use of rapeseed oil.
24. Reflectors from Soho Plate Co.; wrought-iron frame, &c., by workmen of the Corporation.
25. Through dome. There are also ventilating openings in blocking and floor of lightroom to regulate supply of air.
26. None used; none applied for.
27. None.
28. 12 days.
29. 14,308*l.*, 10*s.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 98*l.*, including cut stone blocking.
32. Not purchased; erected by Corporation.
33. 12*l.* 10*s.* 6*d.*; the repairs during these five years included some work not of usual occurrence.
34. Coated with paint once every year, 55*l.* 8*s.* 4*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers; one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
36. 710*l.* total cost.
37. 1857, cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 3*s.* 4*d.* 1858, repairs, 1*l.* 1*s.* 9*d.*; cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 3*s.* 4*d.*
38. 1857, oil, 641 gallons; wicks, 10 gross. 1858, oil, 631 gallons; wicks, 10 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross; 1*l.* 15*s.* total cost. 1858, 3*s.* 6*d.* per gross, 1*l.* 15*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, nil; total for 1852, nil. 1858, quarter, 1*l.* 0*s.* 2*d.*
44. 1852, 401*l.* 12*s.* 8*d.*, including freight of stores, boat attendance, &c. 1858, 384*l.* 3*s.* 5*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished; the ordinary catoptric lamp not liable to any accident which would cause its extinction.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining the lighthouse.
54. Barometer and thermometer.
55. Tide signals are not used; there has not been any application for them, Bearhaven being a deep water harbour.
56. Signal mast and flag; no means of communicating signals by night.
57. Keeper on watch relieved in lighthouse at 12 o'clock, midnight. Keepers are relieved from the station as removals from other lighthouses allow.

150.

SKELLIGS, LOWER.

West Coast of Ireland, on the Great Skelligs Rock off West Coast, Co. Kerry.

Lat. and Lon. See Special Return for Skelligs Upper Lighthouse.

3. No local authority.
4. There are two lights on the Great Skelligs Rock; the Lower Light is distant from the Upper Light 260 yards, bearing S. by E.
5. 1820.
6. The Knight of Kerry (Maurice Fitzgerald) and others.
7. A sea light being requisite off the south-west coast of Ireland, previously unlighted, the Skelligs Rocks were considered the best general position.
8. 1826.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone; solid walling; tower is of circular form, painted white.
12. No separate external conductor. Wrought-iron handrail forms a continuous conductor from lantern to base of tower.
13. 46 feet.
14. 175 feet.
15. 15½ miles.
16. 19 miles.
17. 236° N. by W. to E.S.E.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Cat. ptic.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 38 days.
29. 22,000*l.*, including cost of lantern, light apparatus, &c. Large portion of outlay in rock cutting to form platform for sites of lighthouse and dwellings; roadways cut from incline of solid rock.
30. Finished.
31. Lantern sash, 13 feet diameter, 8 feet high. 950*l.* (including cut stone blocking).
32. Not purchased; erected by Corporation.
33. 1*l.* 15*s.* 6*d.*
34. Coated with paint once every year, 45*l.* 5*s.* 6*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers; one at 64*l.* 12*s.* 4*d.*, one at 46*l.* 3*s.*
36. 855*l.* total cost.
37. 1857, repairs, 15*l.* 6*s.* 2*d.*; cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 3*s.* 4*d.* 1858, repairs, 3*l.* 11*s.*; cylinders, 5*l.* 8*s.*; cleaning stores, 2*l.* 3*s.* 4*d.*
38. 1857, oil, 635 gallons; wicks, 10 gross. 1858, oil, 634 gallons; wicks, 10 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross; 1*l.* 15*s.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 15*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 579*l.* 17*s.* 11*d.* 1858, quarter, 448*l.* 15*s.* 4*d.* Total for 1852, 2,319*l.* 11*s.* 6*d.*
44. 1852, 528*l.* 10*s.*, including boat attendance, freight of stores from Dublin. 1858, 407*l.* 10*s.* 2*d.*, ditto.
45. None.
46. None.
47. None.
48. No complaint or representation as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. One circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for. None required, the position being distant from any tidal navigation or tidal harbour.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are removed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

151.

SKELLIGS, UPPER.

West Coast of Ireland, on the Great Skelligs Rock off West Coast, Co. Kerry.

Lat. 51° 46' 14" N., Lon. 10° 32' 45" W.

3. No local authority.
4. There are two lights on the Great Skelligs Rock. Upper Light distant from the Lower Light 260 yards, bearing N. by W.
5. 1820.
6. The Knight of Kerry (Manrice Fitzgerald) and others.
7. A sea light being requisite off the south-west coast of Ireland, previously unlighted, the Skelligs Rocks were considered the best general position.
8. 1826.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone; solid walling; tower is of circular form, painted white.
12. No separate external conductor. Wrought-iron handrail forms a continuous conductor from lantern to base of tower.
13. 48 feet.
14. 372 feet.
15. 22½ miles.
16. 26 miles.
17. 240° N.E. by E. to S. by E.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 38 days.
29. 23,791. 15s. 10d., including cost of lantern, light apparatus, &c. Large portion of outlay in rock cutting to form platform for sites of lighthouse and dwellings; roadway cut from incline of solid rock.
30. Finished.
31. Lantern sash, 13 feet diameter, 8 feet high. 1,050*l.* (including cut stone blocking).
32. Not purchased; erected by Corporation.
33. 1*l.* 15s. 6d.
34. Coated with paint once every year, 45*l.* 5s. 6d. Paints procured by contract; workmanship not by contract.
35. Two keepers; one at 6*l.* 12s. 4d., one at 4*l.* 3s.
36. 895*l.* total cost.
37. 1857, repairs, 22*l.* 8s. 9d.; cylinders, 5*l.* 8s.; cleaning stores, 2*l.* 3s. 4d. 1858, cylinders, 5*l.* 8s.; cleaning stores, 2*l.* 3s. 4d.
38. 1857, oil, 722 gallons; wicks, 12 gross. 1858, oil, 731 gallons; wicks, 12 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Argand cotton wicks. 1857, 3s. 6d. per gross; 2*l.* 2s. total cost. 1858, 3s. 6d. per gross; 2*l.* 2s. total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per Special Return No. 1.
43. 1852, quarter, 57*l.* 17s. 11d. 1858, quarter, 448*l.* 15s. 4d. Total for 1852, 2,319*l.* 11s. 6d.
44. 1852, 528*l.* 10s., including boat attendance, freight of stores from Dublin, &c. 1858, 407*l.* 10s. 2d., ditto.
45. None.
46. None.
47. None.
48. No complaint or representation as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. None used in 1858. Barometer and thermometer kept at the lower house.
55. No tide signals used; none applied for. None required, the position being distant from any tidal navigation or tidal harbour.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers changed from the station as changes from other lighthouses require and allow.

152.

VALENTIA.

South-west Coast of Ireland, Cromwell's Fort Point, West Side of main Entrance of Harbour.

Lat. 51° 56' N., Lon. 10° 19' 16" W.

3. No local authority.
4. One light.
5. 1837.
6. Inhabitants of Valentia; the knight of Kerry.
7. To guide from seaward to the harbour; to lead through the easterly entrance channel, past the harbour rock, and to mark the ledge of rocks on which the lighthouse stands.
8. 1841.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Harbour light.
11. Chiefly cut stone; solid walls. The tower is circular; the walls of the old building of Cromwell's Fort have been retained for enclosure.
12. No separate external conductor. Wrought-iron handrail forms a continuous conductor from lantern to base of tower.
13. 48 feet.
14. 54 feet.
15. 8½ miles.
16. 13 miles.
17. 160° N.W. to S.S.E. ½ E.
18. Fixed. Light of the natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company. Wrought-iron frame, &c. by the Corporation.
25. Through dome. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used; none applied for.
27. None.
28. None.
29. 10,399*l.* 16s. 6d., including cost of lantern, light apparatus, approaches, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 669*l.*, including cut stone blocking.
32. Not purchased; erected by Corporation.
33. 5*l.* 11s. 9d.
34. Painted once every year, 9*l.* 14s. 10d. Paints procured by contract; workmanship not by contract.
35. One keeper at 6*l.* 12s. 4d.
36. 475*l.*; 50*l.* Total 525*l.*
37. 1857, cylinders, 3*l.* 12s.; cleaning stores, 1*l.* 1s. 8d. 1858, repairs, 15*l.* 1s. 3d.; cylinders, 3*l.* 12s.; cleaning stores, 1*l.* 1s. 8d.
38. 1857, oil, 380 gallons; wicks, 6 gross. 1858, oil, 379 gallons; wicks, 6 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Argand cotton wick. 1857, 3s. 6d. per gross; 1*l.* 1s. total cost. 1858, 3s. 6d. per gross; 1*l.* 1s. total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 7*l.* 2s. 9d. 1858, quarter, 6s. 5d. Total for 1852, 28*l.* 11s.
44. 1852, 237*l.* 7s. 8d. including boat attendance, freight of stores, &c. 1858, 159*l.* 13s., ditto.
45. None.
46. None.
47. None.
48. No complaints or representation.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag; no night signals.
57. One keeper. Keeper changed from the station as changes at other lighthouses require and allow.

153.

SAMPHIRE ISLAND.

West Coast of Ireland, in Tralee Bay,
on lesser Samphire Island.

Lat. 52° 16' 19" N., Lon. 9° 53' 14" W.

3. No local authority.
4. One light.
5. 1846.
6. Shipowners of Tralee.
7. To guide vessels to the entrance of Tralee Bay and past the outer rocks to Samphire Island, and to the anchorage within Samphire Island.
8. 1854.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation. Fuilt under his direction by the workmen of the Corporation, not by contract.
10. Harbour light.
11. Dressed stone, solid wall, coated with cement inside.
12. No external lighting conductor. Usual arrangement of iron handrail of tower so as to form continuous conductor from lantern to base of tower.
13. 42 feet.
14. 56 feet.
15. 8½ miles.
16. 9 miles.
17. N. ¼ E. to E. by S. ¼ S.
18. Fixed. The light is white from E. by S. ¼ S. to W.N.W., and red seaward from W.N.W. to N. ¼ E.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 4th order.
23. None.
24. Chance, of Birmingham.
25. Through centre of dome. Ventilation also in floor and blocking of lightroom to regulate supply of air.
26. No fog signals at this station.
28. 9 days.
29. 7,000*l.* 17*s.* 1*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. 472*l.*, including stone blocking.
32. Not purchased; erected by the workmen of the Corporation.
33. 10*s.*
34. General coating of paint once in each year, 15*l.* 4*s.* Paints procured by contract; workmanship not by contract.
35. One keeper at 40*l.* 3*s.*
36. 20*l.*
37. 1857, cylinders, 14, 4*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, cylinders, 1*l.* 4*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 80 gallons; wicks, 2 gross. 1858, oil, 85 gallons; wicks, 2 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 8*s.* total cost. 1858, 8*s.* total cost.
41. Nil.
42. Light maintained from Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, nil. 1858, quarter, 2*l.* 10*s.*
44. 1852, not lighted. 1858, 208*l.* 10*s.* 9*d.*, including boat attendance, freight of stores, &c.
45. None.
46. None.
47. None.
48. No complaints or representation as to the light being unnecessary or in an unsuitable position.
49. In July 1858, Tralee Harbour Commissioners represented that the light is not sufficiently powerful. The matter is still under consideration.
50. By Committee of the Port of Dublin Corporation.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished during night since established.
53. At least two spare burners kept in readiness.
54. None in 1858.
55. No tide signals at this station. There has not been any application to have tide signals shown.
56. Signal mast and flag.
57. One keeper. Keeper changed from the station as required by changes at other stations.

154.

TARBERT ROCK.

West Coast of Ireland, River Shannon, on
tidal Rock off North Side of Tarbert
Island.

Lat. 52° 35' 30" N., Lon. 9° 21' 47" W.

3. No local authority.
4. One light.
5. 1829.
6. Chamber of Commerce, of Limerick.
7. To light the channel of the Shannon westward and eastward of Tarbert rock; to mark the tidal rock on which it stands; and to guide into the anchorage of Tarbert rocks.
8. 1834.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation. The walling of tower built by contract by Mr. Howard, of Limerick. The lantern erected by the Corporation.
10. Harbour light.
11. Cut stone; solid wall, coated with cement inside, circular, painted white outside. Identified by its position outside of Tarbert Island at outer end of a metal bridgeway.
12. No separate external conductor. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to lower floor of tower.
13. 84 feet.
14. 54 feet.
15. 8½ miles.
16. 13 miles.
17. 267° S. ¼ W. to W. ¼ N.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Subo Plate Company. Wrought-iron frame by workmen of the Corporation.
25. Through dome as in the other catoptric lights. Ventilators also in blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. Not registered.
29. 10,112*l.* 15*s.* 3*d.*, including cost of lantern and light apparatus, metal bridge from tower on rock to Tarbert Light.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 99*l.*, including cut stone blocking.
32. Not purchased; erected by Corporation.
33. 2*l.* 12*s.* 7*d.*
34. Coated with paint once every year, 41*l.* 18*s.* 8*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 61*l.* 12*s.* 4*d.*
36. 771*l.* (total cost).
37. 1857, cylinders, 3*l.* 2*s.*; cleaning stores, 1*l.* 9*s.* 8*d.* 1858, repairs, 1*l.* 7*s.* 8*d.*; cylinders, 2*l.* 3*s.*; cleaning stores, 1*l.* 3*s.* 6*d.*
38. 1857, oil, 673 gallons; wicks, 10 gross. 1858, oil, 679 gallons; wicks, 10 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 1*l.* 15*s.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 15*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 54*l.* 14*s.* 10*d.* 1858, quarter, 111*l.* 7*s.* 8*d.* Total for 1852, 218*l.* 19*s.* 6*d.*
44. 1852, 262*l.* 12*s.* 4*d.*, including cost of freight of oil and other stores from Dublin. 1858, 362*l.* 4*s.* 8*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation as to the light being unnecessary.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store.
54. Barometer and thermometer.
55. No tide signals used; no application to have them used. The River Shannon is a deep water navigation, considerably eastward of Tarbert.
56. Signal mast and flag; no night signals used.
57. One keeper. Keeper changed from the station as changes at other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

155.

BEEVES ROCK.

River Shannon, on North Side of the Main Channel.

Lat. 53° 39' N., Lon. 9° 1' 18" W.

3. No local authority.
4. One light.
5. 1846.
6. Application made chiefly with reference to proposed light on Foynes Island by Lord Montecagle and by the Chamber of Commerce, Limerick.
7. To light that reach of the Shannon in which it is situate, and to guide in the channel eastward and west of the Beeves Rock, also to mark that tidal rock. The Beeves light also guides to entrance of the Ferguson.
8. 1854.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. The masonry built by contract by Mr. W. Burgess, of Limerick. The lantern erected by workmen of the Corporation.
10. Harbour light.
11. Tower and dwelling of cut stone, solid, without separate inner wall. Coated inside with cement. Painted white outside. At once recognised, from its insulated position, and the rock being covered unless at low water.
12. Usual arrangement of iron handrail to form continuous conductor to base of tower. No external conductor.
13. 74 feet.
14. 55 feet.
15. The land limits the range of this light.
16. Limited to reach of the Shannon in which it is situate.
17. 360°. Lighted all around the circle.
18. Fixed. White, as seen between E. $\frac{1}{2}$ N. and N. W. by W. Red to north of rock.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 3rd order.
23. No alteration in description or character of illuminating apparatus since first lighted.
24. Chance, of Birmingham.
25. Central tube through dome of the lantern.
26. No fog signals.
27. None.
28. 20 days.
29. 9,494l. 8s. 1d., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 10 feet high; 696l. (including stone blocking.)
32. Not purchased. Was built by the Port of Dublin Corporation.
33. 4l. 7s. 10d.
34. General coating of paint once in each year, 21l. 14s. 5d. Paints procured by contract. Workmanship not by contract.
35. Two keepers, one at 46l. 3s.; one at 36l. 10s.
36. 349l. 16s.; 91l. Total, 440l. 16s.
37. 1857, cylinders, 1l. 4s.; cleaning stores, 1l. 7s. 3d. 1858, repairs, 3l. 9s. 11d.; cylinders, 1l. 4s.; cleaning stores, 1l. 7s. 3d.
38. 1857, oil, 142 galls.; wicks, $\frac{1}{2}$ gross. 1858, oil, 142 galls.; wicks, $\frac{2}{3}$ gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon; 1858, 3s. 5d. per gallon.
40. Cotton concentric wick. 1857, 1l. 0s. 3d. total cost; 1858, 1l. 0s. 3d. total cost.
41. None.
42. From Mercantile Marine Fund. Revenue is collected and paid as per statement in Special Return No. 1.
43. Not lighted in 1852. 1858, quarter, 11l. 7s. 6d.
44. 1852, 401l. 12s. 6d. 1853, 394l. 12s. 5d., including boat attendance and freight of stores.
45. None.
46. None.
47. None.
48. There has not been any representation as to the light being unnecessary or placed in an unsuitable position.
49. There has not been any complaint as to the efficiency of the light since first established.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. The light has not been known to have been extinguished.
53. Two spare lamp burners kept in readiness. Oil stored in oil store, forming portion of same building.
54. None in 1858.
55. Tide signals not used; there has not been any application or requisition to have them used at the station. The main channel of the adjacent reach of the Shannon is navigable at low water.
56. Signal mast and flag only as yet.
57. Keeper on watch is relieved in lightroom at 12 o'clock midnight. Keeper changed from the station as required by changes at other stations.

156.

KILCREDANE.

West Coast of Ireland, North Side of River Shannon, Co. Clare.

Lat. 52° 34' 47" N., Lon. 9° 42' 34" W.

3. No local authority.
4. One light.
5. 1818.
6. Chamber of Commerce, Limerick.
7. To light reaches of the Shannon, eastward and westward of Kilcredane Point.
8. 1824.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his direction by workmen of the Corporation, not by contract.
10. Harbour light.
11. Cut stone; solid walls; the tower is of circular form, coloured white.
12. No separate external conductor. Usual arrangement of wrought-iron handrail forms continuous conductor from lantern to base of tower.
13. 43 feet.
14. 133 feet.
15. 13½ miles.
16. 16 miles. Red light not seen at greater distance than sea horizon, unless in very clear weather.
- 17.
18. Fixed. The light is coloured red to seaward, and is shown of the natural appearance, white, eastward to the river.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 10 days.
29. including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, feet diameter, feet high.
32. Not purchased; erected by the Corporation.
33. 3l. 10s. 5d.
34. Coated with paint once every year, 23l. 16s. Paints procured by contract; workmanship not by contract.
35. One keeper at 64l. 12s. 4d.
36. 558l. total cost.
37. 1857, cylinders, 3l. 12s.; cleaning stores, 1l. 9s. 3d. 1858, repairs, 9l. 14s. 4d.; cylinders, 3l. 12s.; cleaning stores, 1l. 9s. 3d.
38. 1857, oil, 515 gallons; wicks, 8 gross. 1858, oil, 518 gallons; wicks, 8 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Argand cotton wicks. 1857, 3s. 6d. per gross; 1l. 8s. total cost. 1858, 3s. 6d. per gross; 1l. 8s. total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 34l. 1s. 2d. 1858, quarter, 11l. 14s. 3d. Total for 1852, 136l. 4s. 8d.
44. 1852, 257l. 16s. 1d., including cost of freight of stores, &c., from Dublin. 1858, 226l. 16s. 4d., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. None in 1858.
55. No tide signals used; no application made to have them used.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

157.

LOOPHEAD.

West Coast of Ireland, North Side of Entrance to the Shannon, near to extremity of the Point.

Lat. $52^{\circ} 33' 38''$ N., Lon. $9^{\circ} 55' 54''$ W.

3. No local authority.
4. One light.
5. Transferred by Revenue Board in 1810.
6. Not known.
7. As the most prominent point between the Shannon and Galway Bay, necessary as a sea light, and as guiding from seaward to the entrance of the Shannon.
8. 1802, exhibition of old light. 1853, first exhibition of light from present tower.
9. Present lighthouse designed by the late George Halpin, Engineer to the Port of Dublin Corporation. The tower built by contract by Mr. Burgess, of Limerick. The lightroom erected by workmen of the Corporation.
10. Sea light.
11. Cut stone round tower; solid wall coated with cement inside; painted white outside; identified from its position at end of the Loophead.
12. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to base of tower. No separate external conductor.
13. 75 feet.
14. 277 feet.
15. 19 miles.
16. 23 miles.
17. 285° N. E. by F. $\frac{1}{4}$ E. to S. E. by E.
18. Fixed light of the natural appearance.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 1st order.
23. None.
24. Mr. Wilkins, of London.
25. Ventilating tube through centre of dome; ventilating open in floor and in blocking of lightroom, to regulate supply of air.
26. No fog signals at this station.
27. None.
28. 10 days.
29. 6,684l. 11s. 5d., including cost of lantern, light apparatus, and present tower, but not including old dwellings.
30. Finished.
31. Lantern sash 13 feet diameter, 10 feet high; 752l. 6s. 3d., including stone blocking.
32. Not purchased; erected by the Port of Dublin Corporation. The tower walling by contract.
33. 9l. 1s. 8d.
34. General coating of paint once in each year, 46l. 4s. 8d. Paints procured by contract. Workmanship not by contract.
35. Two keepers, one at 64l. 12s. 4d., one at 46l. 5s.
36. 1,756l. 8s. 4d.; 180l. 7s. 8d.—Total, 1,936l. 11s.
37. 1857, cylinders, 4l. 4s.; cleaning stores, 2l. 7s. 4d. 1858, cylinders, 4l. 4s.; cleaning stores, 2l. 7s. 4d.
38. 1857, oil, 518 gallons; wicks, 34 gross. 1858, oil, 521 gallons; wicks, 34 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon; 1858, 3s. 5d. per gallon.
40. Cotton concentric wick. 1857, 2l. 5s. total cost. 1858, 2l. 5s. total cost.
41. None at this station.
42. From the Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 67l. 2s. 7d.; 1858, quarter, 22l. 2s. 3d.—Total for 1852, 268l. 10s. 4d.
44. 1852, 649l. 3s. 2d. (including freight of stores.) 1858, 438l. 8s. 6d. ditto.
45. None.
46. None.
47. None.
48. There have not been any representations as to the light being unnecessary or placed in an unsuitable position.
49. There have not been any complaints or representation as to the efficiency of the light.
50. By Committee of the Board of the Port of Dublin Corporation and by Superintendent of Lighthouses.
51. On circuit of inspection in 1857. Ditto in 1858.
52. Not known to have been extinguished between 1848 and 1858.
53. At least two spare burners kept in readiness.
54. Barometer and thermometer.
55. No tide signals used.
56. Signal mast and flag, no code of signals as yet.
57. Keeper on watch is relieved in lightroom at 12 o'clock midnight. Keepers are changed from the station as changes from the other stations require and allow.

158.

ARRAN ISLANDS, SOUTH.

West Coast of Ireland, on Inisheer Island, off Coast of County Galway.

Lat. $53^{\circ} 2' 40''$ N., Lon. $9^{\circ} 31' 30''$ W.

3. The Port of Dublin Corporation have not any formally appointed local agents paid as such; correspondence is held directly with the lightkeepers.
4. One light.
5. 1850. Note.—Light on the Great Island of Arran was established in 1817, discontinued in 1854.
6. In 1850 the Galway Harbour Commissioners stated objections to position of old lighthouse on Large Island; the present sites were selected by Port of Dublin Corporation and approved by the Trinity Board.
7. To mark the southern extremity of the chain of the Aran Islands, and to light the south sound leading from the Atlantic into Galway Bay.
8. 1st December 1857.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation and Superintendent of Lighthouses, from whose plans and specifications, and under whose directions the masonry of the tower and dwellings was built by contract. Contractors, Messrs. Crowe, of Dublin.
10. First-class sealight.
11. Limestone, chert walling of solid cut stone without a separate inner wall.
12. Wrought-iron handrail in tower forms a continuous conductor from lantern to base. No separate external conductor.
13. 112 feet.
14. 104 feet.
15. 11½ miles.
16. 15 miles.
17. 225° E. by N. to N.W. $\frac{1}{4}$ N.
18. Fixed. Light of natural appearance, white, unless in direction of Finnis Rock, in which it is shown of red colour.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric, having catadioptric zones above and below refracting belt.
22. 1st order; one large concentric wick burner.
23. Apparatus is modern, and there has not been any alteration in its description or character since first exhibited.
24. Messrs. Chance, of Birmingham.
25. Central ventilating tube. The ventilating tubes of dioptric lights are all on construction known as Faraday's.
- 26, 27. None.
28. 16 days.
29. 14,324l. 2s. 4d., including cost of lantern, light apparatus, dwellings, roadways, &c.
30. All buildings essentially necessary are completed.
31. Lantern sash 13 feet diameter, 10 feet high: 850l.; 112l.; total, 962l.
32. Lighthouse was not purchased; erected by the Port of Dublin Corporation.
33. Buildings being new, did not require repair to close of year 1858.
34. General coating of paint once each year, 16l. 15s. 10d. Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64l. 12s. 4d.; one at 46l. 5s.
36. 1,150l.; 95l. Total, 1,245l.
37. 1857, nil. 1858, cylinders, 4l. 4s.; cleaning stores, 2l. 5s. 4d.
38. 1857, not lighted until December. 1858, oil, 399 galls.; wicks, 34 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gall. 1858, 3s. 5d. per gall.
40. Cotton concentric wick. 1857, not lighted until December. 1858, 2l. 5s. total cost.
41. None.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. Quarter 1852, not lighted. Quarter 1858, 1l. 6s. 7d.
44. 1852, nil. 1858, 320l. 12s. 11d., (including cost of attendance of cutter, freight of stores, &c.)
- 45, 46, 47. None.
48. None; on the contrary, the Commissioners who examined Galway Bay reported that the approaches to it were admirably lighted.
49. No complaints or representations made.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. By Superintendent in 1857; on circuit of inspection in 1858.
52. Not known to have been extinguished during night since lighted.
53. At least two spare lamp burners kept in readiness. (Oil stored in oil store adjoining principal keeper's dwelling and near to lightroom.)
54. Barometer and thermometer.
55. No tide signals used. Lighthouse not in the immediate vicinity of any tidal harbour or tidal navigation.
56. Mast and flag in use. Code of signals will this year be exhibited at this and a few of the principal rock stations.
57. Lightkeepers are relieved from watch in lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

159.

ARRAN ISLANDS, NORTH.

On Rock the most Northern and Western of the Chain of Islands Westward of Galway Bay.

Lat. 53° 8' 55" N., Lon. 9° 51' 30" W.

3. No local authority. (The owner of the Hooker, attending for the time being, transacts at Galway any requisite business for the lightkeepers, such as purchase of provisions.)
4. One light.
5. 1850.

Note.—Light on the Great Island of Arran was established in 1817, discontinued in 1854.

6. In 1850 the Galway Harbour Commissioners stated objections to position of old lighthouse on large island. The present sites were selected by the Port of Dublin Corporation, and approved by the Trinity Board.
7. As marking the northern extremity of the chain of Arran Island, being also sufficiently to the westward to serve as a passing light, and as marking the entrance of the North Channel into Galway.
8. 1st December 1857.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation and Superintendent of Lighthouses, from whose plans and specification, and under whose supervision the masonry of tower and dwellings was built by contract. Contractors, Messrs. Crowe, of Dublin.
10. Sea light. First class.
11. Limestone. Solid masonry of cut stone, without any separate inner wall, interior carefully pointed with cement, and not coated.
12. Wrought-iron handrail in tower forms a continuous conductor from lantern to base. No separate external conductor.
13. 101 feet.
14. 115 feet.
15. 12 miles.
16. 15 miles.
17. 326° E.S.E. to S. E. by S.
18. Revolving. The light of natural colour, white, gradually increasing and decreasing in strength.
19. Brightest appearance or flash once in every 3 minutes.
20. From sunset to sunrise during the whole night.
21. Dioptric.
22. 1st order, one concentric wick burner lighted.
23. The illuminating apparatus is modern, having the upper and lower portions arranged on the holophotal system, and there has not been any alteration in the description or character of the illuminating apparatus since first lighted.
24. Wilkins, of Long Acre, London.
25. Ventilating tube through centre of dome of lantern.
26. None.
27. None.
28. 15 days.
29. 15,023*l.* 1*s.* 5*d.*, including cost of lantern, lighthouse, apparatus, roadways, &c.
30. All buildings necessary completed.
31. Lantern sash 13 feet diameter, 10 feet high; 850*l.*; 125*l.*; total, 975*l.*
32. Not purchased. Built by the Port of Dublin Corporation.
33. Buildings being new, did not require repairs to close of 1858.
34. General coating of paint once in each year, 20*l.* 0*s.* 5*d.* Paints procured by contract. Workmanship not by contract.
35. Two keepers, one at 6*l.* 12*s.* 4*d.*, one at 4*l.* 2*s.*
36. 1,727*l.*; 119*l.* Total 1,846*l.*
37. 1858, cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.*
38. 1857, not lighted until December. 1858, oil, 400 gallons; wicks, 31 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon; 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, not lighted until December. 1858, 2*l.* 5*s.* total cost.
41. Nil.
42. From Mercantile Marine Fund.
43. 1852, quarter, 45*l.* 1*s.* 5*d.*; 1853, quarter, 11*l.* 19*s.* 9*d.* Total for 1852, 18*l.* 6*s.* 8*d.*
44. 1858, 336*l.* 10*s.* (including attendance of cutter and freight of stores.)
45. None.
46. None.
47. None.
48. No complaint or representation concerning position of the light since exhibited. Commissioners who examined Galway Bay reported that the approaches were extremely well lighted.
49. No complaint or representation as to the efficiency of the light since first exhibited.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. 1st December 1857, by superintendent on circuit of inspection in 1858.
52. Not extinguished during night since first exhibited.
53. At least two spare burners kept in readiness. Oil stored in the oil store.
54. Barometer and thermometer.
55. No tide signals. This light is not in the vicinity of any tidal harbour or navigation.
56. Mens by signal flag of summoning attendance of boat by day, if required.
57. Relieved from watch in lightroom at 12 o'clock midnight. Changed from station consistently with requirement for changes at other stations.

160.

MUTTON ISLAND.

West Coast of Ireland, on Island in Galway Harbour.

Lat. 53° 15' 13" N., Lon. 9° 3' 10" W.

3. No local authority.
4. One light.
5. 1810.
6. Corporation and merchants of Galway.
7. To light Galway Bay from its entrance to the inner roadstead, and to guide past Mutton Island.
8. 1817.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation; built under his direction by the workmen of the Corporation, and not by contract.
10. Harbour light.
11. Cut stone; solid walling; the tower is circular, coloured white, and known from its position on small island.
12. No separate external conductor. Wrought-iron handrail forms a continuous conductor from lantern to base of tower.
13. 34 feet.
14. 33 feet.
15. 6½ miles.
16. 11 miles.
17. 253° N.E. to W.N.W. ½ N.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None.
27. None.
28. 30 days.
29. 4,020*l.* 3*s.* 5*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, feet diameter, feet high.
32. Not purchased.
33. 2*l.*
34. Coated with paint once every year, 8*l.* 8*s.* 2*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 6*l.* 12*s.* 4*d.*
- 36.
37. 1857, repairs, 15*l.* 16*s.* 11*d.*; cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 5*s.* 8*d.* 1858, cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 5*s.* 8*d.*
38. 1857, oil, 480 gallons; wicks, 8 gross. 1858, 487 gallons; wicks, 8 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 0*d.* per gross; total cost, 1*l.* 8*s.* 1858, 3*s.* 0*d.* per gross; total cost, 1*l.* 8*s.*
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 1*l.* 0*s.* 8*d.* 1858, quarter, 3*l.* 10*s.* 8*d.* Total for 1852, 6*l.* 2*s.* 8*d.*
44. 1852, 222*l.* 14*s.* 9*d.*, including boat attendance, freight of stores, &c. from Dublin. 1858, 311*l.* 8*s.* 8*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation made as to the light being unnecessary or placed in an unsuitable position.
49. No complaint made as to the efficiency of the light, but representations were made that an additional light was required on the Black Rock farther out in the bay.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store near to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used.
56. Signal mast and flag.
57. One Keeper. Keeper changed from the station as changes from other lighthouses require and allow.

161.

SLYNE HEAD, SOUTH.

West Coast of Ireland, on outermost Islet
off the Head, Co. Galway.

Lat. and Lon. stated in Return for North Lighthouse.

3. The lightkeepers manage all the business of the station under direction from Dublin.
4. Special return given for Slyne Head North Lighthouse, which is distant 142 yards, bearing $N \frac{1}{2} E$.
5. 1810, 1819.
6. Corporation of Galway and others.
7. As the best position for a sea light, being at the outer end of a chain of islets and rocks extending westward of a projecting headland, and as marking that point, and indicating danger, northward and southward of it.
8. 1836.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation. Built by the workmen of the Corporation, and not by contract.
10. Sea light.
11. Stone tower; solid wall; coated with cement inside; painted white outside. Identified by the prominent position of the chain of low islets, and by the second tower, or north lighthouse.
12. Usual arrangement of wrought iron handrail to form continuous conductor from lantern to base of tower. No separate external conductor.
13. 79 feet.
14. 115 feet.
15. 12 miles.
16. 15 miles.
17. $312^{\circ} S. E. \frac{1}{2} E$. to E . by N .
18. Fixed light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the description or character of illuminating apparatus since 1845.
24. Reflectors from Soho Plate Co. Frame by workmen of the Corporation.
25. Ventilator through dome of lantern. Ventilators also in floor and blocking of lightroom to regulate the supply of air.
26. No fog signals required at this station.
27. None.
28. 22 days.
29. 20s. 2d., including cost of lantern, light apparatus, &c.
30. Finished.
31. 90sL (including stone blocking).
32. Lighthouse erected by workmen of the Corporation; was not purchased.
33. 12l. 15s. 3d.
34. General coating of paint once in each year, 31l. 12s. 9d. Paints procured by contract; workmanship not by contract.
35. One keeper at 64l. 12s. 4d.; one ditto at 46l. 3s.
36. 827l.; 150l. Total, 977l.
37. 1837, cylinders, 7l. 4s.; cleaning stores, 2l. 9s. 4d. 1858, repairs, 31l. 14s. 11d.; cylinders, 7l. 4s.; cleaning stores, 2l. 9s. 4d.
38. 1837, oil, 868 gallons; wicks, 13 gross. 1858, oil, 888 gallons; wicks, 13 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon; 1858, 3s. 5d. per gallon.
40. Argand cotton wicks. 1857, 3s. 6d. per gross; 2l. 5s. 6d. total cost. 1858, 3s. 6d. per gross; 2l. 5s. 6d. total cost.
41. Nil.
42. From the Mercantile Marine Fund.
43. 1852, quarter, 41l. 7s. 11d. 1858, quarter, 8l. 16s. 3d. Total for 1852, 165l. 11s. 7d.
44. 1852, 586l. 12s. 11d., including boat attendance and freight of stores. 1858, 407l. 10s. 2d., ditto.
45. None.
46. None.
47. None.
48. No complaints or representation.
49. No complaints or representation as to the efficiency of the light.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished during night since lighted.
53. Spare lamp and burner kept ready. Oil stored in oil store near to lighthouse.
54. Barometer and thermometer.
55. No tide signals used. Tide signals not requisite, station being at a distance from any tidal harbour or tidal channel.
56. Signal mast and flag.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other stations require and allow.

162.

SLYNE HEAD, NORTH.

West Coast of Ireland, on outermost Islet
of the Head, County Galway.Lat. $53^{\circ} 29' 58'' N.$, Lon. $10^{\circ} 14' 1'' W$.

3. The lightkeepers manage all the business of the station under direction from Dublin.
4. One light, which is distant from the south lighthouse on the same islet 142 yards, bearing $N \frac{1}{2} E$.
5. 1819.
6. Corporation of Galway and others.
7. As the best position for a sea light, being at the outer end of a chain of islets and rocks extending westward of a projecting headland, and as marking that point, and indicating danger northward and southward of it.
8. 1836.
9. Designed by (the late) George Halpin, Engineer to Port of Dublin Corporation. Built by workmen of the Corporation; buildings not by contract.
10. Sea light.
11. Tower of stone masonry; solid wall, without a separate inner wall, coated with cement inside; painted white outside; identified by the appearance of two towers at the extremity of a chain of low islets and rocks.
12. No external conductor. Usual arrangement of iron handrail to form continuous conductor from lantern to base of tower.
13. 79 feet.
14. 126 feet.
15. 13 miles.
16. 18 miles.
17. 337° . Light obscured by lantern in the direction of Slyne Head.
18. Revolving; showing one red and two white faces.
19. Makes a complete revolution in six minutes; shows one face or flash every two minutes; the red flash appearing every sixth minute.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in description or character of illuminating apparatus since 1845, farther than modification of the burners to suit the burning of rapeseed oil.
24. Reflectors made by the Soho Plate Co.; frame by workmen of the Corporation; revolving machine by Davi, of Edinburgh.
25. Ventilator through dome of lantern; ventilators are placed in floor and blocking of lightroom to regulate supply of water.
26. No fog signals at this station.
27. None.
28. 12 days.
29. 20s. 2d., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 90sL (including stone blocking).
32. Lighthouse erected by workmen of the Corporation; was not purchased.
33. 12l. 15s. 3d.
34. General coating once each year, 31l. 12s. 9d. Paints procured by contract; workmanship not by contract.
35. Two keepers; one at 64l. 12s. 4d., one at 46l. 3s.
36. 892l.; 288l.; 150l. Total, 1,280l. revolving machine.
37. 1857, cylinders, 7l. 4s.; cleaning stores, 2l. 9s. 4d. 1858, repairs, 31l. 14s. 5d.; cylinders, 7l. 4s.; cleaning stores, 2l. 9s. 4d.
38. 1857, oil, 894 gallons; wicks, 14 gross. 1858, oil, 942 gallons; wicks, 14 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Argand cotton wick. 1857, 3s. 6d. per gross; 2l. 9s. total cost; 1858, 3s. 6d. per gross; 2l. 9s. total cost.
41. None at this station.
42. Maintained from the Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 41l. 7s. 11d. 1858, quarter, 8l. 16s. 3d. Total for 1852, 165l. 11s. 7d.
44. 1852, 586l. 12s. 11d., including cost of boat attendance, freight of stores, &c. 1858, 407l. 10s. 2d. ditto.
45. None.
46. None.
47. None.
48. There have not been any representations that the light is unnecessary or placed in an unsuitable position.
49. There have not been any complaints as to the efficiency of the light.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection, 1857; ditto, 1858.
52. Not known to have been extinguished during night since 1848.
53. Spare lamp and burner kept ready. Oil stored in oil store near to lighthouse.
54. None at the north house to 1858; barometer and thermometer at Slyne Head South Lighthouse.
55. No tide signals used; tide signals not requisite, station being at a distance from any tidal harbour or tidal channel.
56. Signal mast and flag.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

163.

CLARE ISLAND.

West Coast of Ireland, on North Point of Clare Island, Westward of Clew Bay, County Mayo.

Lat. 53° 49' 30" N., Long. 9° 59' 30" W.

3. No local authority.
4. One light.
5. Not ascertained.
6. Not ascertained.
7. The Revenue Board considered this light requisite as a sea light off the west coast of Mayo to guide into Clew Bay and its inner anchorage.
8. 1806.
10. Sea light.
11. Chiefly cut stone, solid walling; tower is of circular form, painted white.
12. No separate external conductor. Usual arrangement of wrought-iron handrail.
13. 39 feet.
14. 841 feet.
15. 21 miles.
16. 26 miles.
17. 247°. S.S.E. $\frac{1}{2}$ E. to W. $\frac{1}{2}$ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Same as at other catoptric lights, through dome of lantern. There are also ventilators in the blocking and floor of light-room to regulate supply of air.
26. None used.
27. None.
28. None.
29. 9,297*l.* 13*s.* 6*d.*
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high: *l.*
32. Not purchased.
33. 50*l.* 10*d.*, including special repairs of buildings.
34. Coated with paint once every year, 53*l.* 13*s.* 2*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers; one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
37. 1857, repairs, 26*l.* 12*s.* 11*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 9*s.* 4*d.* 1858, repairs, 27*l.* 5*s.* 5*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 9*s.* 4*d.*
38. 1857, oil, 790 gallons; wicks, 13 gross. 1858, oil, 792 gallons; wicks, 13 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 5*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 5*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 46*l.* 3*s.* 6*d.* 1858, quarter, 9*l.* 17*s.* 11*d.* Total, 1852, 18*l.* 14*s.*
44. 1852, 455*l.* 19*s.* 7*d.*, including boat attendance, freight of stores, &c. from Dublin. 1858, 378*l.* 3*s.* 11*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto in 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals; no application made to have them used; station distant from a tidal harbour.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other lighthouses require and allow.

164.

INISHGORT.

West Coast of Ireland, on North Side of Entrance Channel to Westport, between the Islands of Clew Bay.

Lat. 53° 49' 34" N., Lon. 9° 40' 12" W.

3. No local authority.
4. One light.
5. Not ascertained, light having been transferred to the Port of Dublin Corporation.
6. Not ascertained.
7. To guide to and from seaward to the inner channels of Clew Bay and the anchorage within Inishgort Island.
8. 1827.
9. Present lighthouse designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Harbour light.
11. Chiefly cut stone; solid walling; coated inside with cement. Tower is of circular form, painted white.
12. No separate external conductor. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to base of tower.
13. 26 feet.
14. 36 feet.
15. 6½ miles.
16. 11 miles.
17. 225° N.W. by N. to E. by S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. None.
29. 3,180*l.* 0*s.* 10*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, 9 feet diameter, 6 feet high. (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 4*l.* 16*s.* 3*d.*
34. Coated with paint once every year, 20*l.* 5*s.* 3*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 329*l.* total cost.
37. 1857, repairs, 10*l.* 15*s.* 8*d.*; cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, repairs, 9*l.* 2*s.* 7*d.*; cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 290 gallons; wicks, 5 gross. 1858, oil, 289 gallons; wicks, 5 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 14*l.* 10*s.* 1*d.* 1858, quarter, 1*l.* 7*s.* 8*d.* Total for 1852, 58*l.* 0*s.* 2*d.*
44. 1852, 263*l.* 11*s.* 6*d.*, including boat attendance, freight of stores, &c. from Dublin. 1858, 393*l.* 1*s.* 11*d.*, ditto.
45. None.
46. None.
47. None.
48. No complaint or representation as to the position of the light.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto in 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store near to the lighthouse.
54. None in 1858.
55. No tide signals used; no application made to have them used.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

165.

EAGLE ISLAND, EAST.

West Coast of Ireland, on Islet off the West Coast of the Mullet, County Mayo.

Lat. 54° 17' N., Lon. 10° 6' W.

3. No local authority.
4. One light, distant from the Eagle Island West Lighthouse 132 yards.
5. 1850.
6. Want of a light off west coast of Mayo, represented by Commanders Blake and Glascock, commanders of cruisers off the west coast of Ireland, and by others.
7. A sea light being required off the Salient, north-west coast of Mayo. The two lights also serve as leading lights to guide past dangers northward and southward of Eagle Island.
8. 1855.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Building of dressed stone; solid walling; coated inside with cement; coloured white. Identified by there being two lighthouses on the islet.
12. No separate external conductor, I'sual arrangement of wrought-iron handrail to form a continuous conductor from lantern to base of tower.
13. 87 feet.
14. 220 feet.
15. 17 miles.
16. 21 miles.
17. 230° E. $\frac{1}{2}$ S. to S.W.
18. Fixed. Light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character or description of illuminating apparatus; burners adapted for using rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of the lightroom to regulate supply of air.
26. None used.
27. None.
28. 25 days.
29. 18,111. 4s., including cost of lantern and light apparatus, also heavy rock cutting to form landing benches, stair up face of rock, &c. to 1841.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 1,021*l.* (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 8*l.* 17s. 9*d.*
34. Coated with paint once every year, 41*l.* 9s. 8*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12s. 4*d.*; one at 46*l.* 3s.
36. 84*l.* total.
37. 1857, repairs, 17*l.* 6s. 3*d.*; cylinders, 5*l.* 8s.; cleaning stores, 2*l.* 4s. 4*d.* 1858, cylinders, 5*l.* 8s.; cleaning stores, 2*l.* 4s. 4*d.*
38. 1857, oil, 658 gallons; wicks, 11 gross. 1858, oil, 658 gallons; wicks, 11 gross.
39. Pale rapeseed oil. 1857, 4s. 2½*d.* per gallon. 1858, 3s. 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3s. 6*d.* per gross; 1*l.* 18s. 6*d.* total cost. 1858, 3s. 6*d.* per gross; 1*l.* 18s. 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 39*l.* 18s. 6*d.* 1858, quarter, 9*l.* 5s. Total for 1852, 159*l.* 13s. 11*d.*
44. 1852, 52*l.* 9s. 10*d.*, including boat attendance, freight of stores, &c. 1858, 63*l.* 7s., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. Circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag. No means for communicating by signal by night.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are relieved from the station as changes at other lighthouses require and allow.

166.

EAGLE ISLAND, WEST.

West Coast of Ireland, on Summit of the Islet off the Coast of the Mullet, County Mayo.

Lat. and Lon. stated in Special Return for Eagle Island, East.

3. No local authority.
4. One light; distant from the Eagle Island East Lighthouse 132 yards bearing
5. 1850.
6. Want of a light off west coast of Mayo represented by Commanders Blake and Glascock, commanders of cruisers off the west coast of Ireland, and by others.
7. A sea light being required off the Salient, north-west coast of Mayo. The two lights also serve as leading lights to guide past dangers northward and southward of Eagle Island.
8. 1855.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Building of dressed stone; solid walling; coated inside with cement; coloured white. Identified by there being two lighthouses on the islet.
12. No separate external conductor, I'sual arrangement of wrought-iron handrail to form a continuous conductor from lantern to base of tower.
13. 44 feet.
14. 220 feet.
15. 17 miles.
16. 21 miles.
17. 230° E. $\frac{1}{2}$ S. to S.W.
18. Fixed. Light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character or description of the illuminating apparatus; burners adapted for using rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of the lightroom to regulate supply of air.
26. None used.
27. None.
28. 25 days.
29. 18,111. 4s., including cost of lantern and light apparatus, also heavy rock cutting to form landing benches, stairs up face of rock, &c. to 1841.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 1,021*l.* (including cut stone blocking.)
32. Not purchased; erected by corporation.
33. 8*l.* 17s. 9*d.*
34. Coated with paint once every year, 41*l.* 9s. 8*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12s. 4*d.*; one at 46*l.* 3s.
36. 84*l.* total cost.
37. 1857, repairs, 19*l.* 17s. 1*d.*; cylinders, 5*l.* 8s.; cleaning stores, 2*l.* 4s. 4*d.* 1858, cylinders, 5*l.* 8s.; cleaning stores, 2*l.* 4s. 4*d.*
38. 1857, oil, 758 gallons; wicks, 12 gross. 1858, oil, 758 gallons; wicks, 12 gross.
39. Pale rapeseed oil. 1857, 4s. 2½*d.* per gallon. 1858, 3s. 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3s. 6*d.* per gross; 2*l.* 2s. total cost. 1858, 3s. 6*d.* per gross; 2*l.* 2s. total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 39*l.* 18s. 6*d.* 1858, quarter, 9*l.* 5s. Total for 1852, 159*l.* 13s. 11*d.*
44. 1852, 52*l.* 9s. 10*d.*, including cost of boat attendance, freight of stores, &c. 1858, 63*l.* 7s., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamps and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag. No means for communicating by signals by night.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are relieved from the station as changes at other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

167.

BROADHAVEN.

On Gubacashel Point, West Side of Entrance of Broadhaven.

Lat. 54° 16' N., Lon. 9° 53' W.

3. No separate local authority; lightkeeper transacts business of the station.
4. One light.
5. 1843.
6. Coast guard authorities.
7. As the best position for a light to guide from seaward to the entrance of Broadhaven, to guide up the haven and clear of a sunken rock on western side.
8. 1855.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. Built by workmen of the Corporation, and not by contract.
10. Harbour light.
11. Tower of dressed stone, solid wall, circular, of stone colour.
12. Usual arrangement of wrought iron handrail to form continuous conductor from lantern to bottom of tower. No separate external conductor.
13. 50 feet.
14. 87 feet.
15. 10½ miles.
16. 13 miles.
17. 253° N. by W. ½ W. to S.W. by W.
18. Fixed light; white to seaward and towards east side of haven; red as seen from west side of haven.
19. Fixed.
20. During every night from sunset to sunrise.
21. Dioptric.
22. 3rd order.
23. None found necessary or applied for.
24. Wilkins, of London.
25. Ventilating tubes, from lamp through the centre of dome, also ventilators in blocking and floor of lightroom to regulate supply of air.
26. None.
27. None.
28. 11 days.
29. 5,702*l.* 1*s.* 8*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 6 feet high; 537*l.* (including cut stone blocklog.)
32. Not purchased. Erected by the Port of Dublin Corporation.
33. 3*l.* 1*s.* 5*d.*
34. General coating of paint once in each year, 16*l.* 6*s.* 6*d.* Paints procured by contract; workmanship not by contract.
35. One keeper, 46*l.* 3*s.*
36. 310*l.* 10*s.* 2*d.*; 93*l.* Total, 403*l.* 10*s.* 2*d.*
37. 1857, cylinders, 1*l.* 4*s.*; cleaning stores, 1*l.* 3*s.* 8*d.* 1858, cylinders, 1*l.* 4*s.*; cleaning stores, 1*l.* 3*s.* 8*d.*
38. 1857, oil, 253 gallons; wicks, 2½ gross. 1858, 2½ gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, 14*s.* total cost. 1858, 14*s.* total cost.
41. No fog signal apparatus.
42. From the Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. Not lighted in 1852. For quarter, 1858, nil.
44. 1852, nil. 1858, 232*l.* 16*s.* 5*d.* (including freight of stores.)
45. None.
46. None.
47. None.
48. No complaint or representation that the light is unnecessary, or in an unsuitable position.
49. No complaint or representation as to the efficiency of the light.
50. By Committee of the Board and by the Superintendent of Light-houses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished during night since lighted.
53. At least two spare burners kept ready.
54. None in 1858.
55. No tide signals used. There has not been any application to have tide signals used at this station.
56. Signal mast and flag. No night signals.
57. One keeper. Keeper changed from the station as changes from other stations require and allow.

168.

BLACK ROCK.

West Coast of Ireland on Tidal Rock in Sligo Bay.

Lat. 54° 18' N., Lon. 8° 37' W.

3. No local authority.
4. One light. There are inner harbour lights on Oyster Island, for which special returns are given.
5. 1822.
6. Sligo Harbour Commissioners.
7. To guide from seaward to the entrance of Sligo Bay; to light the entrance channel; to mark the Black Rock, a dangerous tidal rock, and to guide to the bar channel.
8. 1835.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation. The walling of tower built by contract; the lower portion by Mr. Ham (Contractor), the upper portion by Mr. Nowell (Contractor). Lantern erected by workmen of the Corporation.
10. Harbour light.
11. Cut stone; solid masonry to above level of the high water of spring tides, over that level solid cut stone walling; identified by its position on a low tidal reef.
12. No separate external conductor.
13. 94 feet.
14. 79 feet.
15. 11½ miles.
16. 15 miles.
17. 247°. S.E. ½ E. to W.S.W. ½ S.
18. Fixed; light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None used.
27. None.
28. 10 days.
29. 9,921*l.*, including cost of lantern, apparatus, shore dwellings on Oyster Island, &c.
30. Finished.
31. Lantern sash, feet diameter, feet high; *l.*, including cost of cut stone blocklog.
32. Not purchased; erected by Corporation.
33. 2*l.* 5*s.* 10*d.*
34. Coated with paint once every year, 23*l.* 13*s.* 4*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 46*l.* 3*s.*; one helper at 36*l.* 10*s.*
36. 435*l.*, total cost.
37. 1857, cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 7*s.* 8*d.* 1858, repairs, 6*l.* 15*s.* 10*d.*; cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 7*s.* 8*d.*
38. 1857, oil, 360 gallons; wicks, 6 gross. 1858, oil, 356 gallons; wicks, 6 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 1*l.* 1*s.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 1*s.* total cost.
41. None used.
42. From Mercantile Marine Fund.
43. 1852, quarter, 24*l.* 0*s.* 9*d.* 1858, quarter, 5*l.* 5*s.* 1*d.* Total for 1852, 96*l.* 3*s.*
44. 1852, 307*l.* 19*s.* 5*d.*, including cost of freight of stores, &c. from Dublin and boat attendance. 1858, 234*l.* 19*s.* 10*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. In September, 1859.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored partly in light-house on rock, and partly in oil store on Oyster Island.
54. None in 1858.
55. No tide signals used.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keeper changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

169.

OYSTER ISLAND, SOUTH.

West Coast of Ireland, on Oyster Island in Sligo Bay.

Lat. and Lon. stated in Special Return for Oyster Island, North.

3. No local authority.
4. Two lights. South lighthouse distant from the north lighthouse 165 yards, bearing S.S.E. $\frac{1}{2}$ E.
5. 1822.
6. Sligo Harbour Commissioners.
7. To lead (the south and north lights being kept in line) in the then best channel over the bar and to the anchorage within Oyster Island.
8. 1857.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. Walling of the tower and dwellings built by contract by Mr. (now Sir John) Benson. Lantern erected by Port of Dublin Corporation.
10. Harbour light.
11. Chiefly cut stone; solid walling; tower of circular form, coloured white externally.
12. No separate external conductor. Usual arrangement of wrought-iron handrail of tower.
13. 43 feet.
14. 49 feet.
15. 8 miles.
16. 18 miles.
17. $1\frac{1}{4}$ N.W. by N. to N.N.W.
18. Fixed. Light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company. Frame by workmen of the Corporation.
25. Usual arrangement as the other catoptric lights.
26. None used; none applied for.
27. None.
28. 13 days.
29. 4,600*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, feet diameter, feet high, *l.* including cost of cut stone blocking.
32. Not purchased; erected by Corporation.
33. *2l. 8s. 10d.*
34. Coated with paint once every year, *23l. 13s. 4d.* Paints procured by contract; workmanship not by contract.
35. One keeper at *46*l.* 3s.*
36. *210*l.* total cost.*
37. 1857, cylinders, *1*l.* 16s.*; cleaning stores, *1*l.* 1s. 6d.* 1858, repairs, *1*l.* 17s. 2d.*; cylinders, *1*l.* 16s.*; cleaning stores, *1*l.* 1s. 8d.*
38. 1857, oil, 140 gallons; wicks, 4 gross. 1858, oil, 133 gallons; wicks, 4 gross.
39. Pale rapeseed oil. 1857, *4s. 2½*d.** per gallon. 1858, *3s. 5d.* per gallon.
40. Argand cotton wicks. 1857, *3s. 6d.* per gross; *14s.* total cost. 1858, *3s. 6d.* per gross; *14s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, *9*l.* 15s. 2d.* 1858, quarter, *5*l.* 4s. 7d.* Total, 1852, *39*l.* 0s. 8d.*
44. 1852, *307*l.* 19s. 5d.*, including 1858, *234*l.* 19s. 10d.*
45. None.
46. None.
47. None.
48. No representation made as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. In September, 1859.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining the lighthouse.
54. None in 1858.
55. No tide signals used; none applied for.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

170.

OYSTER ISLAND, NORTH.

West Coast of Ireland, on Oyster Island in Sligo Bay.

Lat. 54° 18' 5" N., Lon. 8° 34' 4" W.

3. No local authority.
4. Two lights. North lighthouse distant from the south lighthouse 165 yards, bearing N.N.W. $\frac{1}{2}$ W.
5. 1822.
6. Sligo Harbour Commissioners.
7. To lead (the north and south lights being kept in line) in the then best channel over the bar and to the anchorage within Oyster Island.
8. 1857.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. Walling of the tower and dwellings built by contract by Mr. (now Sir John) Benson. Lantern erected by Port of Dublin Corporation.
10. Harbour light.
11. Chiefly cut stone; solid walling; tower of circular form, coloured white externally.
12. No separate external conductor. Usual arrangement of wrought-iron handrail of tower.
13. 43 feet.
14. 40 feet.
15. $7\frac{1}{2}$ miles.
16. 12 miles.
17. 22° N. by W. $\frac{1}{2}$ W. to N.W. $\frac{1}{2}$ N.
18. Fixed. Light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company. Frame by workmen of the Corporation.
25. Usual arrangement as the other catoptric lighthouses.
26. None used; none applied for.
27. None.
28. 13 days.
29. 4,600*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, feet diameter, feet high.
32. Not purchased; erected by Corporation.
33. *2*l.* 8s. 10d.*
34. Coated with paint once every year, *23l. 13s. 4d.* Paints procured by contract; workmanship not by contract.
35. One keeper at *46*l.* 3s.*
36. *210*l.* total cost.*
37. 1857, cylinders, *1*l.* 16s.*; cleaning stores, *1*l.* 1s. 6d.* 1858, repairs, *4*l.* 8s. 3d.*; cylinders, *1*l.* 16s.*; cleaning stores, *1*l.* 1s. 8d.*
38. 1857, oil, 145 gallons; wicks, 4 gross. 1858, oil, 140 gallons; wicks, 4 gross.
39. Pale rapeseed oil. 1857, *4s. 2½*d.** per gallon. 1858, *3s. 5d.* per gallon.
40. Argand cotton wick. 1857, *3s. 6d.* per gross; *14s.* total cost. 1858, *3s. 6d.* per gross; *14s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, *9*l.* 15s. 2d.* 1858, quarter, *5*l.* 4s. 7d.* Total, 1852, *39*l.* 0s. 8d.*
44. 1852, *307*l.* 19s. 5d.*, including freight of stores, &c. from Dublin. 1858, *234*l.* 19s. 10d.*, ditto.
45. None.
46. None.
47. None.
48. No representation made as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. In September, 1859.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining lighthouse.
54. None in 1858.
55. No tide signals used; none applied for.
56. Signal mast and flag. No night signals used.
57. One keeper; changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

171.

KILLYBEGS.

West Coast of Ireland, on St. John's Point,
North Side of Donegal Bay, South Side
of Entrance to Killybegs Harbour.

Lat. 54° 34' 8" N., Lon. 8° 27' 33" W.

3. No local authority.
4. One light.
5. 1825.
6. Merchants and traders of Killybegs.
7. To guide from entrance of Donegal Bay, and also the northern side of the bay, to mark St. John's Point, and to light Killybegs Harbour from its entrance to Rotten Island.
8. 1831.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Harbour light.
11. Chiefly cut stone; tower circular form; painted white outside; readily identified by its position at the extremity of the promontory of St. John's Point.
12. No separate external conductor. Usual arrangement of wrought-iron handrail in tower to form a continuous conductor from lantern to base of lighthouse.
13. 47 feet.
14. 98 feet.
15. 11½ miles.
16. 15 miles.
17. 31° N.E. to E, ¼ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric. This is one of the stations at which it is intended to substitute dioptric for catoptric apparatus.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapessed oil. It has been suggested by the Engineer of the Corporation that dioptric apparatus should be substituted for catoptric at this as well as at some others, where considerable portions of the circle is lighted.
24. Reflectors and lamps from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 12 days.
29. 9,606*l.* 7*s.* 4*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 19 feet diameter, 8 feet high. 1,025*l.* (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 12*l.* 11*s.* 8*d.* Not by contract.
34. Coated with paint once every year, 38*l.* 1*s.* 9*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
36. 1,080*l.* total cost.
37. 1857, repairs, 26*l.* 16*s.* 8*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.* 1858, cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.*
38. 1857, oil, 840 gallons; wicks, 18 gross. 1858, oil, 835 gallons; wicks, 13 gross.
39. Pale rapessed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 5*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 5*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 9*l.* 5*s.* 3*d.* 1858, quarter, 15*l.* 11*d.* Total for 1852, 37*l.* 1*s.*
44. 1852, 222*l.* 5*s.* 2*d.*, including cost of freight of stores from Dublin. 1858, 344*l.* 16*s.* 7*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation or complaint as to the position of the light.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store near to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other lighthouses require and allow.

172.

KILLYBEGS HARBOUR.

West Coast of Ireland, on Rotten Island,
South Side of Harbour Channel.

Lat. 54° 36' 51" N., Lon. 8° 26' 23" W.

3. No local authority.
4. One light.
5. 1832.
6. Application for an inner harbour light, made by Mr. Drury, an officer of coast guard, and by others. Site selected by Port of Dublin Corporation.
7. To light the passage from seaward, and the inner harbour channel, the harbour rocks, and the anchorage.
8. 1838.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Harbour light.
11. Chiefly cut stone; solid walling; tower of circular form; painted white on the outside.
12. No separate external conductor. Wrought-iron handrail arranged to form continuous conductor from lantern to base of tower.
13. 47 feet.
14. 66 feet.
15. 9½ miles.
16. 13 miles.
17. 180° S.W. ¼ S. to N.E. ¼ N.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapessed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. None.
29. 8,867*l.* 15*s.* 11*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 950*l.* (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 12*l.* 11*s.* 8*d.*, repair chiefly of shore wall and of outbuildings: Not by contract.
34. Coated with paint once every year, 38*l.* 1*s.* 9*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 245*l.* total cost.
37. 1857, repairs, 9*l.* 9*s.* 9*d.*; cylinders, 2*l.* 2*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, cylinders, 2*l.* 2*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 220 gallons; wicks, 5 gross. 1858, oil, 214 gallons; wicks, 5 gross.
39. Pale rapessed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 9*l.* 6*s.* 8*d.* 1858, quarter, 9*l.* Total for 1852, 37*l.* 6*s.* 8*d.*
44. 1852, 269*l.* 3*s.* 7*d.*, including boat attendance, freight of stores from Dublin, &c. 1858, 195*l.* 1*s.* 6*d.* ditto.
45. None.
46. None.
47. None.
48. No complaint or representation as to the position of the light.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. None in 1858.
55. No tide signals used. No application made to have them used.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

173.

RATHLIN O'BIRNE ISLAND.

On Point of the Island off Teelin Head,
County of Donegal, North-west Coast of
Ireland.

Lat. 54° 39' 47" N., Lon. 8° 49' 52" W.

3. The Port of Dublin Corporation have not any formally appointed local agents paid as such.
4. One light.
5. 1841.
6. Memorial from shipowners at Sligo.
7. To mark the south-western prominent point of the county of Donegal.
8. 1856.
9. Tower and dwellings, &c. built by contract from plans and specification, and under supervision of George Halpin, Engineer of the Port of Dublin Corporation. Contractor, Mr. Jas. Creden, for buildings, roads, enclosures, &c.
10. Sea light (secondary class).
11. Tower of stone, solid masonry without separate inner wall, coated inside with cement; walls of dwellings of stone; partition of breeze duct with metal.
12. Usual arrangement of connecting iron handrail with metal enclosure plate of lightroom. No separate exterior conductor.
13. 65 feet.
14. 116 feet.
15. 12 miles.
16. 16 sea miles.
17. (360°). Lighted all round the circle, coloured red to sound or landward.
18. Flashing. Light of natural colour or appearance seaward, coloured red towards mainland.
19. Bright flash every 20 seconds.
20. During whole night, from sunset to sunrise.
21. Dioptric, having catadioptric zones above and below the polygonal lenses.
22. 2nd order, one concentric wick burner.
23. No alteration in character of illuminating apparatus since first lighted; slight alteration in arrangement for colouring light to landward, at suggestion of the Engineer of the Corporation.
24. Wilkins, of London.
25. Central tube through dome of lantern, subsidiary ventilator in blocking over floor of lightroom.
26. None.
27. None.
28. 38 days.
29. 17,140l. 0s. 7d., including cost of lantern, light apparatus, roadways, &c.
30. All necessary buildings completed.
31. Lantern sash, 13 feet diameter, 10 feet high. 817l. (including cut stone blocking.)
32. Was not purchased, was built and paid for by the Port of Dublin Corporation.
33. Lighted only two years.
34. General coating of paint once in each year, 41l. 0s. 6d. Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64l. 12s. 4d.; one at 46l. 3s.
36. 1,473l. 13s. 5d.; 180l. 18s. Total, 1,653l. 17s. 5d.
37. 1857, repairs, 29l. 9s. 8d.; cylinders, 3l. 10s.; cleaning stores, 2l. 5s. 4d. 1858, cylinders, 3l. 10s.; cleaning stores, 2l. 5s. 4d.
38. 1857, oil, 255 gallons. 1858, oil, 273 gallons.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Cotton concentric wick. 1857, 1l. 17s. 6d. total cost. 1858, 4l. 17s. 6d. total cost.
41. None at this station.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. Not lighted until 1856. 1858, quarter, 13l. 2s.
44. 1858, 580l. 5s. 7d. (including boat attendance and freight of stores.)
45. None.
46. None.
47. None.
48. No complaints or representations made.
49. No complaints or representations as to efficiency of the light since lighted.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Light not known to have been extinguished during night since lighted.
53. At least two spare lamp burners kept in readiness. Oil stored in oil store adjoining principal keeper's dwelling, close to the lightroom.
54. Barometer and thermometer.
55. No tide signals used; not requisite in this outer position, remote from any harbour or tidal navigation.
56. No signals for night. By day boat, if required, summoned by flag; this is rarely necessary, owing to closeness of island to mainland; regular boat attendance and frequent passing of row boats and hookers engaged in fishing.
57. Keepers are relieved from watch in lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other stations require and allow.

174.

TORY ISLAND.

North Coast of Ireland, on the North-west
Point of Tory Island.

Lat. 55° 16' 26" N., Long. 8° 13' W.

1. No local agent.
4. One light.
5. 1823.
6. Shipowners and Harbour Commissioners of Sligo.
7. As a prominent point of departure and landfall for vessels crossing the Atlantic; as a good position for a sea light, and turning point in navigation of the north-west coast of Ireland, and of the Sound between the island and the mainland.
8. 1839.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cutstone; solid walling; coated with inside cement. The tower is of circular form, coloured white.
12. No separate external conductor. The usual arrangement of wrought-iron handrail to form a continuous conductor from lantern to base of tower.
13. 87 feet.
14. 125 feet.
15. 12½ miles.
16. 17 miles.
17. 32° S.E. by S. to S.E. ½ E.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric. Dioptric apparatus has been prepared for this lighthouse, and will be erected during the present year.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus; burners adapted for use of rapeseed oil. Dioptric apparatus nearly ready; about to be substituted for the catoptric apparatus.
24. Reflectors from the Sahu Plate Company.
25. Ventilation through dome. There are also ventilators in the blocking and floor of lightroom to regulate the supply of air.
26. None used.
27. None.
28. 13 days.
29. 16,750l. 0s. 7d., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 1,150l. (including cut stone blocking.)
32. Not purchased; erected by Corporation.
33. 3l. 2s. 4d. Not by contract.
34. Coated with paint once every year, 50l. 10s. 3d. Paints procured by contract; workmanship not by contract.
35. Two keepers; one at 64l. 12s. 4d., one at 46l. 3s.
36. 1,450l. total cost.
37. 1857, repairs, 37l. 7s. 10d.; cylinders, 7l. 4s.; cleaning stores, 3l. 7s. 1858, cylinders, 7l. 4s.; cleaning stores, 3l. 7s.
38. 1857, oil, 1,178 gallons; wicks, 16 gross. 1858, oil, 1,173 gallons; wicks, 16 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Argand cotton wick. 1857, 3s. 6d. per gross; 2l. 16s. total cost. 1858, 3s. 6d. per gross; 2l. 16s. total cost.
41. None.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 81l. 13s. 9d. 1858, quarter, 40l. 1s. 1d. Total for 1852, 826l. 14s. 11d.
44. 1852, 543l. 8s. 1d., including boat attendance, freight of stores, &c. from Dublin. 1858, 478l. 18s., ditto.
45. None.
46. None.
47. None.
48. No complaint or representation as to the position of the light.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for.
56. Signal mast and flag. No night signals.
57. Keeper relieved in the lightroom at 12 o'clock, midnight. Keepers changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

175.

LOUGHSWILLY.

North Coast of Ireland, on Fannet Point,
West Side of Entrance of the Lough.

Lat. 55° 16' 33" N., Lon. 7° 38' W.

3. No local authority.
4. One light.
5. 1812.
6. Collector of Customs at Derry and others.
7. To guide from seaward to Loughswilly, and to light the entrance and channel of the Lough.
8. 1816.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation. Built under his direction by the workmen of the Corporation, not by contract.
10. Classed as sea light.
11. Cut stone; solid walling; tower of circular form, coloured white; readily identified from its position on Fannet Point.
No separate external conductor. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to base of tower.
12. 26 feet.
13. 90 feet.
15. 10½ miles.
16. 15 miles.
17. 157° N.W. by W. ½ W. to S. ½ W.
18. Fixed. Light coloured red to seaward; towards the Lough of the natural a pearance, white.
19. Fixed.
20. Durioq every night, from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the floor and blocking of lightroom to regulate supply of air.
26. None used.
27. None.
28. None.
29. 5,75*l.* 1*s.* 10*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, feet diameter, feet high; *l.*
32. Not purchased; erected by Corporation.
33. 8*l.* 14*s.* 2*d.*
34. Coated with paint once every year, 20*l.* 15*s.* 11*d.* Paint procured by contract; workmanship not by contract.
35. One keeper at 6*l.* 12*s.* 4*d.*
36. 510*l.*
37. 1857, cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, repairs, 3*l.* 7*s.* 8*d.*; cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 370 gallons; wicks, 7 gross. 1858, oil, 402 gallons; wicks, 7 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 1*l.* 4*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 4*s.* 6*d.* total cost.
41. None.
42. From Mercantile Marine Fmnd. Revenue collected and paid as per Special Return No. 1.
43. 1852, quarter, 8*l.* 12*s.* 2*d.* 1858, quarter, 4*l.* 17*s.* 5*d.* Total for 1852, 338*l.* 8*s.* 9*d.*
44. 1852, 890*l.* 19*s.* 6*d.*, including cost of freight of stores, &c. from Dublin. 1858, 258*l.* 4*s.* 6*d.*, ditto.
45. None.
46. None.
47. None.
48. No complaints or representation as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made to have them used.
56. Signal mast and flag. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

176.

INISTRAHULL.

North Coast of Ireland, on small Island off
North Coast, County Donegal.

Lat. 55° 25' 55" N., Lon. 7° 13' 37" W.

3. No local authority.
4. Only one light.
5. 1812.
6. At suggestion of Port of Dublin Corporation.
7. A sea light being requisite off that part of the north coast of Ireland previously unlighted; the evident usefulness of a light on the most northern position of Donegal, guiding past it with good effect.
8. 1812.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone; solid walls; tower circular; coloured white; readily identified by its position on summit of the island.
12. No separate external conductor. Usual arrangement of wrought-iron handrail forming a continuous conductor from lantern to base of tower.
13. 45 feet.
14. 181 feet.
15. 15½ miles.
16. 19 miles.
17. 366°*F.* lighted all round.
18. Revolving. Light of natural appearance, white.
19. Bright light or flash appearing every two and a half minutes, the light gradually increasing and decreasing in strength.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in general character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company (Boulton and Watt.)
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 23 days.
29. 10,850*l.* 8*s.* 4*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 1,080*l.* (including cut stone blocking, &c.)
32. Not purchased, erected by the Corporation.
*1*l.* 12*s.* 5*d.**
34. Coated with paint once every year, 38*l.* 7*s.* 9*d.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 6*l.* 12*s.* 4*d.*; one at 4*l.* 3*s.*
36. Light apparatus, 945*l.*; machine, 250*l.*; fitting, &c., 100*l.* Total, 1,295*l.*
37. 1857, cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.* 1858, repairs, 30*l.* 7*s.* 10*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 5*s.* 4*d.*
38. 1857, oil, 800 gallons; wicks, 12 gross. 1858, oil, 801 gallons; wicks, 12 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 2*s.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 2*s.* total cost.
41. None.
42. From Mercantile Marine Fmnd. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 160*l.* 4*s.* 1858, quarter, 99*l.* 5*s.* 6*d.* Total for 1852, 640*l.* 16*s.* 1*d.*
44. 1852, 629*l.* 4*s.* 1*d.*, including boat attendance and freight of oil and stores from Dublin. 1858, 860*l.* 8*s.* 4*d.* ditto.
45. None.
46. None.
47. None.
48. No representation or complaint.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store adjoining lighthouse.
54. Barometer and thermometer.
55. Tide signals not used; not applied for.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in lightroom at 12 o'clock, midnight. Keepers are relieved from the station as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

177.

INISHOWEN, WEST.

North Coast of Ireland, on Donagree Point, Inishowen Head.

Lat. and Lon. as stated in Special Return for Inishowen, East.

3. No local authority.
4. One light in western tower, distant from the outer or eastern lighthouse 153 yards, bearing
5. 1832.
6. Chamber of Commerce, Derry.
7. As guiding from seaward to Lough Foyle, lighting its entrance channel.
8. 1837.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation; the walling built by contract by Mr. Pettigrew, of Dublin; the lantern erected by workmen of the Corporation.
10. Harbour light.
11. Material, cut stone; coated internally with cement and mortar; tower circular, coloured white; the two towers leading lights.
12. No separate external conductor. Usual arrangement of wrought-iron handrail of tower to form continuous conductor from lantern to base of tower.
13. 49 feet.
14. 67 feet.
15. 9½ miles.
16. 13 miles.
17. 60° N.E. by E. ½ E. to S.E. by E. ½ E.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night: from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in general character of the light apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company; wrought-iron frame, &c. by workmen of the Corporation.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 29 days.
29. 87*½* 1*½*s. 3*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 18 feet diameter, 8 feet high. 75*0*l. (including cut stone blocking.)
32. Not purchased, erected by Corporation.
33. 1*6*l. 7*s.* 4*d.* This outlay chiefly on sea or shore defences of the premises.
34. Coated with paint once every year, 34*l.* 4*s.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 1851, 25*l.* Total, 21*0*l.
37. 1857, cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 5*s.* 8*d.* 1858, repairs, 4*l.* 13*s.* 11*d.*; cylinders, 1*l.* 16*s.*; cleaning stores, 1*l.* 5*s.* 8*d.*
38. 1857, oil, 170 gallons. 1858, oil, 172 gallons.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross. 1858, 3*s.* 6*d.* per gross.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 34*l.* 6*s.* 1858, quarter, 23*l.* 5*s.* 6*d.* Total for 1852, 137*l.* 4*s.* 3*d.*
44. 1852, 287*l.* 11*s.* 3*d.*, including cost of freight of stores, &c. 1858, 198*l.* 4*s.* 4*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burners kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tidal signals used; none have been applied for.
56. Signal mast and flag. No night signals.
57. One keeper at each of the two houses. Keeper relieved from the station as changes from other lighthouses require and allow.

178.

INISHOWEN, EAST.

North Coast of Ireland, on Donagree outer Point, Inishowen Head.

Lat. 53° 13' 88" N., Lon. 6° 53' 38" W.

3. No local authority.
4. Two lights vertical in same tower, the lower light to distinguish the east from the west lighthouse. East lighthouse distant from the west lighthouse 153 yards, bearing E. The east and west lights kept in line lead clear of the "Tuns Bank."
5. 1832.
6. Chamber of Commerce, Derry.
7. As guiding from seaward to Lough Foyle, lighting its entrance channel.
8. 1837.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation; the walling built by contract by Mr. Pettigrew, of Dublin; the lantern erected by workmen of the Corporation.
10. Harbour light.
11. Material cut stone; coated internally with cement and mortar. Tower circular, coloured white. The two towers leading lights.
12. No separate external conductor. Usual arrangement of wrought-iron handrail of tower to form continuous conductor from lantern to base of tower.
13. 49 feet.
14. 67 feet.
15. 9½ miles.
16. 13 miles.
17. 219° N.E. ½ N. to W. by S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in general character of the light apparatus; burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company. Wrought-iron frame, &c. by workmen of the Corporation.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. None used.
27. None.
28. 29 days.
29. 9*10*l. 14*s.* 2*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, 18 feet diameter, 8 feet high. 75*0*l. (including cut stone blocking.)
32. Not purchased, erected by Corporation.
33. 1*6*l. 7*s.* 4*d.* This outlay chiefly on sea or shore defences of the premises.
34. Coated with paint once every year, 34*l.* 4*s.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 515*l.*; 50*l.* Total, 565*l.*
37. 1857, cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 6*s.* 7*d.* 1858, repairs, 7*l.* 12*s.* 11*d.*; cylinders, 3*l.* 12*s.*; cleaning stores, 1*l.* 6*s.* 7*d.*
38. 1857, oil, 402 gallons; wicks, 7 gross. 1858, oil, 404 gallons; wicks, 7 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wick. 1857, 3*s.* 6*d.* per gross; 1*l.* 4*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 4*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 34*l.* 6*s.* 1858, quarter, 23*l.* 5*s.* 6*d.* Total for 1852, 137*l.* 4*s.* 3*d.*
44. 1852, 287*l.* 11*s.* 3*d.*, including cost of freight of stores, &c. 1858, 198*l.* 4*s.* 4*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none have been applied for.
56. Signal mast and flag. No night signals.
57. One keeper at each of the two houses. Keepers are relieved from the station as changes at other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

179.

RATHLIN ISLAND, UPPER.
North Coast of Ireland, on North-east
Point of Rathlin Island.

Lat. 55° 18' 10" N., Lon. 6° 16' 45" W.

3. No local authority.
4. Two lights. Lower Light is outside and adjoining base of tower of the Upper Light.
5. 1827.
6. Commissioners of the Port of Londonderry.
7. A sea light being requisite on the western side of the entrance of the north channel; lighting also a prominent turning point in the navigation of the north-east coast of Ireland.
8. 1856.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone; solid walling; tower of circular form, with a red belt; readily recognized by its position on the salient angle of the island, and by the lower light at base of the upper tower.
12. No separate external conductor. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to base of tower.
13. 88 feet.
14. 243 feet.
15. 17½ miles.
16. 22 miles.
17. 177 N.W. ½ N. to S.W. by S., and S.W. by W. ½ W. to W. ½ S.
18. Upper light is intermittent, showing a fixed white light during 50 seconds, and eclipsed during 10 seconds. The arrangement to produce eclipses of this light designed by the Engineer of the Port of Dublin Corporation.
19. Light appearing during 50 seconds, is suddenly eclipsed and obscured during 10 seconds, then reappears, and so on in the same order of succession.
20. During every night, from sunset to sunrise.
21. Dioptric.
22. 1st order.
23. No alteration in the description or character of the illuminating apparatus since lighted.
24. Dioptric apparatus made by Messrs. Chance, Brothers, of Birmingham. The machine, similar in arrangement to the machine of the intermittent light of St. John's Point and Minehead, was constructed by McMaster, of Dublin.
25. Ventilating tube continued from lamp through dome of lantern. Upper portion of tube not added until 1860.
26. None used.
27. None.
28. 15 days.
29. 7,649*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, 13 feet diameter, 10 feet high. 904*l.*, including cut stone blocking.
32. Not purchased; erected by Corporation.
33. 1*l.* 15*s.* 3*d.*
34. Coated with paint once every year, 22*l.* Paints procured by contract; workmanship not by contract.
35. Three keepers; one at 64*l.* 15*s.* 3*d.*, two at 46*l.* 3*s.* each, of which half the cost chargeable to each light, or 78*l.* 9*s.* 2*d.* to upper light.
36. Dioptric apparatus, 1,218*l.* 14*s.*; machine, 132*l.* 10*s.* 2*d.*; 191*l.* 17*s.* Total, 1,483*l.* 14*s.* 2*d.*
37. 1857, cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 6*s.* 10*d.* 1858, cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 6*s.* 10*d.*
38. 1857, oil, 513 gallons; wicks, 34 gross. 1858, oil, 445 gallons; wicks, 34 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, 2*l.* 5*s.* total cost. 1858, 2*l.* 5*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, not lighted. 1858, quarter, 120*l.* 19*s.* 8*d.*, total quarter's income for upper and lower lights, for which light dues are charged as for one light only.
44. 1852, not lighted. 1858, 581*l.* 14*s.* 11*d.*, including boat attendance, freight of stores, &c. from Dublin. Total expenditure for upper and lower lights.
45. None.
46. None.
47. None.
48. No complaint or representation as to the position of the light.
49. No complaint or representation as to the efficiency of the light.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. At least two spare lamp burners kept ready. Oil stored in oil store near to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made to have them adopted.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other lighthouses require and allow.

180.

RATHLIN ISLAND, LOWER.

North Coast of Ireland, on North-east
Point of Rathlin Island.

Lat. and Lon. as per statement in Special Return for Upper Lighthouse.

3. No local authority.
4. Two lights. Tower of the Upper Lighthouse adjoins base of lantern of Lower Light.
5. 1827.
6. Commissioners of the Port of Londonderry.
7. A sea light being requisite on the western side of the entrance of the north channel, lighting also a prominent turning point in the navigation of the north-east coast of Ireland. The second or lower light suggested by Trinity Board to form a certain means of identification of the position.
8. 1856.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation and Superintendent of Lighthouses, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Cut stone, base and floor. The lightroom blocking of cast iron. The prominent position of the two lights (upper and lower) give means of identification.
12. No separate external conductor. The lower lantern forms a continuous conductor from vane to base of lighthouse.
13. 88 feet.
14. 243 feet.
15. 17½ miles.
16. 20 miles.
17. 118 N.W. by N. to S.S.W. ½ W.
18. Lower light fixed. The light of the natural appearance, white.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Dioptric.
22. 1st order.
23. No alteration in the description or character of the illuminating apparatus since lighted.
24. Dioptric apparatus made by Messrs. Chance, Brothers, of Birmingham.
25. Ventilating tube continued from lamp through dome of lantern. Upper portion of tube not added until 1860.
26. None used.
27. None.
28. 15 days.
29. 7,600*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, 13 feet diameter, 10 feet high. 887*l.*, including cast iron blocking and cut stone base.
32. Not purchased; erected by Corporation.
33. 1*l.* 15*s.* 3*d.*
34. Coated with paint once every year, 13*l.* 1*s.* 6*d.* Paints procured by contract; workmanship not by contract.
35. Three keepers; one at 64*l.* 15*s.* 3*d.*, two at 46*l.* 3*s.* each, of which half the cost chargeable to each light, or 78*l.* 9*s.* 2*d.* for each.
36. Dioptric apparatus, 1,017*l.* 16*s.*; 85*l.* Total cost, 1,102*l.* 16*s.*
37. 1857, cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 6*s.* 10*d.* 1858, cylinders, 4*l.* 4*s.*; cleaning stores, 2*l.* 6*s.* 10*d.*
38. 1857, oil, 513 gallons; wicks, 34 gross. 1858, oil, 445 gallons; wicks, 34 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Cotton concentric wick. 1857, 2*l.* 5*s.* total cost. 1858, 2*l.* 5*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, not lighted. 1858, income included in amount stated in Special Return for Upper Lighthouse.
44. 1852, not lighted. 1858, total expenditure for year 1858, for Upper and Lower Lights, stated in Special Return for Upper Light.
45. None.
46. None.
47. None.
48. No complaint or representation as to the position of the light.
49. No complaint or representation as to the efficiency of the light.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. At least two spare lamp burners kept ready. Oil stored in oil store near to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made to have them adopted.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

181.

MAIDEN'S ROCKS, NORTH.

East Coast of Ireland, on the Northern (or Western) Maiden's Rock, off East Coast, County Antrim.

Lat. 54° 55' 47" N., Lon. 5° 45' W.

3. No local authority.
4. One light, distant from light on South Maiden's Rock 824 yards, bearing S.E. by E.
5. 1817.
6. Admiral Hollowell in 1817; merchants of Larne in 1818; second light at suggestion of the Corporation.
7. The fitness of the position for a sea light, placed on a rock $4\frac{1}{2}$ miles distant from the east coast of Antrim; it marks the western side of the cluster of rocks; guides along the western side of St. George's Channel with a good offing from the coast.
8. 1828.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built under his supervision by the workmen of the Corporation, not by contract.
10. Sea light.
11. Material, cut stone; solid wall, coated inside with cement; tower circular, coloured white, marked with a broad red belt.
12. No external conductor. Usual arrangement of wrought-iron handrail of tower, forming a conductor from lantern to base of tower.
13. 68 feet.
14. 84 feet.
15. $10\frac{1}{2}$ miles.
16. 14 miles.
17. 360°. Lighted all around.
18. Fixed. The light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration beyond alteration of the burners to suit them for use with rapeseed oil, made at suggestion of the engineer of the Corporation. It has been the intention of the Corporation to change the apparatus to dioptric at this and several of the other catoptric lights of the 1st order.
24. Reflectors from Suho Plate Company.
25. Ventilation through dome. There are also ventilators in the floor and blocking of lightroom to regulate supply of air.
26. None used.
28. 14 days.
29. 18,56*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 3 feet high. 1,115*l.* (approximate) including stone blocking.
32. Not purchased; erected by Port of Dublin Corporation.
33. 13*l.* 7*s.*
34. General coat of painting once in each year, 53*l.* 6*s.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 6*l.* 12*s.* 4*d.*, one at 46*l.* 3*s.*
36. 1,134*l.* (approximate).
37. 1857, repairs, 25*l.* 8*s.* 2*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 9*s.* 4*d.*. 1858, repairs, 36*l.* 7*s.* 1*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 9*s.* 4*d.*. Apparatus did not require repairs in 1856 or 1859.
38. 1857, oil, 861 gallons; wicks, 14 gross. 1858, oil, 868 gallons; wicks, 14 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 9*s.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 9*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected as per statement in Special Return No. 1.
43. 1852, quarter, 418*l.* 14*s.* 11*d.*. 1858, quarter, 144*l.* 2*s.* 10*d.*. Total for 1852, 1,674*l.* 19*s.* 9*d.*
44. 1852, 617*l.* 13*s.* 10*d.*, including freight of stores, attendance of hooker, &c. 1858, 563*l.* 0*s.* 5*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None; on the contrary, a general admission as to the position being very suitable.
50. None.
51. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
52. On circuit of inspection in 1857; ditto, 1858.
53. Not known to have been extinguished.
54. At least one lamp and burner always kept ready. From the strength and simplicity of the lamps and burners used they are not liable to injury more than gradual wear. The oil is stored in the oil store close to the lighthouse.
55. Barometer and thermometer.
56. No tide signals used; none applied for; none requisite, owing to the distance from any tidal navigation of harbour.
57. Signal mast and flag. No means of communicating by signals at night.
58. Keeper on watch in lightroom relieved at 12 o'clock, midnight. Keepers are relieved from the station as removals from other station allow.

182.

MAIDEN'S ROCK, SOUTH.

East Coast of Ireland, on Rock off East Coast of County Antrim.

Lat. 54° 55' 49" N., Lon. 5° 44' 20" W.

3. No local authority.
4. One light, distant from the light on the North Maiden's Rock 824 yards, bearing N.W. by W.
5. 1817.
6. Admiral Hollowell in 1817; merchants of Larne in 1818; second light at suggestion of Corporation.
7. Its obvious fitness as an excellent position for a sea light, placed on a rock $4\frac{1}{2}$ distant from the mainland; it marks the cluster of rocks named the "Maiden's Rocks;" guides through the western side of St. George's Channel with good offing from the east coast of Antrim.
8. 1828.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his supervision by the workmen of the Corporation, and not by contract.
10. Sea light.
11. Material, cut stone; solid wall, coated inside with cement; tower circular, coloured white, marked with a 'broad red belt.'
12. No external conductor. Usual arrangement of wrought-iron handrail of tower, forming a conductor from lantern to base of tower.
13. 76 feet.
14. 94 feet.
15. 11 miles.
16. 15 miles.
17. 360°. Lighted all around.
18. Fixed. The light of the natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration beyond alteration of the burners to suit them for use with rapeseed oil, made at suggestion of the engineer of the Corporation. It has been the intention of the Corporation to change the apparatus to dioptric at this and several of the catoptric lights of the 1st order.
24. Reflectors from Suho Plate Company.
25. Ventilation through dome. There are also ventilators in the floor and blocking of lightroom to regulate supply of air.
26. None used.
27. None.
28. 16 days.
29. 18,526*l.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 3 feet high. 1,115*l.* (approximate) including stone blocking.
32. Not purchased erected; by Port of Dublin Corporation.
33. 13*l.* 7*s.*
34. General coating of paint once in each year, 53*l.* 6*s.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 6*l.* 12*s.* 4*d.*, one at 46*l.* 3*s.*
36. 1,134*l.* (approximate).
37. 1857, repairs, 25*l.* 16*s.* 5*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 9*s.* 4*d.*. 1858, repairs, 33*l.* 7*s.* 5*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 9*s.* 4*d.*
38. 1857, oil, 1,072 gallons; wicks, 15 gross. 1858, oil, 1,075 gallons; wicks, 15 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 12*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 12*s.* 6*d.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 418*l.* 14*s.* 11*d.*. 1858, quarter, 144*l.* 2*s.* 10*d.*. Total for 1852, 1,674*l.* 19*s.* 9*d.*
44. 1852, 617*l.* 13*s.* 10*d.*, including freight of stores, attendance of hooker, &c. 1858, 563*l.* 0*s.* 5*d.*, ditto.
45. None.
46. None.
47. None.
48. None; on the contrary, a general admission as to the position being very suitable.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. At least one lamp and burner always kept ready. From the strength and simplicity of the lamps and burners used they are not liable to injury more than gradual wear. The oil is stored in the oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; none applied for; none requisite, owing to the distance from any tidal harbour or navigation.
56. Signal mast and flag. No means of communicating by signals at night.
57. Keeper on watch in lightroom relieved at 12 o'clock, midnight. Keepers are changed from the station as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

183.

LARNE LOUGH.

East Coast of Ireland, on Farres's Point, on East Side of Entrance to Harbour.

Lat. 54° 51' N., Long. 5° 48' W.

3. No local authority.
4. One light.
5. 1831.
6. Merchants of Larne, and others.
7. As guiding from seaward to Larne Harbour, and through its entrance passage.
8. 1839.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation, and built by the workmen of the Corporation, not by contract.
10. Harbour light.
11. Cut stone; solid wall; coated inside with cement. Tower circular, painted white.
12. Usual arrangement of wrought-iron handrail, forming continuous conductor from lantern to base of tower.
13. 50 feet.
14. 42 feet.
15. 7 miles.
16. 12 miles.
17. 260° E. by N. $\frac{1}{2}$ N. to S. $\frac{1}{2}$ E.
18. Fixed.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the description or character of the illuminating apparatus; burners adapted for use of rapeseed oil.
24. Parabolic reflectors, by the Soho Plate Company. Wrought-iron frame by the workmen of the Corporation.
25. Through dome. There are also ventilators in the blocking and floor of lantern to regulate the supply of air.
26. None used.
27. None.
28. 17 days.
29. 7,35*l.* 18*s.* 3*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 547*l.* (including cut stone blocking).
32. Not purchased; erected by Corporation.
33. 3*l.*
34. Coated with paint once every year, 26*l.* 15*s.* 5*d.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 347*l.*; 75*l.* Total, 422*l.*
37. 1857, repairs, 11*l.* 10*s.* 4*d.*; cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 3*s.* 8*d.* 1858, repairs, 13*l.* 12*s.* 5*d.* (none in 1856 or 1859); cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 3*s.* 8*d.*
38. 1857, oil, 337 gallons; wicks, 6 gross. 1858, 349 gallons; wicks, 6 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 1*l.* 1*s.* total cost. 1858, 3*s.* 6*d.* per gross; 1*l.* 1*s.* total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1854, quarter, 11*l.* 16*s.* 1858, quarter, 4*l.* 13*s.* 3*d.* Total for 1854, 47*l.* 4*s.* 1*d.*
44. 1854, 230*l.* 17*s.* 4*d.*, including freight of stores, ferrage, &c. 1858, 191*l.* 6*s.* 10*d.*, ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store near to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made to the Corporation to have them adopted.
56. Signal mast and flag. No means for communicating by signals by night.
57. One keeper. Keeper relieved from the station as changes at other stations allow.

184.

COPELAND ISLAND.

East Coast of Ireland, on Summit of smaller Copeland Island, off South-east Side Entrance to Belfast Lough.

Lat. 54° 41' 44" N., Lon. 5° 32' 1" W.

3. No local authority.
4. Only one light.
5. Not ascertained; the old light having been transferred from the Revenue Board in 1810.
6. Not ascertained.
7. Selected by the Revenue Board as sea light, being requisite in the locality to guide vessels navigating the east side of St. George's Channel, or thence passing into or out of Belfast Lough or Donaghadee Sound.
8. 1796, date of first exhibition of light in old building, now used as a store and belfry.
9. Present lighthouse designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, and not by contract.
10. Sea light.
11. Stone tower, solid wall, without separate inner wall. The tower is circular, painted white, and is known also from its position on summit of the lighthouse island.
12. No separate external conductor. Wrought-iron handrail arranged to form a continuous conductor from lantern to base of tower.
13. 52 feet.
14. 131 feet.
15. 13 miles.
16. 17 miles.
17. 360°, lighted all around.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus since erection of the present lighthouse; burners adapted for use of rapeseed oil.
24. Reflectors from Soho Plate Company.
25. As in other catoptric lights, through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. Large fog bell struck by machinery.
27. 26 days.
28. 26 days.
29. 9,651*l.* 17*s.* 6*d.* (present lighthouse), including cost of lantern, light apparatus, &c. (outlay 1813 to 1816 inclusive.)
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high, 1,002*l.* (including cut stone blocking)
32. Not purchased, erected by Corporation.
33. 1*l.* 14*s.* 5*d.*
34. Coated with paint once every year, 55*l.* Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l.* 12*s.* 4*d.*; one at 46*l.* 3*s.*
36. 1,215*l.* total cost.
37. 1857, cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 7*s.* 4*d.* 1858, repairs, 15*l.* 19*s.* 2*d.*; cylinders, 7*l.* 4*s.*; cleaning stores, 2*l.* 7*s.* 4*d.*
38. 1857, oil, 1,090 gallons; wicks, 16 gross. 1858, oil, 1,089 gallons; wicks, 16 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 16*s.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 16*s.* total cost.
41. Fog bell, 230*l.*; machine, 170*l.*; belfry, &c., 130*l.* Total, 550*l.*
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 527*l.* 13*s.* 1*d.* 1858, quarter, 181*l.* 6*s.* Total for 1852, 2,110*l.* 12*s.* 1*d.*
44. 1852, 503*l.* 0*s.* 1*d.*, including boat attendance, freight of stores, &c. 1858, 557*l.* 14*s.* 3*d.*, ditto.
45. None.
46. None.
47. None.
48. Belfast Harbour Commissioners represent their opinion that the light would be more useful if placed on the Mew Island, 12th August 1859. Subject brought under notice of the Trinity Board.
49. Complaint made that the light had not been visible during fog on . . . On investigation this was disproved.
50. By Committee of Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. The light has not been known to have been extinguished at any time during night.
53. Spare lamp and burner kept ready. Oil stored in oil store near to lighthouse.
54. Barometer and thermometer.
55. Tide signals are not used; none have been applied for.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the stations as removals from other lighthouses require and allow.

185.

DONAGHADEE.

East Coast of Ireland, on Southern Pier-head, Donaghadee Harbour.

Lat. 54° 38' 4" Lon., 52° 32' 1" W.

3. No local authority.
4. One light.
5. Determined on when the harbour was planned for the post office packet service.
6. The engineer of the harbour proposed the lighthouse as necessary on the pierhead.
7. As lighting the east side of the channel of Donaghadee Sound, and leading into the harbour. After erection of the tower the lighthouse was transferred by the Government to the Port of Dublin Corporation.
8. 1836.
9. Designed by the late John Rennie, C.E., engineer of the harbour, and built by contract for the Government.
10. Harbour light.
11. Cut stone; solid wall; coated with cement inside; tower circular.
12. No separate external conductor.
13. 53 feet.
14. 56 feet.
15. 8½ miles.
16. 12 miles (uncoloured sector of light).
17. 360° all around.
18. Fixed. Light coloured red to seaward, from N. by E. to S. ½ E., and of the natural appearance, white, towards the harbour and entrance of Belfast Bay.
19. Fixed.
20. During every night, from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the light; burners adapted to the use of rapeseed oil.
24. De Ville, of London.
25. Through dome.
26. None used; none applied for at the harbour lighthouse.
27. None.
28. 13 days.
29. Improvements, 1,300*l*.
30. Finished.
31. Not ascertained; tower having been transferred by Government.
32. Not purchased; transferred.
33. 2*s*.
34. Coated with paint once every year, 12*l*. 12*s*. 10*d*. Paints procured by contract; workmanship not by contract.
35. One keeper, at 64*l*. 12*s*. 4*d*.
36. 415*l*. total cost.
37. 1857, cylinders, 2*l*. 2*s*, cleaning stores, 1*l*. 8*s*. 11*d*. 1858, repairs, 6*l*. 13*s*. 5*d*.; cylinders, 2*l*. 2*s*.; cleaning stores, 1*l*. 8*s*. 11*d*.
38. 1857, oil, 365 gallons; wicks, 7 gross. 1858, oil, 370 gallons; wicks, 7 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wick. 1857, 3*s*. 6*d*. per gross; 1*l*. 4*s*. 6*d*. total cost. 1858, 3*s*. 6*d*. per gross; 1*l*. 4*s*. 6*d*. total cost.
41. None.
42. From Mercantile Marine Fund.
43. No light dues charged.
44. 1852, 197*l*. 3*s*., including cost of freight of stores from Dublin. 1858, 161*l*. 12*s*. 8*d*., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in tower.
54. Barometer and thermometer.
55. None used. No requisition made to have tide signals used.
56. Signal mast and flag. No night signals.
57. One keeper. Keeper relieved from the station as changes at other lighthouses require and allow.

186.

SOUTH ROCK.

East Coast of Ireland, on Tidal Rock off East Coast of Co. Down.

Lat 54° 23' 55" N., 5° 25' 4" W.

3. No local authority.
4. Only one light.
5. Not ascertained; transferred by the Revenue Board.
6. Not ascertained.
7. The necessity for a sea light in the position, as one of the chain of lights to guide vessels along the west coast of the Irish Channel with sufficient offing from the projecting coast of Co. Down, and to indicate the tidal rock on which it is built, and the neighbouring rocks and shoals.
8. 1837.
9. Designed by Mr. Rogers, Engineer to the Revenue Board, by whom the lighthouse was transferred to the Port of Dublin Corporation.
10. Sea light.
11. Cut stone tower.
12. No separate external conductor.
13. 66 feet.
14. 32 feet.
15. 8 miles.
16. 12 miles.
17. 360°. Lighted all round the circle.
18. Revolving. The light of natural appearance, white.
19. A bright light or flash appears every minute and half, the light gradually increasing and decreasing in strength.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in general description or character. Lamps and burners altered for use with rapeseed oil at suggestion of Engineer to Port of Dublin Corporation.
24. Greenside and Co., Edinburgh.
25. Ventilation through dome; also ventilation in blocking and floor of lightroom to regulate supply of air.
26. Fog bells struck by machinery.
27. None.
28. None.
29. 18,031*l*. 9*s*. 5*d*., including lantern, light apparatus, three dwelling-houses, and shore establishment at Newcastle, Co. Down, and improvements of buildings.
30. Finished.
31. Lantern sash feet diameter, 6 feet high; 950*l*. estimated cost (including cut stone blocking).
32. Not purchased; transferred by the Revenue Board to Port of Dublin Corporation.
33. 4*l*. 3*s*. 6*d*.
34. Coated once each year, 44*l*. 2*s*. 11*d*. Paints procured by contract; workmanship not by contract.
35. Three keepers, one at 64*l*. 12*s*. 4*d*. per annum; two at 46*l*. 3*s*.
36. 750*l*. estimated cost.
37. 1857, cylinders, 4*l*. 10*s*.; cleaning stores, 2*l*. 9*s*. 4*d*. 1858, repairs, 18*l*. 11*s*. 8*d*.; cylinders, 4*l*. 10*s*.; cleaning stores, 5*l*. 9*s*. 4*d*.
38. 1857, oil, 461 gallons; wicks, 9 gross. 1858, oil, 466 gallons; wicks, 9 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross; 1*l*. 11*s*. 6*d*. total cost. 1858, 3*s*. 6*d*. per gross; 1*l*. 11*s*. 6*d*. total cost.
41. Not ascertained.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 368*l*. 19*s*. 1*d*. 1858, quarter, 155*l*. 1*s*. 10*d*. Total for 1852, 1,475*l*. 16*s*. 5*d*.
44. 1852, 552*l*. 8*s*. 10*d*. 1858, 460*l*. 19*s*. 1*d*.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in cisterns in the lighthouse.
54. Barometer and thermometer.
55. No tide signals used at this station.
56. No means of communicating signals by night.
57. Keeper on watch relieved in lighthouse at 12 o'clock, midnight. One keeper in turn relieved from rock each fortnight (weather permitting), and keepers are removed from the station as changes from other stations admit.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

187.

ARDGLASS.

East Coast of Ireland, Upper Room of Building, Inner Shore of Harbour.

3. No local authority.
4. One light.
5. 1812.
6. Mr. O'Gilvie.
7. Site of first lighthouse erected at Ardglass was selected as a suitable position for light on that part of the coast previously to the establishment of St. John's Point Light, and to light the approach to the harbour.
8. 1816, position changed in 1851.
9. Stone previously built for exhibition of temporary light.
10. Harbour light.
11. Rubble walling and brick.
12. No conductor.
13. 19 feet.
14. 17 feet.
15. miles.
16. miles.
18. Fixed; light coloured red.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 6th order.
24. Reflector from the Soho Plate Company.
25. Through roof of lantern.
26. None used.
27. None.
28. None.
29. Cost of building hired for temporary light not ascertained. Cost of dwelling (which appertained to the lighthouse first erected) about 400*l*.
31. Present temporary apparatus 50*l*.
32. Not purchased.
33. 10*s*. 11*d*., chiefly for repairs.
34. 8*s*. 8*d*. 1*d*. Paints procured by contract; workmanship not by contract.
35. One keeper at 46*l*. 3*s*.
36. Present temporary apparatus 50*l*.
37. 1857, cylinders, 18*s*.; cleaning stores, 10*s*. 10*d*. 1858, repairs, 2*l*. 8*s*.; cylinders, 18*s*.; cleaning stores, 10*s*. 10*d*.
38. 1857, oil, 60 gallons; wicks, 1 gross. 1858, oil, 60 gallons; wicks, 1 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross. 1858, 3*s*. 6*d*. per gross.
41. None used.
42. From Mercantile Marine Fund.
43. 1852, quarter, 4*l*. 0*s*. 11*d*. 1853, quarter, 8*d*. Total for 1852, 16*l*. 3*s*. 6*d*.
44. 1852, 186*l*. 4*s*. 1*d*., including cost of freight of stores, &c. from Dublin. 1853, 93*l*. 12*s*. 3*d*.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store.
54. None in 1858.
55. No tide signals used.
56. No night signals used.
57. One keeper.

188.

ST. JOHN'S POINT.

East Coast of Ireland, North Side of Dundrum Bay.

Lat. 54° 13' 10" N., Lon. 5° 40' W.

3. No local authority.
4. One light.
5. 1825.
6. Marquis of Downshire.
7. Being a prominent position, where a sea light was requisite, guiding seamen in keeping an offing from Dundrum Bay, and from the coast northward of the point.
8. 1844.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation; the tower and dwellings built by contract by Captain Browne of St. John's Point; the lantern erected by workmen of the Corporation.
10. Sea light.
11. Cut stone; circular tower, painted white; blocking under lantern sash and projecting gallery are coloured brown.
12. No external conductor. Usual arrangement of wrought-iron handrail to form continuous conductor from lantern to base of tower.
13. 73 feet.
14. 62 feet.
15. 9 miles.
16. 13 miles.
17. 203° E. ½ N. to W. by N. ½ N.
18. Intermittent. Light of natural appearance, white, to be coloured red.
19. Light visible during 45 seconds, and eclipsed during 15 seconds. The arrangement to produce eclipses of this light designed by the Engineer of the Port of Dublin Corporation.
20. During every night from sunset to sunrise.
21. Dioptric (catadioptric), curved metallic reflectors being set in tiers above and below dioptric belt.
22. 1st order.
23. Not altered since 1845.
24. Refractors and tier of reflectors manufactured by Cookson, of Newcastle; the frame and lamps by Wilkins, of London.
25. Ventilating tube continued through centre of dome. (Faraday's) tube in this and in the other dioptric lights of the Port of Dublin Corporation.
26. None at this station.
27. None.
28. 9 days.
29. 11,091*l*. 1*s*., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high; 1,055*l*, including cut stone blocking.
32. Not purchased; erected by the Corporation.
33. 4*l*. 6*s*. 8*d*.
34. General coating of paint once in each year, 45*l*. 19*s*. 3*d*. Paints procured by contract; workmanship not by contract.
35. Two keepers, one at 64*l*. 12*s*. 4*d*., one at 46*l*. 3*s*.
36. 1,096*l*.; 153*l*.; 1,00*l*. Total, 1,552*l*.
37. 1857, cylinders, 4*l*. 4*s*.; cleaning stores, 2*l*. 5*s*. 4*d*. 1858, repairs, 4*l*. 12*s*. 4*d*.; cylinders, 4*l*. 4*s*.; cleaning stores, 2*l*. 5*s*. 4*d*.
38. 1857, oil, 404 gallons; wicks, 3¼ gross. 1858, oil, 392 gallons; wicks, 3¼ gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Cotton concentric wicks. 1857, 2*l*. 5*s*. total cost. 1858, 2*l*. 5*s*. total cost.
41. None.
42. Light maintained from Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 395*l*. 2*s*. 8*d*. 1858, quarter, 110*l*. 10*s*. 5*d*. Total for 1852, 1,580*l*. 10*s*. 10*d*.
44. 1852, 420*l*. 2*s*. 7*d*., including freight of stores, &c. 1858, 291*l*. 1*s*. 3*d*., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 858.
52. Not known to have been extinguished during night between 1848 and 1858.
53. At least two spare burners kept in readiness.
54. Barometer and thermometer.
55. Tide signals are not used.
56. Signal mast and flag. No means of communicating signals by night.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight. Keepers changed from the station as changes from other stations require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

189.

CARLINGFORD.

East Coast of Ireland, on Haulboline Tidal Rock.

Lat. 54° 1' N., Lon. 6° 5' W.

3. No local authority.
4. One main light shown constantly during night; there is also in the same tower a half-tide light placed below the other, shown at and after half-flood.
5. 1819.
6. Shipowners of Newry.
7. To serve as a sea light on that part of the coast of Down, and to guide from seaward to the bar and through the entrance channel into Carlingford Lough; also to mark the tidal low-water rock on which it stands, and the rocky shoals in the vicinity.
8. 1823.
9. Designed by the late George Halpin, Engineer to the Port of Dublin Corporation. Built under his direction by the workmen of the Corporation, and not by contract.
10. Sea light.
11. Cut stone tower, solid walls; the tower is circular, painted white; readily identified as a shaft of masonry standing in the sea; the rock uncovers only at the low water of spring tides.
12. No separate or external lightning conductor.
13. 3 feet.
14. 101 feet.
15. 12½ miles.
16. 17 miles.
17. 225° S.S.E. to W.N.W.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. Main light in the lantern is shown during every night from sunset to sunrise. The lower tide light in same tower is shown from half-flood to half-ebb.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Noho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. Two fog bells struck by machinery.
27. 9 days.
28. 9 days.
29. 28,396*l.* 17*s.* 3*d.* (to year 1826 inclusive), including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 13 feet diameter, 8 feet high. 1,150*l.* approximate total cost.
32. Not purchased; erected by Corporation.
33. 22*l.* 4*s.* (This outlay nearly altogether for repairs of the shore dwellings at Cranfield Point.)
34. Coated with paint once every year, 63*l.* 12*s.* 2*d.* Paints procured by contract; workmanship not by contract.
35. Three keepers, one at 64*l.* 12*s.* 3*d.*, two at 46*l.* 3*s.*
36. 1,560*l.*
37. 1857, repairs, 17*l.* 12*s.* 3*d.*; cylinders, 8*l.* 2*s.*; cleaning stores, 3*l.* 5*s.* 1858, repairs, 6*l.* 1*s.* 5*d.*; cylinders, 8*l.* 2*s.*; cleaning stores, 3*l.* 5*s.*
38. 1857, oil, 571 gallons; wicks, 16 gross. 1858, oil, 987 gallons; wicks, 16 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 2*l.* 16*s.* total cost. 1858, 3*s.* 6*d.* per gross; 2*l.* 16*s.* total cost.
41. 550*l.* probable cost.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 412*l.* 0*s.* 6*d.* 1858, quarter, 129*l.* 11*s.* 11*d.* Total for 1852, 1,648*l.* 2*s.* 1*d.*
44. 1852, 637*l.* 17*s.*, including boat attendance, freight of stores from Dublin. 1858, 505*l.* 1*s.* 10*d.*, ditto.
45. None.
46. None.
47. None.
48. No representation or complaint as to the position of the light.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished. The catoptric lamps are not liable to accidental extinction, unless through damage, which would destroy the lantern sash.
53. Spare lamp and burner kept ready. Oil for use kept in the lighthouse.
54. Barometer and thermometer.
55. There is a half-tide light shown during night from half-flood to high water and to half-ebb, and during day a large ball is hoisted on a metal shaft (above the lantern) from half-flood to half-ebb.
56. Signal mast and flag. No night signals used. none applied for.
57. Keeper on watch relieved in the lightroom at 12 o'clock, midnight, and the keepers are removed from the station as changes from other lighthouses require and allow.

190.

CARLINGFORD LOUGH.

East Coast of Ireland, on Greenore Point.

Lat. 54° 1' 55" N., Lon. 6° 7' 52" W.

3. No separate local agent, lightkeeper acting as at other stations.
4. One light.
5. 1827.
6. Chamber of Commerce, Newry.
7. To form with the Carlingford outer lighthouse leading marks to clear outer dangers; also serving as an inner harbour light.
8. 1830.
9. Designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his supervision by workmen of the Corporation, and not by contract.
10. Harbour light.
11. Stone tower; solid wall; coated inside with cement; coloured white outside. Identified by circular form of tower and prominent position on Greenore Point.
12. Wrought-iron handrail in tower forms a continuous conductor from lantern to base. No separate external conductor.
13. 41 feet.
14. 29 feet.
15. 6 miles.
16. 9 miles.
17. 225° S.S.E. to W.N.W.
18. Revolving.
19. Every 45 seconds.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general description or character of the illuminating apparatus since 1845.
24. Reflectors from Noho Plate Company.
25. Ventilation through dome; also ventilation in blocking and floor of lightroom to regulate supply of air.
26. No fog signals at this station.
27. None.
28. None.
29. 5,207*l.* 12*s.* 3*d.*, including cost of lantern, light apparatus, &c.
30. Finished.
31. 724*l.* (including stone blocking).
32. Not purchased; erected by workmen of the Corporation.
33. 4*l.* 10*s.* 7*d.*
34. General coating of paint once in each year, 26*l.* Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l.* 12*s.* 4*d.*
36. 396*l.* 11*s.*; 128*l.* 10*s.* Total, 525*l.* 1*s.*
37. 1857, repairs, 6*l.* 9*s.* 1*d.*; cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 1*s.* 8*d.* 1858, repairs, 12*l.* 12*s.* 7*d.*; cylinders, 2*l.* 14*s.*; cleaning stores, 1*l.* 1*s.* 8*d.*
38. 1857, oil, 246 gallons; wicks, 5 gross. 1858, oil, 256 gallons; wicks, 5 gross.
39. Pale rapeseed oil. 1857, 4*s.* 2½*d.* per gallon. 1858, 3*s.* 5*d.* per gallon.
40. Argand cotton wicks. 1857, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost. 1858, 3*s.* 6*d.* per gross; 17*s.* 6*d.* total cost.
41. No fog signals at this lighthouse; fog bells at the outer lighthouse.
42. Light maintained from Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 4.
43. 1852, quarter, 44*l.* 6*s.* 1*d.* 1858, quarter, 10*l.* 3*s.* 9*d.* Total for 1852, 177*l.* 4*s.* 5*d.*
44. 1852, 202*l.* 7*s.* 2*d.*, including freight of stores, &c. 1858, 214*l.* 9*s.* 10*d.*, ditto.
45. None.
46. None.
47. None.
48. There has not been any representation or complaint as to the light being unnecessary or in an unsuitable position.
49. No complaint or representation as to the efficiency of the light.
50. By Committee of the Port of Dublin Corporation and by Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. One spare lamp and burner kept in readiness. Oil stored in oil store close to lighthouse.
54. None in 1858.
55. No tide signals used at this station, half tide signals being made visible in view of it at the outer Carlingford lighthouse.
56. Signal mast and flag.
57. One keeper; changed from the station to meet arrangement of changes of keepers from other stations.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

191.

DUNDALK.

East Coast of Ireland, North Side of Channel within the Bar.

Lat. 53° 58' 40" N., Lon. 6° 18' W.

3. No agent or local authority, lightkeepers communicating with Ballast Office.
4. One light.
5. 1846.
6. Dundalk Harbour Commissioners.
7. To guide vessels from sea to bar channel through channel near to lighthouse, and in the reach westward of the lighthouse.
8. 1855.
9. Designed by George Halpin, Engineer to Port of Dublin Corporation. Screw piles and keeper's dwelling were built under contract by Mr. Mitchell, the inventor and patentee of screw piles. The lantern erected by workmen of the Corporation.
10. Harbour light.
11. Sheet iron house of octagonal form, borne on nine wrought iron piles, which are coloured red, readily recognised by the open appearance of the screw piles, which are spaced apart in the angles of octagon.
12. The whole lighthouse forms a large continuous conductor, the lantern of metal, the dwelling of sheet iron, bearing on wrought iron piles set in the north side of channel.
13. 72 feet from base screws to vane; height from surface of sand to vane varies as the sand shifts.
14. 33 feet.
15. 6½ miles.
16. 9 miles.
17. Ranges of light, 85°, bright to seaward; 146°, red to west side of bay; 22°, bright to harbour channel. Screened in direction of Dunany reefs.
18. Flashing. The light is coloured red towards west side of Dundalk Bay; of natural appearance, or white, to seaward.
19. Bright flash every 15 seconds.
20. During every night, from sunset to sunrise.
21. Dioptric.
22. 4th order.
23. No alteration in the description or character of the illuminating apparatus found necessary or suggested.
24. Wilkins, of Long Acre, London.
25. Tube through centre of dome. Ventilation in blocking or pedestal of lightroom, to regulate supply of air.
26. Some progress made under contract for supplying fog bell and machine for this lighthouse.
27. None.
28. 12 days.
29. 6,083l. 3s. 5d., including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash 8 feet diameter, 4 feet high; 151l
32. Erected by Port of Dublin Corporation, not purchased.
33. None.
34. General coating of paint once each year, 20l. 16s. 8d. Paints procured by contract; workmanship not by contract.
35. One keeper at 46l. 3s.; one helper at 56l. 10s.
36. 317l. 8s. 7d.; 131l. 10s. 10d. Total, 449l. 0s. 5d.
37. 1857, repairs, 18s.; cylinders, 18s.; cleaning stores, 1l. 1s. 8d. 1858, repairs, 17s.; cylinders, 18s.; cleaning stores, 1l. 1s. 8d.
38. 1857, oil, 110 gallons. 1858, oil, 109 gallons.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Cotton concentric wick. 1857, 15s. total cost. 1858, 15s. total cost.
41. Not yet procured.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. Not lighted in 1852. For quarter, 1858, 14l. 5s. 3d.
44. 1852, 245l. 19s. 8d. (including boat attendance and carriage of stores.) 1858, 259l. 2s. 3d. (ditto.)
45. None.
46. None.
47. None.
48. No complaints or representation as to the light being unnecessary or in an unsuitable position.
49. None.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. By Committee of Board in 1858; by Superintendent in August 1858.
52. Not known to have been extinguished during night since established.
53. At least one spare lamp kept in readiness.
54. None in 1858.
55. Tide signals are not used at this station.
56. No night signals used.
57. Keeper on watch is relieved in the lightroom at 12 o'clock, midnight. Keepers are changed from the station as changes from other stations require and allow.

192.

DROGHEDA, NORTH.

East Coast of Ireland.

Lat. and Lon. for Drogheda, East, stated in Special Return.

3. No local authority.
4. One light lighted. Timber framing for a second placed but not lighted.
5. 1838.
6. Drogheda Town and Harbour Commissioners.
7. The site being well placed for an inner harbour light for guidance of vessels within the bar and entrance of the channel.
8. 1842.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation. The timber framing supplied under contract by Messrs. Carolin, of Dublin.
10. Harbour light.
11. The lighthouse chiefly of timber; open framing; moveable on parallel ways.
12. No conductor.
13. 25½ feet.
14. 23 feet.
15. 6 miles.
16. 10 miles, shown to inner reach of the harbour within bar.
17. 11° S.E. by E. ½ E. to S.E. by S. ½ S.
18. Fixed. The light coloured red.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 4th order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None; none applied for.
27. None.
28. None.
29. 1,550l.
30. Finished.
31. Lantern sash 7 feet diameter, 4 feet high; 7l.
32. Not purchased; erected by Corporation.
33. 5l. 12s.
34. Coated with paint once every year, 14l. 15s. 10d. Paints procured by contract; workmanship
35. One keeper at 46l. 3s.
36. 140l.
37. 1857, repairs, 1l. 8s.; cylinders, 1l. 16s.; cleaning stores, 1l. 0s. 3d. 1858, cylinders, 1l. 16s.; cleaning stores, 1l. 0s. 8d.
38. 1857, oil, 100 gallons; wicks, 4 gross. 1858, oil, 101 gallons; wicks, 4 gross.
39. Pale rapeseed oil. 1857, 4s. 2½d. per gallon. 1858, 3s. 5d. per gallon.
40. Argand cotton wicks. 1857, 3s. 6d. per gross; 14s. total cost. 1858, 3s. 6d. per gross; 14s. total cost.
41. None used.
42. From Mercantile Marine Fund.
43. 1852, quarter, 18l. 6s. 9d. 1858, quarter, 10l. 12s. 9d. Total for 1852, 73l. 7s.
44. 1852, 153l. 19s. 10d., including cost of freight of stores, &c. from Dublin. 1858, 145l. 18s. 9d., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Board and by the Superintendent of Lighthouses.
51. On circuit of inspection, 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. None in 1858.
55. No tide signals used.
56. No light signals used.
57. One keeper.

193.

DROGHEDA, EAST.

East Coast of Ireland.

Lat. 52° 43' N., Lon. 6° 15' W.

3. No local authority.
4. Two lights; the east light bearing from the west light E. by S., distant 100 yards.
5. 1838.
6. Drogheda Town and Harbour Commissioners.
7. As forming with the west lighthouse leading marks to guide through the bar channel.
8. 1842.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation. The timber framings were supplied by Messrs. Carolin, Builders, of Dublin.
10. Harbour light.
11. Timber; small lightroom borne on timber frame moving on parallel beams, allowing of removal of position to suit changes in the bar channel.
12. No conductor.
13. 25½ feet.
14. 27 feet.
15. 6 miles.
16. 10 miles.
17. 93° N.E. ½ N. to S.E. by S. ½ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None used.
27. None.
28. 9 days.
- 29.
30. Completed, unless occasional repairs.
31. Lantern sash 7 feet diameter, 4 feet high; *l*.
32. Not purchased.
33. 2*l*. 16*s*.
34. Coated with paint once every year, 7*l*. 7*s*. 11*d*. Paints procured by contract; workmanship not by contract.
35. One keeper at 46*l*. 3*s*., of which one half charged to the west lighthouse.
36. 185*l*.
37. 1857, repairs, 2*l*. 7*s*.; cylinders, 2*l*. 14*s*.; cleaning stores, 1*l*. 0*s*. 8*d*. 1858, cylinders, 2*l*. 14*s*.; cleaning stores, 1*l*. 0*s*. 8*d*.
38. 1857, oil, 135 gallons; wicks, 5 gross. 1858, oil, 134 gallons; wicks, 5 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross; 17*s*. 6*d*. total cost. 1858, 3*s*. 6*d*. per gross; 17*s*. 6*d*. total cost.
41. None used.
42. From Mercantile Marine Fund.
43. 1852, quarter, 18*l*. 6*s*. 9*d*.; 1858, quarter, 10*l*. 12*s*. 9*d*. Total for 1852, 73*l*. 7*s*.
44. See Drogheda, North.
45. None.
46. None.
47. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection, 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready.
54. None in 1858.
55. No tide signals used.
56. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

194.

DROGHEDA, WEST.

East Coast of Ireland.

Lat. and Lon. for Drogheda, East, stated in Special Return. ²

3. No local authority.
4. Two lights; the west light bearing from the east light W. by N., distant 100 yards.
5. 1838.
6. Drogheda Town and Harbour Commissioners.
7. As suitable position, inner light to form with east light leading marks to guide through the bar channel.
8. 1842.
9. Designed by George Halpin, Engineer to the Port of Dublin Corporation, and Superintendent of Lighthouses. The timber framings were supplied by the Messrs. Carolin, Builders, of Dublin.
10. Harbour light.
11. Timber; small lightroom borne on timber frame moving on parallel beams, allowing of removal of position to suit changes in the bar channel.
12. No conductor.
13. feet.
14. 40 feet.
15. 7½ miles.
16. 11 miles.
17. 120° N.E. ½ N. to S.E. by S. ½ S.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 3rd order.
23. No alteration in the general character of the illuminating apparatus.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None used.
27. None.
28. None.
- 29.
30. Complete. Repairs will from time to time be required, lighthouse being of timber.
31. Lantern sash 7 feet diameter, 4 feet high; *l*.
32. Not purchased.
33. 2*l*. 16*s*.
34. Coated with paint once every year, 7*l*. 7*s*. 10*d*. Paint procured by contract; workmanship not by contract.
35. One keeper at 46*l*. 3*s*., of which one half charged to the east lighthouse.
36. 185*l*.
37. 1857, repairs, ; cylinders, ; cleaning stores, 1858, repairs, ; cylinders, ; cleaning stores.
38. 1857, oil, 135 gallons; wicks, 5 gross. 1858, oil, 134 gallons; wicks, 5 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross. 1858, 3*s*. 6*d*. per gross.
41. None.
42. From Mercantile Marine Fund.
43. 1852, quarter, 18*l*. 6*s*. 9*d*.; 1858, quarter, 10*l*. 12*s*. 9*d*. Total for 1852, 73*l*. 7*s*.
44. See Drogheda, North.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection, 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready.
54. None in 1858.
55. No tide signals used.
56. No night signals used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

195.

BALBRIGGAN.

East Coast of Ireland, North-eastern Shoulder of East Pierhead.

Lat. 53° 36' 45" N., Lon. 6° 11' W.

3. No local authority.
4. One light.
5. Not ascertained.
6. Not ascertained.
7. For guidance of vessels passing along the west side of St. George's Channel; also to guide to Balbriggan Pier and Harbour.
8. 1769.
9. Transferred to Port of Dublin Corporation by Revenue Board in 1810.
10. Classed as sea light during year stated in this Return.
11. Cut stone; solid walling; tower of circular form, coloured white.
12. No separate external conductor. Usual arrangement of wrought-iron handrail.
13. 53 feet.
14. 42 feet.
15. 7½ miles.
16. 11 miles.
17. 225° N. by W. ½ W. to S.W. ½ W.
18. Fixed.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None used; no application made to have them used.
27. None.
28. 12 days.
29. 3,136*l*.
30. Finished.
31. Lantern sash 9½ feet diameter, 6 feet high. 550*l*.
32. Not purchased; transferred by the Revenue Board.
33. 7*l* 2*s*. 2*d*.
34. Coated with paint once every year, 24*l*. 19*s*. 10*d*. Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l*. 12*s*. 4*d*.
36. 325*l*.
37. 1857, cylinders, 2*l*. 14*s*.; cleaning stores, 1*l*. 3*s*. 8*d*. 1858, repairs, 1*l*. 14*s*. 4*d*.; cylinders, 2*l*. 14*s*.; cleaning stores, 1*l*. 3*s*. 8*d*.
38. 1857, oil, 250 gallons; wicks, 5 gross. 1858, oil, 231 gallons; wicks, 5 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross; 17*s*. 6*d*. total cost. 1858, 3*s*. 6*d*. per gross; 17*s*. 6*d*. total cost.
41. None used.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 365*l*. 11*s*. 11*d*. 1858, quarter, 88*l*. 17*s*. 8*d*. Total for 1852, 1,462*l*. 7*s*. 7*d*.
44. 1852, 339*l*. 19*s*. 3*d*., including cost of freight of stores, &c. from Dublin. 1858, 160*l*. 2*s*. 4*d*., ditto.
45. None.
46. None.
47. None.
48. No representation made as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store.
54. Barometer and thermometer.
55. No tide signals used; no application made to have them used.
56. No night signal used.
57. One keeper. Keeper changed from the station as changes from other stations require and allow.

196.

HOWTH PIER.

East Coast of Ireland, on Centre of East Pierhead of Howth Harbour.

Lat. 53° 24' N., Lon. 6° 4' W.

3. No local authority.
4. One light.
5. Light on pierhead formed part of original design for Howth Harbour.
6. Authorities of the harbour.
7. A light being requisite there to guide vessels from and to seaward, and to light entrance channel.
8. 1818.
9. Designed by the late John Rennie, C.E.; built as portion of the harbour works.
10. Harbour light.
11. Cut stone; solid walling; tower is circular, coloured white; the adjoining dwelling is of oblong form.
12. No separate external conductor.
13. 37 feet.
14. 43 feet.
15. 7½ miles.
16. 11 miles (in very clear weather only.)
17. 180° S.E. ¼ S. to N.W. ¼ N. 112° S. by W. to N.W. by W.
18. Fixed. The light is coloured red to seaward.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 2nd order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil. Red cylinders substituted for large red discs for colouring the light at suggestion of the engineer of the Corporation.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern.
26. None used.
27. None.
28. 10 days.
29. Not ascertained; lighthouse having been erected in connexion with harbour work by the Government.
30. Finished.
31. Not ascertained; lighthouse having been built by Government.
32. Not purchased.
33. 3*l*. 10*s*. 2*d*.
34. Coated with paint once every year, 23*l*. 5*s*. 1*d*. Paints procured by contract; workmanship not by contract.
35. One keeper at 64*l*. 12*s*. 4*d*.
36. 885*l*. probable cost.
37. 1857, repairs, 3*l*. 0*s*. 6*d*.; cylinders, 3*l*. 12*s*.; cleaning stores, 1*l*. 10*s*. 7*d*. 1858, repairs, 3*l*. 16*s*. 4*d*.; cylinders, 3*l*. 12*s*.; cleaning stores 1*l*. 10*s*. 7*d*.
38. 1857, oil, 610 gallons; wicks, 8 gross. 1858, oil, 608 gallons; wicks, 8 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wick 1857, 3*s*. 6*d*. per gross; 1*l*. 8*s*. total cost. 1858, 3*s*. 6*d*. per gross; 1*l*. 8*s*. total cost.
41. None used. There is a large fog bell struck by machinery at the Howth Baily Lighthouse.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, not charged. 1858, not charged.
44. 1852, 208*l*. 9*s*. 5*d*., including carriages of stores from Dublin. 1858, 203*l*. 2*s*. 10*d*., ditto.
45. None.
46. None.
47. None.
48. None.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. On circuit of inspection in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. None in 1858.
55. No tide signal used.
56. No night signal used.
57. One keeper. Keeper changed from the station as changes from other lighthouses require and allow.

PORT OF DUBLIN CORPORATION, BALLAST OFFICE.

197.

HOWTH BAILY.

East Coast of Ireland, on extreme Southern Point of the Baily.

Lat. 53° 21' 40" N., Lon. 6° 3' 20" W.

8. No local authority.
4. One light.
5. Not ascertained.
6. Not ascertained.
7. The old lighthouse erected by the Revenue Board had been placed too far from the shore, and on too high ground. The Port of Dublin Corporation selected the present position as the most southern and projecting point, and much less liable to be obscured by fogs.
8. Present light exhibited in 1813.
9. Present lighthouse designed by the late George Halpin, Engineer to Port of Dublin Corporation, and built under his direction by the workmen of the Corporation, not by contract.
10. Sea light.
11. Chiefly cut stone; solid wall; the lighthouse on summit of the point is of circular form, coloured white.
12. No separate external conductor. Wrought-iron handrail forms a continuous conductor from lantern to base of tower.
13. 42 feet.
14. 134 feet.
15. 13¼ miles.
16. 17½ miles.
17. 270° N.E. by N. to N.W. ¾ W.
18. Fixed. Light of natural appearance, white.
19. Fixed.
20. During every night from sunset to sunrise.
21. Catoptric.
22. 1st order.
23. No alteration in the general character of the illuminating apparatus. Burners adapted for use of rapeseed oil.
24. Reflectors from the Soho Plate Company.
25. Through dome of lantern. There are also ventilators in the blocking and floor of lightroom to regulate supply of air.
26. Large fog bell struck by machinery.
27. 26 days.
28. 26 days.
29. *l* including cost of lantern, light apparatus, &c.
30. Finished.
31. Lantern sash, 13 feet diameter, 8 feet high; *l*.
32. Not purchased; the old lighthouse transferred by the Revenue Board; the present light erected by Port of Dublin Corporation.
33. 9*l*. 1*s*. 8*d*.
34. Coated with paint once every year, 57*l*. 9*s*. 8*d*. Paints procured by contract; workmanship not by contract
35. Two keepers, one at 64*l*. 12*s*. 4*d*.; one at 46*l*. 3*s*.
36. 930*l*. total cost.
37. 1857, cylinders, 7*l*. 4*s*.; cleaning stores, 2*l*. 9*s*. 1858, repairs, 19*l*. 14*s*. 6*d*.; cylinders, 7*l*. 4*s*.; cleaning stores, 2*l*. 9*s*
38. 1857, oil, 730 gallons; wicks, 12 gross. 1858, oil, 727 gallons; wicks, 12 gross.
39. Pale rapeseed oil. 1857, 4*s*. 2½*d*. per gallon. 1858, 3*s*. 5*d*. per gallon.
40. Argand cotton wicks. 1857, 3*s*. 6*d*. per gross; 2*l*. 2*s*. total cost. 1858, 3*s*. 6*d*. per gross; 2*l*. 2*s*. total cost.
41. Fog bell, ; machine, ; belfry, &c.
42. From Mercantile Marine Fund. Revenue collected and paid as per statement in Special Return No. 1.
43. 1852, quarter, 1,033*l*. 10*s*. 5*d*. 1858, quarter, 826*l*. 7*s*. 8*d*. Total for 1852, 4,134*l*. 1*s*. 6*d*.
44. 1852, 533*l*. 1*s*. 4*d*., including cost of freight of stores, &c. from Dublin. 1858, 276*l*. 13*s*. 1*d*., ditto.
45. None.
46. None.
47. None.
48. No complaint or representation made as to the light being unnecessary or placed in an unsuitable position.
49. None.
50. By Committee of the Port of Dublin Corporation and by the Superintendent of Lighthouses.
51. Inspected in 1857; ditto, 1858.
52. Not known to have been extinguished.
53. Spare lamp and burner kept ready. Oil stored in oil store close to the lighthouse.
54. Barometer and thermometer.
55. No tide signals used; no application made to have them used.
56. Signal mast and flag. No night signals used.
57. Keeper on watch relieved in the lighthouse at 12 o'clock, midnight. Keepers are changed from the station as changes from other lighthouses require and allow.

CIRCULARS Nos. II. & IV.—FLOATING LIGHTS.

IRELAND.
Circular II.

GENERAL RETURN.

I. Port of Dublin Corporation.
II. The "Seagull," moored off the north end of the Kish Bank, Bay of Dublin; "Relief," moored off the north end of the Arklow Bank, coast of Wicklow; "Brilliant," moored off the north end of the Blackwater Bank, coast of Wexford; "Petrel," moored off the Coningbeg Rock, near Saltee Islands, coast of Wexford.
III. Where dangerous sand banks and sunken rocks exist in the general track of shipping, and where light-houses cannot be erected.
IV. A spare floating light is kept moored off the Corporation's stores in Dublin; she has a mate and two seamen attached to her; is fully equipped with stores and ready for immediate service; a full crew to take her to a station can always be procured before a steamer could be hired to tow her, and to get her steam up. The time this would take would depend on whether there were any steamers available for this purpose in the harbour of Dublin. The Corporation have no steamer of their own for this service.

V. The floating lights by day all carry a ball or balls at their mast helads. To distinguish them from each other by day they have also the name of the rock or bank which they are placed to mark painted on their sides. By night they are distinguished from each other by the character of their lights, which in the four floating lights differ.

VI. There is a marked peculiarity of lights exhibited by floating lights on the coast of Ireland, which ensures them from being mistaken for ships' lights. The Arklow floating light, the only one that exhibits a single fixed light, is so superior in brilliancy to the ordinary ships' lights that it is next to impossible to mistake it.

VII. The only description of illuminating apparatus used in the floating lights is catoptric.

VIII. Catoptric illuminating apparatus only is used in the floating lights, as it is considered to be the best adapted for them.

IX. The Kish Bank floating lights exhibit three fixed lights triangular. The Arklow floating light exhibits one single bright fixed light. The Blackwater Bank light exhibits one revolving and one fixed bright light on different masts and at different altitudes. The Coningbeg light exhibits two bright fixed lights at different altitudes and on different masts.

X. The illuminating apparatus for a floating light is decided on, always bearing in mind the character of the lights in the vicinity, to avoid as much as possible any mistake in the characters, and also with a view to the efficiency of the light.

XI. Table of Prices—

SEAGULL, at Kish Bank. Three-light catoptric; 8 burners in each; total, 24 burners. Reflectors, 12 inches in diameter.

Price	-	-	Three fixed, 1,140l.
Ordinary repairs	-	-	28l. 7s. 4d.
Oil	{	Consumption	- 17 galls. 1 qt.
	{	Cost	- 2l. 17s. 6d.
Wicks	{	Consumption	- 4s.
	{	Cost	- 1s. 4d.

The consumption of oil differs considerably at times, owing to the quality of oil supplied; the same may be said of the consumption of wicks, which differs with different oil.

RELIEF, at Arklow Bank. One-light catoptric; 16 burners. Reflectors, 12 inches in diameter.

Price	-	-	One fixed, 703l. 9s. 2d.
Ordinary repairs	-	-	21l. 1s.
Oil	{	Consumption	- 12 galls. 1 qt.
	{	Cost	- 2l. 0s. 10d.
Wicks	{	Consumption	- 4s.
	{	Cost	- 1s. 4d.

In the year 1857, owing to some impurities in the oil, the wicks were destroyed after one night's burning.

BRILLIANT, at Blackwater Bank. One fixed catoptric; 8 burners. One revolving catoptric; 4 burners. Reflectors, 12 inches in diameter.

Price	-	-	One fixed, 315l. 8s.
Ordinary repairs	-	-	10l. 10s.
Oil	{	Consumption	- 6 galls. 1qt.
	{	Cost	- 1l. 0s. 10d.
Wicks	{	Consumption	- 20.
	{	Cost	- 63d.
Price	-	-	One revolving, 560l. 7s. 11d.
Ordinary repairs	-	-	14l.

Oil	{	Consumption	- 3 galls. 2 qts.
	{	Cost	- 11s. 8d.
Wicks	{	Consumption	- 12.
	{	Cost	- 4d.

PETREL, at Coningbeg Station. Two lights, catoptric; 8 burners in each lantern; total, 16 burners. Reflectors, 12 inches in diameter.

Price	-	-	Two fixed, 794l. 9s. 4d.
Ordinary repairs	-	-	22l.
Oil	{	Consumption	- 11 galls. 2 qts.
	{	Cost	- 1l. 18s. 4d.
Wicks	{	Consumption	- 34.
	{	Cost	- 114d.

XII. Herewith sent.

XIII. Bells were formerly used on board floating lights, but were discontinued as being liable to be mistaken for ships' bells, since which large and well-toned gongs have been substituted for them; these can only be heard at a short distance. Experiments have been made with an atmospheric whistle, but found not to answer. A gun was also under consideration, but objected to by the Board of Trade.

XIV. No tide signals are used in the floating lights, there being no tidal harbours in the vicinity of any of them, except the harbour and river of Dublin, which has a tide light shown from the lighthouse at the entrance.

XV. "Blackwater Bank." From Alderman Green on part of shipowners of Waterford, February 19th, 1856. Alderman Green informed that measures had been taken for establishing a light there, July 21st, 1856.

Application from Galway Harbour Commissioners for a light on Margaretta Rock, October 9th, 1859.

Galway Harbour Commissioners informed the Board of Trade would not sanction same, October 12th, 1858.

XVI. Total maintenance from year 1845 to 1858 (both inclusive):

Year	£	s.	d.	£	s.	d.
1845	-	-	-	3,965	7	6
1846	-	-	-	3,619	6	7
1847	-	-	-	3,565	1	1
1848	-	-	-	2,580	14	11
1849	-	-	-	5,127	18	7
1850	-	-	-	2,767	17	7
1851	-	-	-	3,662	1	3
1852	-	-	-	2,306	16	4
1853	-	-	4,573	4	7	
"	"	N.W.	4,600l.	17	17	6
"	"	"	401	4	1	
				4,992	6	2
"	1854	-	-	3,966	2	5
"	1855	-	-	5,700	8	2
"	1856	-	-	4,146	0	1
"	1857	-	-	3,687	2	10
"	1858	-	-	5,065	8	1

XVII. Improvements of this nature are always referred to competent parties to inquire and report as to the value of same and the probable expense.

XVIII. There are no printed forms for inspection, but it is the duty of the marine inspector to inspect these vessels frequently, and to report to the board anything which requires their interference. Other printed forms for the persons in charge are herewith sent.

XIX. In 1856 Waterford merchants applied for light on Blackwater Bank; Board of Trade sanction, 1857. September 1858, Galway Harbour Commissioners applied for a lightvessel or bell buoy for the better marking of the Margaretta Rock, Galway Bay; application recommended by the Board for the favourable consideration of Privy Council for Trade, who refused to "sanction any outlay from the Mercantile Marine Fund for that purpose."

XX. A Committee of the Commissioners having within the last month inspected these vessels, have reported them as being in the best order and altogether in a most efficient state.

This Corporation recommend the placing of a fog gun on board the "Kish" lightship, 19th February, 1859. Board of Trade refuse to sanction, 18th April, 1859; (22nd November 1859; 3d December, 1859.) Messrs. Wilkins, of London, have agreed with the Corporation to supply an improved fog bell worked by machinery, to be placed on the Kish lightvessel, which bell they guarantee will be distinctly heard at a distance of at least three miles to windward of the vessel, in any and every state of weather. Board of Trade have sanctioned same. See also Special Return.

FLOATING LIGHTS—(SPECIAL RETURNS).

SPECIAL RETURNS.

Index Map 34.

KISH BANK FLOATING LIGHT.

- I. "Seagull." Moored off north end of Kish Bank, Dublin Bay.
- II. Depth of water, $8\frac{1}{2}$ fathoms. Bottom, fine sand. Maximum strength of tide, $2\frac{1}{2}$ knots.
- III. Port of Dublin Corporation.
- IV. No local agent employed.
- V. In 1810, by Corporation to Lord Lieutenant.
- VI. To guard vessels from Kish Bank, which lies in the fair way for Kingstown and Dublin Harbours.
- VII. Since November 16, 1811.
- VIII. Three lights are exhibited, one from the foremast 26 feet, one from mainmast 36 feet, and one from mizen mast 24 feet above the level of the water.
- IX. See builder's specification herewith sent.
- X. See builder's specification herewith sent.
- XI. 163 tons.
- XII. Built at Bristol by Charles Hill and Son.
- XIII. Aft, 8 ft. 9 in.; forward, 8 ft. 1 in.
- XIV. Black, with a white streak.
- XV. Carries a ball at the mainmast head, has "Kish Bank" painted in white letters on her sides.
- XVI. Has three masts, a fore staysail, fore lug, mainsail, and mizen lug.
- XVII. One from the main truck to the water, and one from the fore and mizen trucks to the eyes of the chain rigging. The chain plates have copper bands $\frac{1}{2}$ in. by $\frac{1}{2}$ in. attached to them, which hands reach to the 6 ft. water line.
- XVIII. Moored with a mushroom anchor and 200 fathoms of chain; has a spare mushroom and 200 fathoms of chain.
- XIX. Mushroom anchor 44 cwt., chain cables, $1\frac{1}{2}$ in. short linked.
- XX. Mushrooms by Robert Mallett, Dublin; cables by Wood and Brothers, Liverpool.
- XXI. Main lantern 36 feet, fore lantern 26 feet, mizen lantern 24 feet.
- XXII. Height of the eye above the sea 10 feet, distance of sea horizon about 3.65 miles.
- XXIII. $11\frac{1}{2}$ nautical miles.
- XXIV. Three fixed lights, colour white.
- XXV. None.
- XXVI. From sunset to sunrise.
- XXVII. Catoptric.
- XXVIII. Eight burners in each lantern, total 24; diameter of reflectors, 12 inches.
- XXIX. None.
- XXX. Wilkins, Long Acre, London.
- XXXI. Lanterns are suspended by chain ties rove through cheek blocks each side of the mast head. Lamps and their reflectors are suspended on gimbals to a traversing frame.
- XXXII. By a gong.
- XXXIII. Twenty-four days.
- XXXIV. Twenty-four days.
- XXXV. Contract, 3,651*l.* Sheathing, 283*l.* 12*s.* 9*d.*
- XXXVI. 6,767*l.* 12*s.* 8*d.*
- XXXVII. Ordinary, 534*l.* 7*s.* 8*d.*
Extraordinary, 294*l.* 12*s.* 10*d.*
- XXXVIII. One master, one mate, three lamp-lighters, six seamen; total, 11.
- XXXIX. Master, 7*l.* per month; mate, 5*l.*; lamp-lighters, 2*l.* 17*s.* 2*d.*; seamen, 2*l.* 11*s.* 8*d.* each. Mates appointed since 1853 receive but 4*l.* per month.
- XL. Eleven persons at 1*s.* 3*d.* per day each; total, 250*l.* 18*s.* 9*d.* per annum.
- XLI. The crew receive 1*s.* 3*d.* per day each, and provide their own provisions.
- XLII. Wood and Co., chains 508*l.* 11*s.* 11*d.*; anchor and do. 95*l.* 9*s.* 3*d.*
- XLIII. W. Wilkins, London, 1,215*l.*
- XLIV. 1857, 11*l.* 1*s.* 6*d.*; 1858, 15*l.* 3*s.* 9*d.*
- XLV. Consumption of oil for 1857, 648 gallons
" " " 1858, 658 gallons.
" " " of wicks, 1857, 15 gross and 2 dozen.
" " " " 1858, 10 gross.
- XLVI. Rape oil used in 1857 at 4*s.* 2*d.* per gallon; total annual cost, 136*l.* 7*s.* 0*d.*
Rape oil used in 1858 at 3*s.* 5*d.* per gall., 112*l.* 8*s.* 2*d.*
- XLVII. Cotton wick used in 1857, at 4*s.* 6*d.* per gross; total annual cost, 31*l.* 8*s.* 3*d.*
Cotton wick used in 1858, at 3*s.* 6*d.* per gross; total annual cost, 1*l.* 15*s.*
- XLVIII. The gong cost 6*l.*
- XLIX. Mercantile Marine Fund, payable into Ballast Office.

- L. June 1852, 1,074*l.* 18*s.* 10*d.*; June 1858, 829*l.* 0*s.* 11*d.*; total for year 1852, 4,299*l.* 15*s.* 4*d.*
- LI. 1852, 449*l.* 10*s.* 3*d.* 1858, 1,302*l.* 18*s.* 8*d.* This includes all attendance of vessels and carriage of stores.
- LII. None.
- LIII. None.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. None.
- LVIII. The Lighthouse Committee and Marine Inspector to Board.
- LIX. May 19, 1857; May 15, 1858, June 25, 1858; September 29, 1858.
- LX. No.
- LXI. Parted her chain in a heavy gale of wind on the night of December 27, 1852, was brought up by her spare mushroom and chain, but out of her position. Replaced on 30th December 1852.
- LXII. None supplied.
- LXIII. No life-boat is attached to the ship, and never has been the custom; her own boats are, however, to some extent available.
- LXIV. Have no code, but the lightvessel has rockets and blue lights on board, which burnt every quarter of an hour at night, are a signal to the life-boat at Kingstown that a vessel is on the bank.
- LXV. No (tide) signal is exhibited from this vessel, as there is a tide light shown at the entrance of the river and harbour of Dublin.
- LXVI. The master and mate have leave alternately month about. Two of the crew have leave monthly.
- LXVII. The vessel's stores are carried by the buoy tender. Provisions and water for the crew by the contract attending boat from Kingstown on the 1st, 10th, and 20th of the month. The liberty men are conveyed by the attending boat.
- LXVIII. Yes, at Dublin; she is in every respect ready for the sea. A contract exists with a steam packet company in Dublin to supply a steamer to tow her to her station. The delay would depend whether there was a steamer in the Port available for this purpose.
- LXIX. Rules and regulations herewith sent.

Index Map 35.

ARKLOW BANK FLOATING LIGHT.

- I. The "Relief." Moored off the south-west end of the Arklow Bank, coast of Wicklow.
- II. Depth of water, 22 $\frac{1}{2}$ fathoms. Bottom, hard sand and shells. Maximum force of tide, $2\frac{1}{2}$ knots.
- III. Port of Dublin Corporation.
- IV. No agent employed.
- V. July 1823, by merchants of Waterford.
- VI. To mark the south end of the Arklow Bank, and as a guide for vessels passing up and down between the Arklow Bank and the main.
- VII. Since March 1825.
- VIII. One light only is exhibited from the mainmast.
- IX. Length overall, 77 feet; length of keel, 71 feet; breadth, 20 feet; depth of hold, 10 feet 2 inches.
- X. Built of British oak.
- XI. 126 tons.
- XII. Built at Milford in 1826 by William Roberts.
- XIII. Aft, 8 feet 5 inches; forward, 6 feet 7 inches.
- XIV. Black, with a white streak.
- XV. Carries a ball at her mainmast-head, and has "Arklow" in white letters on her sides.
- XVI. Has three masts, a fore staysail, four lug, mainstay sail, and gaff mizen.
- XVII. Has long copper wire lightning conductor from main truck to water.
- XVIII. Rides by a mushroom anchor and 220 fathoms of chain, has a spare chain of 200 fathoms and a spare mushroom.
- XIX. Mushroom, 38 cwt.; riding chain, $1\frac{1}{2}$ inches; spare chain, $1\frac{1}{2}$ inches.
- XX. Chains by Wood, Brothers, Liverpool; mushrooms by Clason and Co., Dublin.
- XXI. Thirty-four feet.
- XXII. Height of the eye, 9 feet; sea horizon distant 3.4 miles.
- XXIII. $11\frac{1}{2}$ miles.
- XXIV. Fixed.
- XXV. None.
- XXVI. Sunset to sunrise.

FLOATING LIGHTS—(SPECIAL RETURNS).

IRELAND.
Circular IV.

Index Map 36.

BLACKWATER BANK FLOATING LIGHT.

- XXVII. Catoptric.
- XXVIII. Sixteen burners in one lantern. Reflectors, 12 inches in diameter.
- XXIX. None.
- XXX. Lantern now in use made by Wilkins, London, in 1840. Lantern first supplied by Swan and Co., London, 1826.
- XXXI. Lanterns are suspended by chain ties rove through cheek blocks each side of the masthead. Lamps and reflectors are suspended on gimbals to a traversing frame.
- XXXII. By a gong.
- XXXIII. Nine days.
- XXXIV. Nine days.
- XXXV. 2,028*l.* 13*s.* 11*d.*
- XXXVI. 4,670*l.* 11*s.*
- XXXVII. Ordinary, 610*l.* 0*s.* 7*d.*
Extraordinary, 294*l.* 12*s.* 10*d.*
- XXXVIII. One master, one mate, three lamplighters, six seamen; total 11.
- XXXIX. Master, 7*l.*; mate, 4*l.*; lamplighters, 2*l.* 17*s.* 2*d.*; seamen, 2*l.* 11*s.* 8*d.*, each per month.
- XL. Eleven persons at 1*s.* 3*d.* per day; total, 250*l.* 18*s.* 9*d.* per annum.
- XLI. The crew receive 1*s.* 3*d.* per day, and provide their own provisions.
- XLII. 572*l.*
- XLIII. Year 1840, Wilkins and Son, 703*l.* 9*s.* 2*d.*
- XLIV. 1857, 8*l.* 8*s.*; 13*l.* 12*s.* 6*d.* in 1858.
- XLV. Consumption of oil for 1857, 449 gallons.
" " 1858, 461 gallons.
" " wicks for 1857, 14 gross 6 dozen.
" " 1858, 13 gross 8 dozen.
- XLVI. Rape oil used in 1857, at 4*s.* 2½*d.* per gallon; total annual cost, 94*l.* 9*s.* 6½*d.*
Rape oil used in 1858, at 3*s.* 5*d.* per gallon; total annual cost, 78*l.* 15*s.* 1*d.*
- XLVII. Cotton wick used in 1857, at 4*s.* 6*d.* per gross; total annual cost, 3*l.* 5*s.* 3*d.*
Cotton wick used in 1858, at 3*s.* 4*d.* per gross; total annual cost, 2*l.* 7*s.* 10*d.*
- XLVIII. Gong cost 6*l.*
- XLIX. Mercantile Marine Fund, payable into Ballast Office.
L. June 1852, 866*l.* 13*s.* 7*d.*; June 1858, 764*l.* 5*s.* 8*d.*; total for year 1852, 3,466*l.* 14*s.* 2*d.*
LI. 1852, 945*l.* 5*s.* 6*d.*; 1858, 1,298*l.* 18*s.* 10*d.*
- LII. None.
- LIII. None.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. None.
- LVIII. By Lighthouse Committee and Marine Inspector to Board.
- LIX. May 6, 1857; September 28, 1857; October 14, 1857; May 4, 1858; September 25, 1858.
- LX. No.
- LXI. No.
- LXII. None supplied.
- LXIII. No life-boat is attached to the ship, and never has been the custom, the number of the crew being limited; her own boats are, however, to some extent available.
- LXIV. Have no code, but the lightvessel has rockets and blue lights on board, which, burnt every quarter of an hour at night, are a signal to the life-boat at Arklow that a vessel is on the bank.
- LXV. No tide light is exhibited from this vessel as there is no tidal harbour in the vicinity.
- LXVI. The master and mate have leave alternately month about. Two of the crew have leave monthly.
- LXVII. The vessel's stores are carried by the buoy tender. Provision and water for the crew by the contract attending boat from Arklow on the 1st, 10th, and 20th of the month. The liberty men are conveyed by the attending boat.
- LXVIII. Yes, at Dublin. She is in every respect ready for sea. A contract exists with a steam packet company in Dublin to supply a steamer to tow her to her station. The only delay would depend on whether there was any steamer in Dublin available for this purpose.
- LXIX. Rules and regulations herewith sent.

- I. "Brilliant." Moored off the north end of the Blackwater Bank.
- II. Depth of water, 2½ fathoms. Bottom, sand, gravel, and coarse shells. Maximum force of tide, 2½ knots.
- III. Port of Dublin Corporation.
- IV. No local agent employed.
- V. November 1844, by the shipowners of Liverpool.
- VI. To warn vessels of a very dangerous bank, on which many accidents had previously occurred to vessels onward bound from the northward.
- VII. First placed the 14th October 1857.
- VIII. Two lights are shown from this vessel, the highest from the mainmast is a bright revolving light 39 feet above the water, the lower light from the foremast is a fixed bright light at a height of 26 feet above the water.
- IX. See builder's specification herewith sent.
- X. See builder's specification herewith sent.
- XI. 163 tons.
- XII. At Cork, by Joseph Wheeler.
- XIII. Draught forward, 7 feet; draught aft, 8 feet 6 inches.
- XIV. Black, with a white streak.
- XV. Carries a ball at the fore and mainmast head, and has "Blackwater" painted on her sides.
- XVI. Has three masts, a fore stay-sail, a lug foresail, a mainstay sail, and a gaff mizen.
- XVII. One from the main truck to the water, and one from the fore and mizen trucks to the eyes of the chain rigging. The chain plates have copper bands, quarter inch by two inches, attached to them, which bands reach to the 6 feet water line.
- XVIII. Moored with a mushroom anchor, and 220 fathoms of chain cable. Has a spare mushroom at the bows, and 220 fathoms of spare chain.
- XIX. Riding mushroom, 44 cwt., spare mushroom, 38 cwt.; riding chain, 220 fathoms, 1½ inches; spare chain, 220 fathoms, 1½ inches.
- XX. Brown and Lennox, Millwall, London.
- XXI. Revolving light, 39 feet; fixed light, 26 feet.
- XXII. Height of eye above the sea, 10 feet; distance of sea horizon about 3·65 miles.
- XXIII. About 12 nautical miles.
- XXIV. Fixed and revolving, colour white.
- XXV. The revolving light attains its greatest brilliancy once in every minute.
- XXVI. From sunset to sunrise.
- XXVII. Catoptric.
- XXVIII. The revolving light has 4 argand burners. The fixed light has eight argand burners. Reflectors, 12 inches in diameter.
- XXIX. None.
- XXX. Fixed light by Edmundson and Co., Dublin. Revolving light by Chance and Sons, Birmingham.
- XXXI. Lanterns are suspended by chain ties rove through cheek blocks each side of the masthead. Lamps and their reflectors are suspended on gimbals to a traversing frame.
- XXXII. By a gong.
- XXXIII. Eleven days.
- XXXIV. Eleven days.
- XXXV. Contract, 3,200*l.* Sheathing, 354*l.* 1*s.* 7*d.*
- XXXVI. 6,202*l.* 5*s.* 6*d.*
- XXXVII. Ordinary expenditure for one year, 589*l.* 18*s.* 5*d.*
Extraordinary expenditure for one year, nil; a new vessel first placed in 1857.
- XXXVIII. One master, one mate, three lamplighters, six seamen; total 11.
- XXXIX. Master, 7*l.*; mate, 4*l.*; lamplighter, 2*l.* 17*s.* 2*d.*; seamen, 2*l.* 11*s.* 8*d.* each per month. Mates appointed since 1853 receive but 4*l.* per month.
- XL. Eleven persons at 1*s.* 3*d.* per day each; total per annum, 250*l.* 18*s.* 9*d.*
- XLI. The crew receive 1*s.* 3*d.* per day each, and provide their own provisions.
- XLII. 636*l.* 8*s.*
- XLIII. Revolving light and apparatus, 560*l.* 7*s.* 11*d.*; fixed light, 315*l.* 8*s.*
- XLIV. First placed 14th October 1857. 1858, 8*l.* 4*s.* 9*d.*
- XLV. Consumption of oil in 1857, 120 gallons.
" " 1858, 8·6 gallons.
" " wicks, in 1857, 2 gross 3 dozen.
" " 1858, 6 gross 2 dozen.

FLOATING LIGHTS—(SPECIAL RETURNS).

- IRELAND.
Circular IV.
- XLVI. Rape oil used in 1857, at 4s. 2½d. per gallon; total cost, 25l. 5s.
Rape oil used in 1858, at 3s. 5d. per gallon; total cost for year, 65l. 18s. 10d.
- XLVII. Cotton wick used in 1857, at 4s. 6d. per gross; total cost, 10s. 1½d.
Cotton wick used in 1858, at 3s. 6d. per gross; total cost for year, 1l. 1s. 7d.
- XLVIII. Gong cost 6l.
- XLIX. Mercantile Marine Fund, payable into Ballast Office, Dublin.
- L. Not lighted in 1852. June 1858, 771l. 6s. 4d.
LI. 1852, nil. 1858, 1,326l. 11s. 4d., including all attendance of boats, vessels, and carriage of stores.
- LII. None.
LIII. None.
LIV. None.
LV. None.
LVI. None.
LVII. None.
LVIII. By Lighthouse Committee and Marine Inspector to Board.
- LIX. (First placed October 14, 1857.) May 4, 1858; September 28, 1858.
- LX. No.
LXI. No.
LXII. None supplied.
- LXIII. No life-boat is attached to the ship, and never has been the custom; her own boats are, however, to some extent available.
- LXIV. Have no code, but the light vessel has rockets and blue lights on board, which, burnt every quarter of an hour at night, are a signal to the life-boat at Cahore that a vessel is on the bank.
- LXV. No tide light is exhibited, as there is no tidal harbour in the vicinity of this light.
- LXVI. The master and mate have leave alternately month about. Two of the crew have leave monthly.
- LXVII. The vessel's stores are carried by the buoy tender. Provision and water for the crew by the contract attending boat from Courtown the 1st, 10th, and 20th of the month. The liberty men are conveyed by the attending boat.
- LXVIII. Yes, at Dublin. She is in every respect ready for sea; a contract exists with a steam packet company in Dublin to supply a steamer to tow her to her station. The delay would depend whether there was a steamer in Dublin available for this purpose.
- LXIX. Rules and regulations herewith sent.
- XIX. The mushroom she rides by is 44 cwt.; the chain 200 fathoms of 1½". The spare anchor is a common anchor, with an iron stock of 22 cwt.; spare chain, 220 fathoms of 1½".
- XX. Chains by Wood and Brothers, Liverpool.
- XXI. Main light, 38 feet 6 inches; fore light, 27 feet 6 inches.
- XXII. Height of eye above the sea, 10 feet; distance of sea horizon about 3·65 miles.
- XXIII. About 12 miles.
- XXIV. Two fixed lights, colour white.
- XXV. None.
- XXVI. From sunset to sunrise.
- XXVII. Catoptric.
- XXVIII. Eight burners in each lantern; total, 16 burners. Diameter of reflectors, 12 inches.
- XXIX. None.
- XXX. Wilkins, Long Acre, London.
- XXXI. Lanterns are suspended by chain tyes rove through cheek blocks each side of the masthead. Lamps and their reflectors are suspended on gimbals to a traversing frame.
- XXXII. By a gong.
- XXXIII. Eight days.
- XXXIV. Eight days.
- XXXV. Contract, 3,800l. Sheeting, 348l. 12s. 2d.
- XXXVI. 7,257l. 17s. 11d.
- XXXVII. Ordinary, 610l. 12s. 7d.
Extraordinary, 294l. 12s.
- XXXVIII. One master, one mate, three lamp-lighters, seven seamen; total 12.
- XXXIX. Master, 7l. per month; mate, 4l.; lamp-lighters, 2l. 17s. 2d.; seamen, 2l. 11s. 8d.
- XL. Twelve persons at 1s. 3d. per day each; total, 273l. 15s.
- XLI. The crew receive 1s. 3d. per day each, and provide their own provisions.
- XLII. 635l. 12s. 8d.
- XLIII. W. Wilkins, 1,191l. 14s. This includes a spare lantern besides the two in use.
- XLIV. 1857, 10l. 12s. 11d.; 1858, 8l. 3s.
- XLV. Consumption of oil in 1857, 449 gallons.
" " 1858, 470 gallons.
" " wicks in 1857, 8 gross.
" " 1858, 9 gross.
- XLVI. Rape oil used in 1857; total annual cost, at 4s. 2½d. per gallon, 94l. 9s. 6½d.
Rape oil used in 1858; total annual cost, at 3s. 5d. per gallon, 80l. 5s. 10d.
- XLVII. Cotton wick used in 1857; total annual cost, at 4s. 6d. per gross, 1l. 16s.
Cotton wick used in 1857; total annual cost, at 3s. 6d. per gross, 1l. 12s. 4½d.
- XLVIII. Gong cost 6l.
- XLIX. Mercantile Marine Fund, payable into Ballast Office, Dublin.
- L. June 1832, 814l. 13s. 2d. June 1858, 735l. 16s. 5d.; total for year 1852, 3,258l. 12s. 6d.
- LI. 1852, 926l. 9s. 8d. 1858, 1,354l. 14s. 10d., including all attendance of vessel and carriage of stores.
- LII., LIII., LIV., LV., LVI., LVII. None.
- LVIII. By Lighthouse Committee and Marine Inspector to Ballast Board.
- LIX. May 6, 1857; September 28, 1857; May 5, 1858; August 29, 1858; September 28, 1858.
- LX. No.
LXI. No.
LXII. None.
- LXIII. No life-boat is attached to the ship, and never has been the custom; her own boats are, however, to some extent available.
- LXIV. Have no code, but the light vessel has rockets and blue lights on board, which, burnt every quarter of an hour at night, are a signal to the life-boat at Kilmore that a vessel is on the rocks.
- LXV. No tide light is exhibited, as there is no tidal harbour in the vicinity.
- LXVI. The master and mate have leave alternately month about; two of the crew have leave monthly.
- LXVII. The vessel's stores are carried by the buoy tender; provision and water for the crew by the contract attending boat from Kilmore the 1st, 10th, and 20th of the month. The liberty men are conveyed by the attending boat.
- LXVIII. Yes, at Dublin. She is in every respect ready for sea; a contract exists with a steam packet company in Dublin to supply a steamer to tow her to her station. The only delay would depend on whether there was any steamer in the Port of Dublin available for this purpose.
- LXIX. Rules and regulations herewith sent.

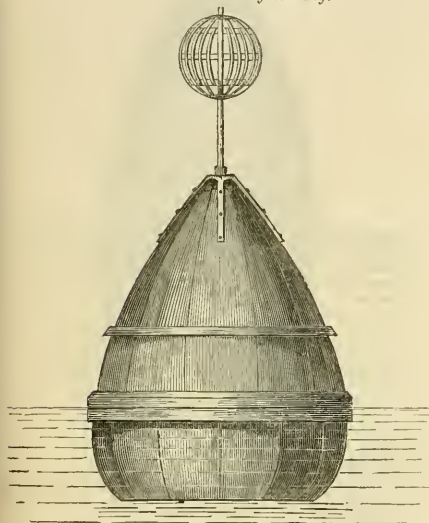
Index map 37.

CONINGBEG FLOATING LIGHT.

- I. "Petrel." Moored off the Coningbeg Rock, near the Saltee Islands, coast of Wexford.
- II. Depth of water, 30 fathoms. Bottom, fine sand. Maximum strength of tide, 2 knots.
- III. Port of Dublin Corporation.
- IV. No local agent employed.
- V. March 1821, by the Chamber of Commerce, Waterford.
- VI. To guard vessels from the Coningbeg and other half-tide rocks lying to the southward of the Saltee Islands.
- VII. Since August 1824.
- VIII. Two fixed bright lights are exhibited from this vessel; the higher from the mainmast at a height of 38 feet 6 inches above the water, the lower light from the foremast at a height of 27 feet 6 inches above the water.
- IX. See builder's specification herewith sent.
- X. See builder's specification herewith sent.
- XI. 163 tons.
- XII. Built at Blackwall by Money Wigram and Sons.
- XIII. Draught of water forward, 7 feet 6 inches; aft, 8 feet 6 inches.
- XIV. Black, with a white streak.
- XV. Carries a ball at her mainmast head, has "Coningbeg" in white letters painted on her sides.
- XVI. Has three masts, a fore staysail, fore lug, mainstay sail, and mizen lug.
- XVII. One from the main truck to the water, and one from the mizen truck and fore truck to the eyes of the chain rigging. The chain and plate have copper bands a quarter inch by two inches attached to them, which bands reach to the 6 foot waterline.
- XVIII. Moored with a mushroom anchor and 200 fathoms of 1½ chain; has a spare anchor of 22 cwt., and 220 fathoms of 1½ spare chain.

CIRCULAR No. V.—BUOYS AND BEACONS.

- I. Port of Dublin Corporation.
 II. A chart is herewith furnished, showing the position of all buoys under the management of the Port of Dublin Corporation forming one district. For jurisdiction of Port of Dublin Corporation, see Merchant Shipping Act, 17 & 18 Vict., Part VI., Sect. 394.
 The Corporation do not levy tolls on shipping or otherwise for buoys, therefore no income is derived from them.
 III. The Board of Trade and Elder Brethren of the Trinity House.
 IV. Vide Merchant Shipping Act, Part VI., Sect. 394.
 V. CLASS A.—No. 1.
Herbert's Patent.—9 feet Buoy.

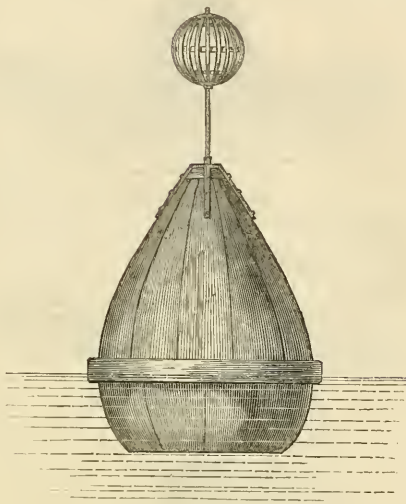
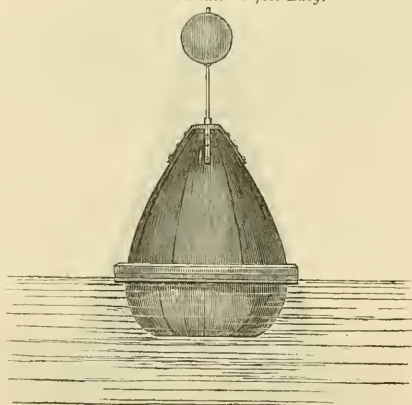
Scale $\frac{1}{4}$ inch = 1 foot.

- a. Iron.
 b. 99*l.* 4*s.*
 c. This class of buoy was first placed in 1857, since when it has had no repair, except for a new beacon, cost of which 2*l.* 10*s.*
 d. 5*l.* 5*s.*
 e. One.
 f. One.
 g. One at H.M. Dockyard, Hawiboline, Queenstown.
 h. One.
 i. One at Dant Rock, 26th April 1858.
 j. Sunk, supposed to have been run into.
 k. 30 fathoms of $1\frac{1}{2}$ inch chain, 30 cwt. sinker.
 l. 31*l.*
 m. These buoys are to be procured only from Brown and Lennox, at a fixed price, being patent. All moorings are procured from Brown and Lennox at prices fixed by Trinity Board.
 n. None, excepting by its colour, and the staff and globe, and the name of the rock it marks painted on it.
 o. One.

CLASS A.—No. 2.
Herbert's Patent.—8 feet Buoy.

- a. Iron.
 b. 85*l.* 4*s.* 6*d.*
 c. Buoys of this class were first procured in 1857, since when they have cost nothing for repairs, except for beacons, which cost about 2*l.* 10*s.* annually.
 d. 4*l.* 15*s.*
 e. Two.
 f. One.
 g. One at Ballast Office Stores, Dublin.
 h. One.
 i. None.
 k. $1\frac{1}{2}$ inch chain, 24 cwt. sinker.
 l. 26*l.*
 m. To be procured only from Brown and Lennox, at fixed prices, as being under patent. All moorings are procured from Brown and Lennox at prices fixed by Trinity Board.
 n. By the beacon, by its colour, and by the name on it.
 o. Two.

IRELAND.
 Circular V.
 Question V.

Scale $\frac{1}{4}$ inch = 1 foot.CLASS A.—No. 3.
Herbert's Patent.—6 feet Buoy.Scale $\frac{1}{3}$ inch = 1 foot.

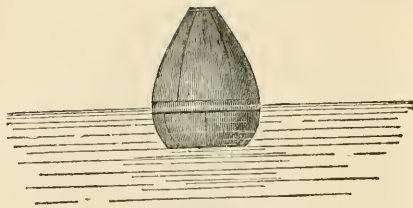
- a. Iron.
 b. 35*l.* 4*s.*
 c. First placed in 1858, has had no repair.
 d. 4*l.*
 e. Two.
 f. Three.
 g. One at Killybegs, one at Ballast Office Stores, Dublin, one at South Arran Island.
 h. Two.
 i. One in December 1858.
 j. Dragged its moorings during a heavy gale.
 k. 1 inch chain, 16 cwt. sinkers.
 l. 17*l.* 10*s.*
 m. These buoys can only be procured from Brown and Lennox, being under patent. All moorings are procured from Brown and Lennox at prices fixed by Trinity Board.
 n. Beacon and colour, with name painted on it.
 o. Two.

CLASS A.—No. 4.
Herbert's Patent.—4 feet Buoy.

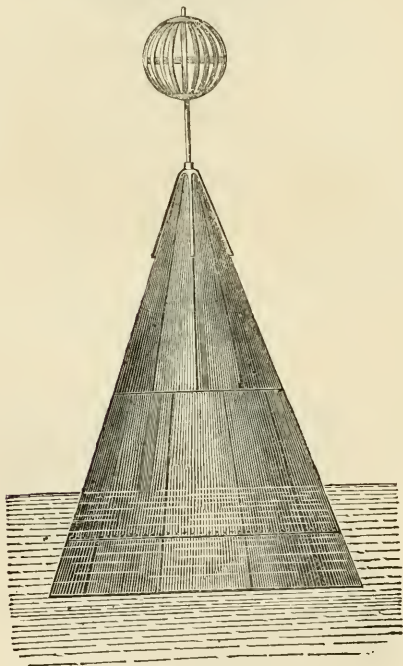
- a. Iron.
 b. 22*l.*
 c. First placed in 1858; cost for repair in 1859, 1*l.* 5*s.*
 d. 2*l.* 10*s.*
 e. One at Valentia.
 f. One.

IRELAND.

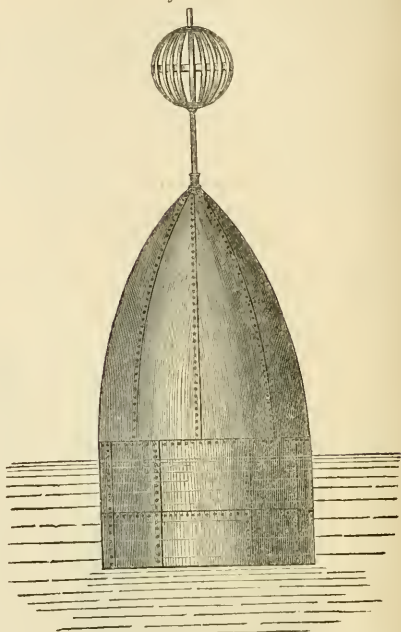
V.

Circular V.
Question V.Scale $\frac{1}{4}$ inch=1 foot.

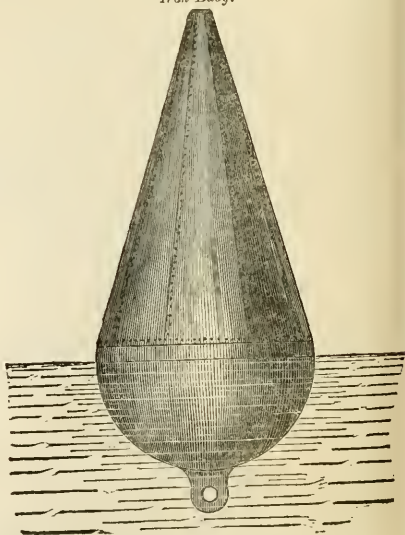
- g. One at Knightstown, Valentia.
 h. One.
 i. None; first placed in October 1858.
 k. $\frac{7}{8}$ inch chain, 8 cwt. sinker.
 l. 12l. 3s.
 m. Buoys of this class procured from Brown and Lennox only, being under patent. All moorings are procured from Brown and Lennox at prices fixed by Trinity Board.
 n. None, except colour and name of danger it marks.
 o. None, except name.

CLASS B.—No. 1.
Stoney's Patent.Scale $\frac{1}{4}$ inch=1 foot.

- a. Iron.
 b. 44l. 10s.
 c. First placed in 1853, has required no repair, except a beacon, cost of which is 2l. 10s.
 d. 5l.
 e. One at Codling Bank.
 f. One.
 g. One at Ballast Office Stores, Dublin.
 h. One.
 i. None.
 k. $1\frac{1}{2}$ inch chain, 30 cwt. sinker.
 l. 3l.
 m. Procured by open tender. All moorings are procured from Brown and Lennox at prices fixed by Trinity Board.
 n. By a beacon, its colour, and name of rock.
 o. One.

CLASS B.—No. 2.
Stoney's Patent.Scale $\frac{1}{4}$ inch=1 foot.

- a. Iron.
 b. 44l. 10s.
 c. to j. None of these buoys have yet been placed; t is intended to place two to mark the outer edge of Arklow Bank.
 k. $1\frac{1}{2}$ inch chain, 30 cwt. sinker.
 l. 3l.
 m. Will be procured by open tender.
 n. By the beacon, colour and name.
 o. None.

CLASS C.—No. 1.
Iron Buoy.Scale $\frac{1}{4}$ inch=1 foot.

V.

BUOYS AND BEACONS.

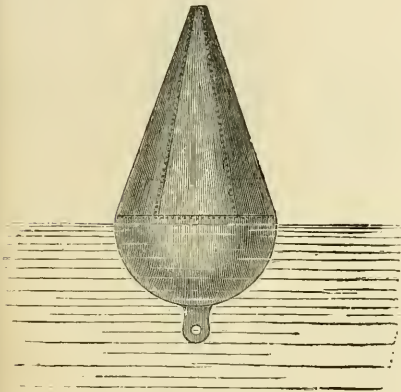
V.

IRELAND.
Circular V.
Question V.

- a. Iron.
- b. 42*l.* 10s
- c. Buoys of this class were first procured in 1850, and have never required repair, except from being run into; a new shackle is required about every three years, cost 1*l.* 10s.
- d. 5*l.*
- e. Five.
- f. Seven.
- g. Two at Donaghadee one at Hawlboline, four at Ballast Office Stores, Dublin.
- h. Seven.
- i. None.
- k. 1½ inch chain, 30 cwt. sinker.
- l. 31*l.*
- m. Procured by open tender. Moorings procured from Brown and Lennox at prices fixed by Trinity House. Any repairs required for these buoys would be done by contractor for repairing boiler work.
- n. Two buoys of this class have beacons; all are lettered.
- o. Two.

- a. Iron.
- b. 26*l.*
- c. None of this class have been repaired for 10 years, except those damaged by accident. New shackle every third year, cost 1*l.* 1s.
- d. 2*l.* 10s.
- e. Ten.
- f. Ten.
- g. One at Dublin Store, one at Kinsale, one at Glendore, two at Baltimore, one at Bearhaven, two at Foynes, one at Bunerana, and one at Donaghadee.
- h. Ten.
- i. None.
- j. None.
- k. 1½ inch chain, 16 cwt. sinker.
- l. 21*l.*
- m. Procured by open tender, repaired by contractor for boiler work.
- n. None, except colour.

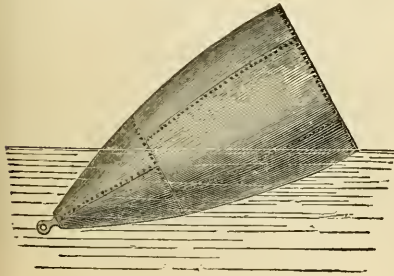
CLASS C.—No. 2.
Iron Buoy.



Scale ¼ inch = 1 foot.

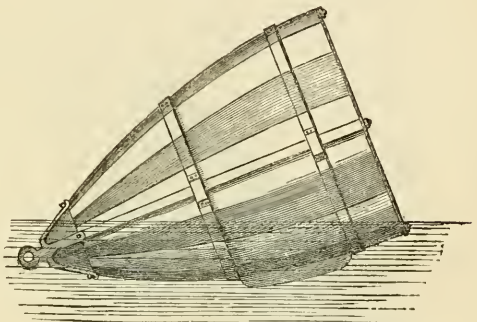
- a. Iron.
- b. 22*l.* 8s.
- c. Buoys of this class were first placed in 1850, none have required repair, except those run into by accident; new shackle required every three years, cost 1*l.* 1s.
- d. 4*l.*
- e. Eight.
- f. Nine.
- g. Six at Stores, Dublin, two at Donaghadee, one at Inishgort Lighthouse.
- h. Eight.
- i. None.
- k. 1½ inch chain, 24 cwt. sinker.
- l. 21*l.*
- m. Procured by open tender, repairs if required would be done by contractor for boiler work.
- n. None, except name of danger it marks.
- o. All are lettered.

CLASS D.—No. 4.
Iron Buoy.



Scale ¼ inch = 1 foot.

CLASS D.—No. 1.
Timber Buoy.



Scale ¼ inch = 1 foot.

- a. Wood.
- b. 62*l.*
- c. These buoys require hooping about every eight years, cost about 15*l.*; a new shackle every third year, cost 1*l.* 10s.
- d. 4*l.* 5s.
- e. Eight.
- f. Nine.
- g. Eight at Ballast Office Store, Dublin, one at Larne Lighthouse.
- h. Eight.
- i. None.
- k. 1½ inch chain, 34 cwt. sinker.
- l. 35*l.*
- m. These buoys can only be obtained from one person in Dublin, no other party can make them; his charge has been always the same for many years.
- n. Beacons have been placed on these buoys, but as they were constantly knocked off by the sea, they have been discontinued except in one case.
- o. One at the north end of the Arklow Bank, all are lettered.

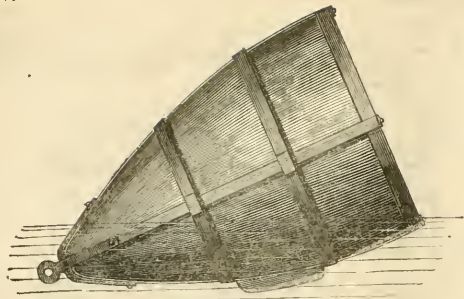
CLASS D.—No. 2.
Timber Buoy.

- a. Wood.
- b. 52*l.* 10s.
- c. Require new hooping once every eight years, cost about 10*l.*; a new shackle every three years, cost 1*l.* 5s.
- d. 3*l.* 15s.
- e. Four.
- f. Four.
- g. One at Galway, three at Ballast Office Stores, Dublin.
- h. Four.
- i. None.
- k. 1½ inch chain, 30 cwt. sinker.
- l. 31*l.*

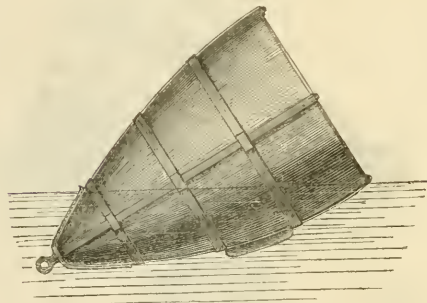
IRELAND.

Circular V.
Question V.

V.

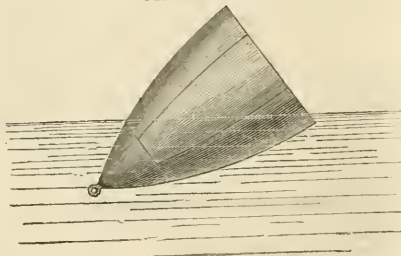
Scale $\frac{1}{4}$ inch = 1 foot.

- m. These buoys are only to be obtained from one person in Dublin, charge has been the same for many years.
n. None except by colour and name.
o. Four.

CLASS D.—No. 3.
Timber Buoys.Scale $\frac{1}{4}$ inch = 1 foot.

- a. Wood.
b. 32l.
c. Required new hooping about every eight years, cost 7l.; new shackle every three years, cost 1l.
d. 3l. 3s.
e. Four.
f. Four.
g. Four at Ballast Office Stores, Dublin.
h. Four.
i. Two.
j. One run into and sunk, one dragged its mooring in a heavy gale.
k. $1\frac{1}{4}$ inch chain, 24 cwt. sinker.
l. 26l.
m. Procured in same manner as No. 1 and 2 of this class.
n. None, except by colour and name.
o. Four.

CLASS D.—No. 5.

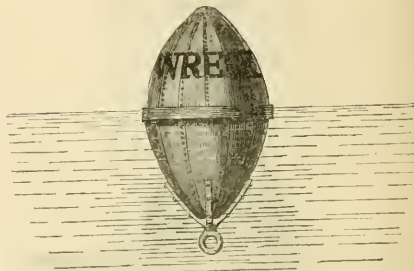


BUOYS AND BEACONS.

- a. Iron.
b. 11l. 11s.
c. Require repairing about once in eight or 10 years.
d. 2l.
e. Seven.
f. Six.
g. One at Killibegs, five at Foynes.
h. Four.
i. None.
k. 1 inch chain, 8 cwt. sinker.
l. 15l. 10s.
m. By open tender.
n. None, except colour.
o. None.

CLASS D.—No. 6.

Iron Buoy.

Scale $\frac{1}{4}$ inch = 1 foot.

- a. Iron.
b. 16l.
c. None of these buoys have yet required repairs.
d. Two.
e. Two.
f. Ballast Office Stores, Dublin.
g. Two.
h. 2l.
i. None.
k. $\frac{3}{4}$ inch chain, 8 cwt. sinker.
l. 13l.
m. Buoys of this class were procur'd from Messrs. Brown and Lennox, at a fixed price, 16l. each.
n. Colour green, with the word "Wreck" on it.
o. Two.

VI. Of the descriptions of buoys at present used by the Corporation that of Herbert's is the most approved, both for tideways and exposed situations. A buoy, lately patented by B. B. Stoney, of Dublin, is also an excellent sea mark, and rides well on tide-ways, but it has not been sufficiently tested in the most exposed situations to speak with confidence of its merits.

VII. All buoys on the north, east, and south coast of Ireland are shifted by the buoy tender every six months, and brought in for examination and painting. Buoys on the west coast are shifted by the buoy tender once a year during the summer, but are cleaned and painted at their moorings in the winter, if they require it, which is done by persons resident in their vicinity, who are employed for that purpose when necessary.

VIII. Wooden buoys are surveyed by planing and boring their staves to ascertain their soundness; should any stave be found to be defective, an estimate for the necessary repairs is obtained from a cooper, and should his estimate be considered moderate and the buoy worth the expense of repairing, it is done. Iron buoys seldom require repairs except they have been run into; any repairs they might require would be done by the contractor for boiler work on stipulated terms, according to days work and material used. Iron buoys when brought in are examined by competent persons, internally and externally.

BUOYS AND BEACONS.

IRELAND.
Circular V.

- IX, X. Vide returns as to beacons.
 XI. In all cases where dangers are for the first time to be marked by buoys the most approved descriptions are now adopted, except where there may be other buoys in the vicinity, and where a marked distinction of character is requisite; this necessitates the introduction of different buoys: since 1857, six of Herbert's, six egg-bottomed, and one of Stoney's have been introduced.
 XII. By direction of the Trinity House, in their letter of 10 November 1859, harbour rivers and channels are in future to be marked by either black or red buoys on the starboard hand when entering from the sea, and on the port hand by buoys of the same colour as those on the starboard hand, with the addition of a white belt; and middle dangers to be marked by white buoys surmounted by a black beacon. Hitherto the Corporation, when marking rivers and harbours, have in most cases placed black buoys on the starboard hand and red on the port.
 XIII. Vide returns as to beacons.
 XIV. The Mercantile Marine Fund, paid into the Ballast Office, Dublin.
 XV. Vide returns as to beacons.
 XVI. Income, nil.

The total expenditure in 1852 for 38 buoys was 1,382*l.* 18*s.* 6*d.*
 The total expenditure in 1858 for 54 buoys was 2,777*l.* 2*s.**

- XVII, XVIII. Galway Harbour Commissioners apply to have a bell buoy or lightship placed to mark St. Margaretta Rock, September 1858. Ballast Office strongly recommend same to Board of Trade, September 1858. Board of Trade refuse to sanction on the grounds that it would be altogether for local purposes, October 1858.

The Knight of Kerry, on the part of certain parties in Valentia, applies to have that harbour marked by buoys, October 1858. The Board refused to sanction on the ground that the benefit derived would be purely local, October 1858.

Captain Crispin applies for a buoy to mark the Maiden Rock, Kennamer river, November 1858. Board of Trade refuse to sanction, being purely local, December 1858.

Earl of Leitrim applies to have "Mulroy Harbour" marked, February 1859. Ballast Office request to be furnished with a return of the shipping frequenting that harbour.—(Return not yet furnished.)

Board of Trade forward letter from Admiralty requesting that buoys be placed to mark certain dangers in Berehaven, February 4, 1859.

This Board approve of same being marked, and recommend same to Trinity House, who approve thereof, March 1859.

Board of Trade suggests that as the place is used chiefly by Her Majesty's ships, two-thirds of the expense of marking it should be borne by the Admiralty.

Board of Trade subsequently state that having been in communication with the Admiralty, that

department is not prepared to sanction the expense thereof, and under the circumstances they cannot allow the cost to be borne by the Mercantile Marine Fund, July 28, 1859.

Master of S.S. "Calypso" applies for two additional buoy on the Arklow Bank, September 1859. Ballast Board approve, October 1859. Trinity Board acquiesce, November 1859. Board of Trade sanction, November 15, 1859.

Ballast Office recommend buoy to mark "Brigg's Rock," Belfast Lough, September 1859. Still under consideration of Trinity Board, 1860.

Wicklow Harbour Commissioners apply for buoys to mark the "Horseshoe Shoal" off Wicklow Head, December 1859.

In course of placing.

The Corporation recommend that the Tuns Bank buoys' entrance to Lough Foyle, in charge of the Londonderry Harbour Commissioners, should be taken under their jurisdiction, August 27, 1859. The Board of Trade refuse to sanction unless a charge be made on shipping for the maintenance of these buoys, November 8, 1859.

- XIX. The buoys were inspected in May and September 1857, and in May 1858, by the Committee of Inspection and Marine Inspector, and are constantly examined by Marine Inspector whenever he happens to be in the vicinity of any of them.
 XX. Vide returns as to beacons.
 XXI. The public are informed of any proposed or accidental change in the position of a buoy, or of a buoy being off its station, by advertisements in the principal English, Irish, and Scotch newspapers, particularly those connected with the shipping interests; also by printed "Notices to Mariners," which are sent by the Admiralty, Board of Trade, Trinity House, Commissioners of Northern Lights, and Collectors of Customs at the different ports in Ireland.

XXII. Yes, either by lightkeepers, or where no lighthouse is in the vicinity, by competent persons who undertake the service for a stipulated sum.
 XXIII. The Corporation are informed of any accident or change in the position of a buoy either by lightkeepers or persons appointed to watch the buoys; any person not in the service of the Corporation is rewarded for information of this sort. The Coast Guard also report any accidental changes in the position of a buoy.

- XXIV. *a, b, c, d, e.* None.
f. Captain Wilcox, R.N., states there is difficulty in distinguishing buoys in approaching Kingstown Harbour, February 10, 1858. Change of colour of St. Burford Bank buoy ordered March 1858. Admiralty informed accordingly.
g, h, i, j, k, l, m. None.

XXV. Yes; Herbert's and Stoney's, which have met the approval of this authority, they having been thoroughly tested by their officer and reported favourably upon.

XXVI. The buoys are immediately under the charge of their Marine Inspector, with general instructions to attend to their condition, and report immediately to the Board should any accident occur to them.

* This expenditure includes the sum of 85*l.* 12*s.* 8*d.* for spare buoy chains, none of which were used in 1858.

BEACONS.

- I. Port of Dublin Corporation, Ballast Office, Dublin.
 II. In book of charts and separate tabular statements herewith sent are described the number and positions, &c. of fixed beacons under the management of this authority. On the Admiralty charts sent with the General Lighthouse Return the positions of the beacons are marked.
 III. Responsible directly to the Board of Trade, whose sanction is requisite to the expenditure for maintaining beacons already established, or for placing new or additional beacons.
 V. See chart, drafts, and statement relative to buoys,

IX. In the book of charts referred to, and herewith sent, an engraved delineation of several of the beacons, and some additional drafts, have been prepared.

Beacons of masonry are the most durable, and are in so far preferable, but beacons of iron filled with masonry are in many situations considerably less costly, admitting of more rapid execution, and can with safety be sooner exposed to the action of the sea in storms.

X. With this is furnished, in a tabular form, a list of beacons under this authority with a statement under the following heads.—(See next page.)

IRELAND.
Circular V.
Question X.

Numbers, Names, and precise Situations of all Beacons maintained by the Port of Dublin Corporation at and off the Coast and several Ports of Ireland, with the Dates at which they were placed.

The Purpose for which each was erected.

No.	Name.	Precise Situation.	Latitude.		Longitude.	Dates at which they were placed.	Statement by Superintendent of Lighthouse.
			Lat.	Long.			
EAST COAST.							
1	Poolbeg	Dublin Bay, entrance of harbour on end of N.E. pier, covered at ¼ flood.	53 20 31	6 9 16	1848	1848	To mark northern side of channel, between the North Bull Sands, also to beacon outer end of Breakwater Pier.
1	Wicklow	Old lighthouse tower on Wicklow Head, south-west of lighthouses.	52 57 35	6 0 22	before 1810	1810	First built as a lighthouse tower, by the Revenue Board, erection of present lighthouse, the old tower, which, 141 ft high, formed a conspicuous mark by day, was left as a beacon.
1	Carrick Rock	Outside Greengore Point entrance to South Bay of Wexford.	52 14 13	6 18 33	—	—	Beacon to mark the Carrick Tidal Rock
1	Fundale Rock	East Coast of Co. Wexford, eastward of Carnore Point.	52 11 0	6 20 40	1846	1846	Beacon to mark the Fundale Tidal Rock, and assist in outer edge of shoal margin, extending from shore.
SOUTH COAST.							
1	Coningbeg Rock	South Coast of Co. Wexford, off South Saltee Island.	52 4 2	6 38 52	—	—	Damaged pillars of iron form a rough beacon on this rock, the bay, and to guide in the channel between Coningbeg Rocks.
5	Tramore Bay	Three towers on Great Newtown Head	—	—	—	—	The three towers on Great Newtown Head mark the point on west side of the bay, to distinguish that bay from entrance to Waterford Harbour.
1	Capel Island	Two towers on Brownstown Head	—	—	—	1821	The two towers on Brownstown Head mark the outer point of the eastern side of Tramore Bay.
1	Barrels	South of Youghal Harbour, west side of Entrance to Youghal Bay.	51 52 54	7 51 7	1848	1848	First intended for lighthouse tower, but not completed as a beacon tower to mark the approach from sea to Youghal Bay, and as a beacon on west side of the bay.
1	Horse Rock	In Courtmasherry Bay, Co. Cork	51 37 0	8 37 20	1848	1848	To mark tidal rock, and to guide to inner channel
1	Horse Rock	East of Barry Point in Courtmasherry Bay.	51 36 35	8 40 0	1853	1853	To beacon tidal rock, and to form a mark on rocky shoals of the bay, and to guide in the channel between Barry Point and the Horse Rock.
1	Wind Rock	In Clonakitty Bay, off Ringhead	51 35 38	8 51 15	—	—	Beacon to mark outer point of tidal rock, and to beacon entrance of Clonakitty Harbour.
3	Glandore Harbour	Co. Cork, in central channel of Harbour	51 33 12	9 6 40	—	—	To mark three tidal rocks, which bear north and south to each other, and guide through the harbour channel.
2	Baltimore	One in Baltimore Harbour, Co. Cork One on Beacon Point, east side of entrance to Baltimore Harbour.	—	—	—	—	Beacon marks tidal rock in the harbour
1	Bull Rock	Off Scull Point, west side of entrance to Scull Harbour, Co. Cork.	—	—	—	—	Beacon of masonry on east side of entrance marks the approach from seaward to Baltimore Harbour.
1	Dog's Rock	East end of Bear Island, west side of entrance channel.	51 38 30	2 46 15	1847	1847	To mark tidal reef off east end of Bear Island, to guide the approach from seaward, and in entering or leaving Bearhaven.
1	Cartown (Bearhaven)	On tidal rock, entrance to Castletown Harbour.	—	—	—	1847	To mark tidal rock, and to guide through entrance of Castletown.
1	Bearhaven (Western Entrance).	On Ardakians Point, western entrance to Bearhaven, Co. Cork.	—	—	—	1854	To mark western entrance channel of Bearhaven
WEST COAST.							
4	Valencia	Eastern entrance, one on tidal rock in channel, within entrance. Western entrance, three on tidal rocks in channel, near Portmagee.	51 53 45	10 19 17	1846	1846	Eastern Entrance.—One beacon to mark harbour tidal rock, and to guide in the main entrance channel. Western Entrance.—Three beacons to mark small tides in western entrance channel, and to guide through the entrance channel.
3	Castlemaine	Two beacon towers placed on Rossbeg Point.	—	—	—	—	To aid in navigating Castlemaine Bar Channel
1	Bowliec Rock	River Shannon, north side of channel, east of Farbeat Lighthouse.	52 30 30	9 19 13	1850	1850	To beacon tidal rock in River Shannon
1	Scarlet's Rocks	In River Shannon	52 14 25	8 45 33	—	—	To beacon the Scarlet's Tidal Rock in River Shannon westward of Cratloe.
1	Black Rock	In Galway Bay, between Carrigna Beacon and Margaretta Shoal.	53 14 15	9 6 20	1847	1847	To beacon tidal rock on north side of Galway Bay, and to guide between it and the St. Margaretta Rock, where there is a buoy when approaching seaward from Galway Harbour.
1	Carrigna Rocks	In Galway on north side	53 14 33	9 8 40	—	—	Beacon to mark tidal rock on the north side of Galway Harbour.
1	Canon (or Cannanagh Rock)	In centre of entrance to Cashla Bay	53 14 16	9 33 40	1845	1845	To mark tidal rock in centre of entrance channel of Cashla Bay, and guide towards inner anchorage.
1	Inishbinn	Two towers	—	—	—	—	Placed to lead into the small harbour
1	Carrigadillisk	In Clew Bay, outside Westport Bay	—	—	—	—	To mark this tidal rock, and to guide towards inner anchorage of Clew Bay.
1	Carrigamore (or Carrigacmore).	In Blacksod Bay, west side	—	—	—	—	To beacon tidal reef off west shore of Blacksod Bay, and to guide in passing in towards Ely Bay.
1	Sligo	Sligo Harbour, in channel near Oyster Island.	—	—	—	—	Tower to mark tidal rock in channel near Oyster Island, and for guidance in neighbouring channel.
3	Rutland Harbour	One on Nancy's Rock in Rutland Sound; three on tidal rocks in outer channel.	—	—	—	—	One pillar beacon on Nancy's (tidal) Rock in inner sound, the pillar beacons to mark tidal rocks in outer sound, and to guide through passages.
2	Gweedore Harbour	One on Beacon Rock, north side of entrance; one tidal rock, south side of entrance.	—	—	—	—	Two beacons to mark two of the tidal rocks in entrance from seaward to the small harbour and bay of Gweedore.
NORTH COAST.							
1	Bar Rock	County Donegal, Sheephaven	—	—	—	1857	Beacon to mark tidal rock in Sheephaven, and to guide through channel at bar.
1	Swilly Rocks	Lough Swilly, west side of entrance	55 15 10	7 35 25	1845	1845	Beacon to mark tidal rock off west shore of Lough Swilly, and within entrance of the Lough, and to serve for guidance on west side of entrance channel.
1	Brough Rock	Lough Foyle	—	—	—	—	Beacon to mark tidal rock in Lough Foyle on north side of the channel, and northward of the "Tuns" bank.
EAST COAST.							
1	Foreland	Off coast of County Down	—	—	—	—	Beacon to mark outer end of Foreland Point Reef on west side of Donaghadee Sound.
1	Sculmartin	Off coast of County Down	—	—	—	—	To beacon this half-tide rock, and to guide coasting vessels passing it, and the rocky shoals northward of it.
1	North Rock	North of South Rock Lighthouse	54 25 35	5 25 20	1856	1856	Beacon to mark this tidal rock, which is covered by a run of high water, and for guidance between north and south rocks.
1	Angus Rock	In centre of entrance to Strangford Lough	54 19 50	5 31 50	1851	1851	Tower to beacon Angus Rock, and to guide in navigation of the channel of entrance to Strangford Lough.
1	St. Patrick's Rocks	Entrance to Strangford Lough east of Killyard Point.	—	—	—	—	To beacon St. Patrick's Rocks, and to indicate approach to entrance channel of Strangford Lough.
1	Water Rock	Off Harbour of Killyough, County Down	54 14 20	5 30 30	—	—	Beacon to mark tidal rock outside of and in the approach from seaward to Killyough Harbour.
1	Cardee Rocks	Off Coast of County Dublin, northward of Balbrigan.	—	—	—	—	Beacon to mark tidal rock on north side of the approach from pillar to Killyough Harbour.
1	Taylor's Rock	Off north west side of Lambay Island	—	—	—	—	Beacon to mark tidal rock
1	Burton Rock	Off west side of Lambay Island	—	—	—	—	Beacon to mark tidal rock off west side of Lambay Island

The Means of Identification.	The Material used.	If Lighted by Night.	From what Fund maintained.	Cost of Maintenance in 1852 and 1853.		Names of Parties having Jurisdiction in the Locality.	Limits of Jurisdiction.	Authority under which they act.	Observations.
				1852.	1853.				
				£ s. d.	£ s. d.				
Beacon borne on four legs	Timber	-	-	102	1 10	Corporation for Preserving and Improving the Port of Dublin.	From Sutton N. land, S.	26 Geo. III. cap. 19. 32 Geo. III. cap. 33. 40 Geo. III. cap. 47. 17 & 18 Vict. c. 101.	
Octagonal tower of stone	Stone	-	-	-	-	Wexford Harbour Commissioners.	Wexford Harbour only.	6 & 7 Vict. "An Act for maintaining, improving and regulating the Harbour of Wexford, in the Co. of Wexford."	Beacons outside limits of Jurisdiction.
Pillar beacon with stays, having the letters "C.R." in open work.	Iron	-	-	-	-	Do.	Do.	-	-
Pillar beacon with stays	Iron	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	104	11 2	-	-	-	-
Two towers of masonry, with stone steps, and metal man on one of them.	Stone	-	-	-	-	-	-	-	-
Two towers of masonry, with stone steps.	Stone	-	-	-	-	-	-	-	-
Cular tower, with dome-shaped top (globe), with small stone ball over.	Stone	-	-	-	-	-	-	-	-
Pillar beacon, with stays, having a plate in form of a barrel, with the word "barrel" on it.	Iron	-	-	-	-	-	-	-	-
Cular tower, stands on off-shore rock	Stone	-	-	-	11 14 7	-	-	-	-
Pillar beacon	Iron	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	6	0 0	-	-	-	-
Pillar beacon	Iron	-	-	-	11 10 0	-	-	-	-
Table-form beacon	Stone	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	-	-	-	-	-	-
Pillar beacon, having a top plate with letters "D.R." in open work.	Iron	-	-	-	5 18 8	-	-	-	-
Pillar shaft without top	Iron	-	-	-	-	-	-	-	-
Cular tower, pierced with openings for doors and windows.	Stone	-	-	1794	6 11 1/2	-	-	-	-
Pillar, with stays and top beacon barred straps.	Iron	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	-	-	-	-	-	-
Two beacons of masonry	Stone	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	-	-	-	-	-	-
Cular tower of masonry	Stone	-	-	-	-	-	-	-	-
Iron or shaft of wrought iron, with a plate having letters "B. R." in open work.	Iron	-	-	-	11 7 0	Limerick Harbour Commissioners, Limerick Harbour Commissioners, Galway Harbour Commissioners.	Loophead North to Kerry Head S. Loophead N. to Kerry Head, S. Decks to Roadstead one mile.	-	Beyond limits.
Pillar without stays, and on top a ball open work.	Iron	-	-	-	6 0 0	Do.	Do.	-	Do.
Pillar with stays and top beacon in open work in form of half globe.	Iron	-	-	-	23 12 6	-	-	-	-
Cular towers	Stone	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	-	-	-	-	-	-
Pillar beacon	Iron	-	-	-	-	-	-	-	-
Sea tower with metal figure of man on top.	Stone and iron.	-	-	-	-	Commissioners for improving the town and harbour of Sligo.	Victoria Bridge, Sligo, to Wheaton Rock in Sligo Bay.	-	-
Key's Rock, iron shaft without top on top; Duck Sound, top beacon in form of cone partly sheeted; Maurice's Sound, pillar beacon with stays; Half Tide Rock, pillar beacon on stays, and at summit a beacon in form of triple cone.	Iron	-	-	28	14 6	-	-	-	-
Eight iron shafts	Iron	-	-	30	11 6	Lord George Hill	Not known	By purchase.	-
Circular beacon	Stone and iron casing.	-	-	-	-	A. J. R. Stewart, Esq., J.P.	Not known	By inheritance.	-
Pillar beacon, with top plates, having letters "S. R." in open work	Iron	-	-	1	6 0	Londonderry Harbour Commissioners.	Greencastle Fort, W., to Magilligan Tower, east.	17 & 18 Vict. cap. 107.	-
Pillar with stays and large cast iron plates on side extending from top to stay.	Iron	-	-	-	-	-	-	-	-
Pillar	Iron	-	-	-	1 11 11	-	-	-	-
Pillar, with stays and top plates having letters "S. R." in open work.	Stone and iron.	-	-	-	1 11 11	-	-	-	-
Beacon of masonry, cylindrical casing metal to level of cornice top of cone, of cone form, with globe on top.	Stone	-	-	1,390	14 11	Lord De Ros.	Audley's Point, bar end to Ballyharman, with all the waters of Lough Strangford.	Grant by Patent from Hen. VIII. to Earl of Kildare, confirmed by Charles II.	-
Stone tower, with open work top and iron.	Iron	-	-	-	2 14 4	-	-	-	-
Pillar with stays, top beacon of iron plates.	Iron	-	-	-	-	-	-	-	-
Shaft of iron with stays and ball at top	Iron	-	-	-	-	-	-	-	-
Pillar	Iron	-	-	-	4 0 0	-	-	-	-
Pillar	Iron	-	-	-	4 5 6	-	-	-	-
Top plates, with letters "B. R." in open work, horizontal plates attached to stays	Iron	-	-	-	4 5 6	-	-	-	-

IRELAND.
Circular V.

- XI. The use of iron in construction of fixed beacons is much more adopted than formerly, and admits of beacons being erected on smaller points of rock than formerly would have been practicable at any allowable cost.
- XII. See return as to buoys, *ante*.
- XIII. In the erection of a beacon, the form, &c. most suitable for the position is adopted.
- XIV. See return as to buoys, *ante*.
- XV. Beacons also are maintained from the Mercantile Marine Fund.
- XVI. None; there are not any tolls levied for beacons under this corporation.
- XIX. See return as to buoys, *ante*.
- XX. By committee of the Board, by the superintendent of lighthouses, and by foreman of repairs.
- XXIII. The lightkeeper of the nearest lighthouse station

is directed to make immediate report of accident to any beacon within his observation, or of which accident he may have been informed. The owners of attending boats to lighthouses are also to report accidents.

- XXV. Trial was made of an iron hollow pile put down by Dr. Potts' plan with intent to enlarge the structure if the trial proved successful. The trial was made by Messrs Fox and Henderson at their own risk; the sand was not penetrated to a sufficient depth, and the attempt was relinquished.

Trials have also been made of Mitchell's screw pile beacons. (*Note*.—When there are several screw piles well braced together, and secured below the limits of scour, they form a secure base, as at the Spit Bank and Dundalk pile lighthouses.)

CIRCULAR No. VI.

IRELAND.
Circular VI.

EVIDENCE OBTAINED THROUGH LLOYD'S AGENTS APPLICABLE TO COASTS UNDER THE SUPERINTENDENCE OF THE BALLAST BOARD.

58.

- I. John Walsh, agent for Lloyd's, Dublin.
- II. PORT OF DUBLIN.
- III. Corporation for preserving and improving the port of Dublin.
- IV. Yes, subject to the comments I make on subsequent queries.
- V. I believe the system of bnoys to be good. The beacon, however, at present on the end of Great North Wall is not sufficiently conspicuous to prevent accidents, which have occurred several times. A long piece of the wall at the outer end covers at half flood, and the channel between the extreme point and Poolbeg light being narrow requires a good, clear, and easily to be recognised beacon to point out the danger.
- VI. Personally I cannot, but a very experienced ship master well acquainted with the port suggests that a light should be placed on the east edge of Codling Bank, which extends much more to eastward than the Kish, as strangers coming up to Dublin at night or in thick weather with wind from west, coming outside the banks (as most strangers do) often get very far to leeward.
- VII. Oil.
- VIII. Not within my memory.
- IX. The sea buoys sometimes go adrift, but they are replaced the moment the weather permits.
- X. I cannot with the exception of those referred to in No. V, and the loss of the Victoria steam packet, which was lost under Bailey lighthouse in a snow storm, was attributed to the want of fog bell, which has since been remedied by the erection of one.
- XI. Half tide signal exhibited at the Poolbeg lighthouse.
- XII. Fog bells have been placed at the Bailey lighthouse and at the pier at Kingstown harbour, both absolutely necessary.
- XIII. They are painted black and red, the black being placed on one side of the channel, the red on the other; they are can shaped.
- XIV. I would not, excepting the introduction of "Stoney's" patent buoys where practicable.
- XV. No local dues are levied at this port in respect of buoys or beacons. The dues for lights are collected by the Collector of Customs for the Port of Dublin Corporation.
- XVI. I cannot specify any complaint, but in July, 1855, Mr. Bell, commanding one of the Chester and Holyhead steam boats, called my attention to the characters of the Kish, Bailey, and Poolbeg lights, the leading lights of the port, stating that the distinguishing features of each were not sufficiently marked to prevent mistakes in thick weather with an east or south-east gale, when the Kish light ship rode head to wind, and suggested certain alterations, which I, being then Receiver of Dues, brought to the notice of the Board of Trade, by whom the matter was referred to the Port of Dublin Corporation, and it was then decided that a revision of the lights on this part of the coast should take place when determining the character of Rock a Bill light, that revision has just taken place and been promulgated; the position of the lights on the Kish light ship has been altered, but I question much will the alteration meet the cases suggested by Mr. Bell.
- XVII. On the whole rather favourable.
- XVIII. There are no dues collected in respect of buoys or beacons. Those levied for lights are considered reasonable, but ship owners find it a hardship to have to pay lights when sailing out of the port in ballast, other than that supplied by the Corporation, which latter, from its character, is not suited, and frequently unsafe for vessels proceeding on a long voyage, or requiring to use ballast in a foreign port as damage for the return cargo.
- XIX. They are.
- XX. The general opinion is that the Irish lights are and have been well managed. I cannot speak so con-

fidently of buoys and beacons.—I would wish to state that in the above replies I confine myself strictly to the charges attaching to lights, buoys, and beacons, as there are charges levied as port charges in this port which I have always considered unjust and indefensible, and highly injurious to the trade and trading energy of the port.—12th January, 1860.

59.

- I. Wm. Nolan, merchant and shipowner, Wicklow.
- II. WICKLOW.
- III. The Ballast Board of Dublin, for the County Wicklow, Commissioners for the Harbour.
- IV. The coast is well buoyed and lighted, but I would suggest a buoy to be put on the Horse Shoe Bank.
- V. With the exception of the above, I do not consider any improvement could be suggested.
- VI. The south end of the Horse Shoe; the buoy to be red, to distinguish it from the Arklow Bank buoy; the reason for preferring the south end is, that it is further out, and the north end being close to Wicklow Head.
- VII. Oil in the Wicklow Head lighthouses, and gas in the harbour light.
- VIII. No instance of this has occurred; the lights are well attended to, and brilliant.
- IX. I am not aware of any of the buoys having been displaced.
- X. Many vessels have struck on the Horse Shoe.
- XI. Tide signals are not used, nor are they required.
- XII. The same observation applies to this question.
- XIII. No buoys used in the port of Wicklow.
- XIV. None.
- XV. Local dues are charged for mooring posts and quays, being corporate property.
- XVI. I do not know of any complaint.
- XVII. That they are quite sufficient, and carefully attended to.
- XVIII. All persons belonging to the town pay once a year; persons not belonging, pay for each voyage; the strangers object to any difference being made.
- XIX. They have been so applied, but are not adequate to the requirements of the port.
- XX. There is but one opinion on the subject, that they are well managed.

60.

- I. Dunn Newman and McDaniel, agents to Lloyd's.
- II. KINSALE.
- III. Under the control of the Ballast Board.
- IV. Sufficiently lighted, but require buoys on the Spit, Spur, and Wrinkle banks, also four warping buoys, two at each side of the new bridge now erecting over the Bandon River to enable vessels to warp through the portcullis.
- V. One buoy on Bullman Rock which is quite suitable.
- VI. The one recommended on the Spit is in the upper harbour, the other two are between the Old Fort and Money Point.
- VII. Oil.
- VIII. None to our knowledge.
- IX. Never heard of any.
- X. None to mention.
- XI. None used and none required.
- XII. Not used and not wanted.
- XIII. Bullinan's Rock buoy red, conical, and the only one.
- XIV. No.
- XV. Dues on the harbour light and paid to the Ballast Board.
- XVI. None to our knowledge.
- XVII. Lights sufficient but buoys wanted as before suggested.
- XVIII. Never heard any complaint.
- XIX. Yes.
- XX. No.

IRELAND.
Circular VI.

EVIDENCE OBTAINED THROUGH LLOYD'S AGENTS.

61.

- I. Robert Lander, of Kinsale, shipowner.
- II. KINSALE.
- III. Under the control of the Ballast Board.
- IV. Sufficiently lighted, but require buoys on the Spit, Spur, and Wrinkle banks, also four warping buoys, two at the side of the new bridge now erecting over the Bandon River to enable vessels to warp through the portcullis.
- V. One buoy on Bullman Rock which is quite suitable.
- VI. The one recommended on the Spit is in the upper harbour, the other two are between the Old Fort and Money Point.
- VII. Oil.
- VIII. None to my knowledge.
- IX. Never heard of any.
- X. None to mention.
- XI. None used and none required.
- XII. Not used and not wanted.
- XIII. Bullman's Rock buoy red, conical, and the only one.
- XIV. No.
- XV. Dues on the harbour light, and paid to the Ballast Board.
- XVI. None to my knowledge.
- XVII. Lights sufficient, but buoys wanted, as before suggested.
- XVIII. Never heard any complaint.
- XIX. Yes.
- XX. No.

62.

- I. Richard Huges, sub-agent Lloyd's, ship chandler, &c., Crookhaven.
- II. CROOKHAVEN.
- III. Trinity Board, Dublin, one light keeper on spot.
- IV. No.
- V. A light on Alderman Rocks, and buoy on Sunken rocks inside Small Rock, called the Black Horse.
- VI. On extreme outer or eastern point of Alderman rocks the present light being on the main land, and considerably to the westward of outer edges of Alderman, there being an opening in said main, it appears to vessels coming from westward, thereby endangering vessels who should run for said light, the rocks being low and not discernible from glares of light until too late for strangers to clear it—the present light could be dispensed with if placed on Alderman.
- VII. Oil.
- VIII. No complaints.
- IX. None displaced.
- X. Two vessels on shore on Alderman; one vessel on said rock from want of buoy.
- XI. Not used or required.
- XII. Required at lighthouses; none used at present.
- XIII. None.
- XIV. None.
- XV. Dues of light paid to Ballast Office and not collectors here. No dues on shipping whatever.
- XVI. Complaints to the Ballast Office, Dublin, respecting light on Alderman.
- XVII. Complaints by residents and ship masters of light being placed where it now is, and want of light on said Alderman Rocks.
- XVIII. Excessive.
- XIX. I believe so.
- XX. None.

63.

- I. J. H. Swanton, J.P., Lloyd's Agent, merchant, Skibbereen, Ireland.
- II. Port of SKIBBEREEN, and part of SOUTH-WEST COAST OF IRELAND.
- III. Trinity Board, Dublin.
- IV. No.
- V. To place a light on Galley Head, more necessary now, since the light on Cape Clear has been removed to the Fastnet Rock. 2. To repair the old tower on Horse Island, at the entrance of Castlehaven Harbour, and to keep it regularly whitewashed. 3. To place a buoy on Bulbig Reef, inside of Cape Clear. 4. To have a beacon placed to mark best passage through Gascanane Sound, between Cape Clear and Shirkin Island. 5. A buoy on west end of Tourane Rocks. 6. A buoy on the Amelia Rock. 7. A buoy on Moore's Rock in entrance to Roaring Water Bay.
- VI. On Galley Head a light, for the reason given in answer to No. V., and because of the Doolig Rocks (which are very dangerous) being near Galley Head.

I beg to call particular attention to the want of a buoy on the Bulbig Reef inside of Cape Clear, and that the passage through Gascanane Sound (east end of Cape Clear), should be marked by a beacon, i.e., the best passage pointed out by a beacon. Also a buoy should be placed on the west end of Tourane Rocks, between Horse Island and East Calf, in Long Island Bay. Also a buoy on the Amelia Rock, at the east entrance of Long Island Sound, near Castle Island. Also a buoy on Moore's Rock in entrance to Roaring Water Bay, between Carthy's and Horse islands; all the above rocks have at one time or other done injury to vessels.

- VII. Oil at Fastnet light.
- VIII. No complaints.
- IX. None.
- X. A vessel struck lately at night on the Doolig Rocks and had there been a light on Galley Head she would not have struck.
- XI. No, none required.
- XII. No.
- XIII. None.
- XIV. No.
- XV. No local dues.
- XVI. No complaints that I am aware of.
- XVII. See V and VI.
- XVIII. I cannot say.
- XIX. So far as I know they are.
- XX. No.

64.

- I. Henry Benner, Bridge Place, Tralee, general merchant, Lloyd's agent.
- II. TRALEE.
- III. The Dublin Ballast Board have charge of the lighthouse on Samphire Island. The Tralee Harbour Commission have charge of the buoys.
- IV. I consider that the light is not sufficiently well lighted; the buoys are sufficient.
- V. The light to seaward being red is not of sufficient magnitude to be seen at any distance.
- VI. I do not conceive that additional lights, &c., are required.
- VII. Oil.
- VIII. I have not heard of any of these having happened.
- IX. I have not heard, unless a very heavy storm may break one occasionally, which is immediately replaced. No accident has occurred in consequence.
- X. I know of none.
- XI. None are used, nor do I see any necessity for them.
- XII. None used or required.
- XIII. Black casks; all arranged on south margin of channel.
- XIV. No.
- XV. I am not aware of any local dues being levied in respect of either of these.
- XVI. Complaints have been frequently made of the insufficiency of the Samphire light by masters of vessels and steamers frequenting this port; reported, if I do not mistake, to the Dublin Ballast Board, without result.
- XVII. All complain of the light.
- XVIII. I have heard of no complaints.
- XIX. Nil.
- XX. Generally considered all well managed.

65.

- I. Robert McCarthy, Tralee, harbour master.
- II. TRALEE.
- III. Ballast Board, Dublin, management of the lighthouse; Harbour Commissioners, arrangement of the buoys.
- IV. I do not consider they are sufficiently lighted; I consider the buoys are sufficient.
- V. I consider the light is bad, and cannot be seen far at sea.
- VI. I do not consider any are necessary.
- VII. Oil.
- VIII. I am aware that the light, such as it is, has been carefully attended to and duly exhibited, and that no accident has occurred through neglect.
- IX. The buoys are regularly attended to, and no accident has occurred in consequence of them.
- X. I know of none.
- XI. There are no tide signals, nor do I think any are required.
- XII. Same answer as No. XI.
- XIII. Painted black, cask shape; laid down on the south side of the channel.

EVIDENCE OBTAINED THROUGH LLOYD'S AGENTS.

- XIV. I would not recommend any change.
 XV. I know of no dues levied as a local charge, either for lights or buoys.
 XVI. Several masters of sailing and steam vessels have complained of the obscurity of the Saphire light, which was, I believe, reported to the Ballast Board without success.
 XVII. The general feeling is that the light is bad and requires to be improved.
 XVIII. I heard no one complain at any time.
 XIX. They are.
 XX. I believe the general opinion to be that they are all well managed.

66.

- I. William Blair, Kilrush, merchant.
 II. River SHANNON, near KILRUSH.
 III. None.
 IV. No.
 V. Buoys required about Deal, and a light on Scatting Island.
 VI. Light on end of quay for safety of vessels and steamers arriving at night.
 VII. Nil.
 IX. The buoys that were put on Deal are all gone.
 X. None to my knowledge.
 XI. None used.
 XIII. None.
 XVII. Is in favour of a light on Scatting, and another on end of quay.
 XVIII. None.

67.

- I. John Fitzgerald Studdart, Rear-Admiral, Port Clane, Pella, Kilrush.
 I. The River SHANNON, principally KILRUSH.
 III. Know of none.
 IV. Not sufficiently.
 V. The north entrance or channel into Kilrush Harbour requires a light of some sort. Both it and the eastern entrance require buoys to indicate the commencement of shoals, but especially on the Half Rock which fouls both anchorage and channel.
 VI. In addition to No. V question buoys are required on the shoaling south of Hogg Island, and on sunken rocks in the vicinity of Scatting Roads.
 IX. Buoys were formerly judiciously placed along the east end of Beal Bar, a most dangerous shoal, but at the same time the great protection, as a break-water, to the River Shannon. They have been long since either removed or destroyed. They should be replaced, and directions issued by the Admiralty to the revenue cutter stationed in the river to see to their protection.
 XI. Tide signals, and a small light at the head of the pier at Kilrush would be attended with benefit, one to indicate the height of the water, the other to guide in.

68.

- I. Wm. Keown, merchant, Burton Port, Ardra.
 II. RUTLAND HARBOUR, BURTON PORT, ARRANMORE, and BOYLAGH BAY, NORTH-WEST OF IRELAND.
 III. Trinity Board, Dublin.
 IV. No.
 VI. The light should be placed in the same position as the old one on the island of Arranmore, only a little more elevated, so that it might be better seen. A buoy is much required on the Blind Rock at the south-west of Rutland Harbour; the beacons are all right.
 VIII. The light on Arranmore has been extinguished for the last 18 years, during which time there have been a number of wrecks on the island and in Boylagh Bay, the greater number of which has been attributed to a want of a light. In 1856, the ship "Marchioness of Clydesdale," 1857, the ship "City of Worcester," total.
 XI. Not required.
 XII. Not required.
 XIII. Beacons round, red and black.
 XIV. No.
 XV. None.
 XVI. The attention of the Board has been called to the want of a light, as I understand they have determined to relight it as soon as possible.

- XVII. The mariners frequenting his place and coasting are all most anxious to have the light—also all the shipowners on the north-west coast.

69.

- I. Samuel Casidy, agent for Lloyd's, Killybegs.
 II. KILLYBEGS.
 III. Captain Roberts, R.N., Ballast Board, Dublin.
 IV. I consider that the harbour of Killybegs is sufficiently lighted, buoyed, and beaconed, but the small adjacent harbour of Bluckless to the south-east and the bay of Fintras to the north-west is not.
 V. I do not think any change is necessary, in either the position, or otherwise, of the present lights and buoys.
 VI. I would recommend a buoy or beacon on the Black Rock in the bay of Fintras, as this rock is quite covered at high water, and lies directly in the way of vessels working up to the harbours of Killybegs and Bluckless, and also two or three perches or beacons are very much required, indeed on some half tide rocks in the harbour of Bluckless. The trade of this small port (Bluckless) in the last ten years rapidly increasing, particularly in bread stuffs.
 VII. Oil is the material in use in the harbour lights on Killybegs and the adjacent lights of St. John's Point and Rathlin O'Birn Island.
 IX. The buoy on the shoals off St. John's Point, called Bullock More was displaced about 12 months ago, but has since been replaced, and no accident occurred.
 X. Vessels have perpetually touched and strained on the half rocks in Bluckless Harbour, called the Buck Rock and the Flat Rock, from want of beacons or perches thereon.
 XI. Not at all required.
 XII. Not required.
 XIII. There are in the harbour of Killybegs three buoys, coloured red, white, and black respectively, of a conical form, placed on a sand bank, one at each end, and one in the centre.
 XIV. No changes requisite.
 XV. No local dues, with the exception of the usual light dues, which are collected by the chief boatman of Coast Guard, and paid by him to the Collector of Customs, Sligo.
 XVI. None to my knowledge.
 XVII. Very good, indeed, as far as the harbour of Killybegs is concerned; but I have very often heard wishes expressed that the beacons in the harbour of Bluckless and the bay of Fintras were placed as I have suggested.
 XX. I am not aware of any complaints as to the management of the present lights.

70.

- I. George McGowan, Rathmullen, Co. Donegal, sub-agent for Lloyd's.
 II. LOUGHSWILLY.
 III. Ballast Board, Dublin.
 IV. Not sufficiently buoyed; well lighted.
 V. Three buoys required; two on west shore, viz., Macamus Point, Kinnigar Ridge; one on east side Carrigullan Rock, which have, I believe, been recommended by Capt. Bedford, R.N., lately surveying here.
 VI. Three buoys, viz., Macamus Point, Kinnigar Ridge, and Carrigullan Rock.
 VII. Faint light; oil.
 VIII. No.
 IX. Linsport buoy broke adrift, but was replaced immediately; one always kept in readiness; no accident occurred.
 X. None.
 XI. None wanted.
 XII. None required.
 XIII. One black buoy at Linsport; iron perch on Swilly Rock.
 XIV. None.
 XV. Not sure of the sums; received by the chief boatmen of Coastguard at Ramelton.
 XVI. None.
 XVII. Good, with exception of the buoys named being required.
 XVIII. No complaints.
 XIX. I believe they are.
 XX. Not aware of any.

EVIDENCE OBTAINED THROUGH LLOYD'S AGENTS.

IRELAND.
Circular VI.

71.

- I. Alexander M'Crea, Maddison, Doe Castle, Creeslonga, Strabane, Ireland, gentleman, agent for Lloyd's for the Association of Underwriters, Glasgow, and Liverpool.
- II. DUNFANAGHY.
- IV. I do.
- VII. There is no harbour light, nor is there one required; it is a bar harbour, and no lights or buoys would make it accessible by night.
- XI. Not required.
- XII. Not required.
- XIV. I think the buoys are sufficiently well adapted to the navigation, inclined buoys are of very little use as the channel is always changing.
- XV. None.
- XVII. I have never heard of an opinion expressed; very few vessels enter this harbour, and those only of the very smallest class.

72.

- I. Daniel Fall, shipbroker, sub-agent for Lloyd's, Portrush.
- II. PORTRUSH.
- III. No lights, buoys, or beacons.
- IV. No.
- V. None to be improved.
- VI. Lighthouse on Skerries; beacon on Stirk's Rock. Two mooring buoys in Skerries Roads wanted, and would be of use.
- VII. Very faint oil lamps used on pier heads, sometimes to assist steamers in only.
- VIII. Never exhibited, except on nights when steamers are expected, and of very little use. The steamboat companies have themselves provided a grate, which in very dark weather have lighted at their own expense, and placed on north pier head.
- IX. None.
- X. Cannot distinctly state that any accident could be attributed to any of the above wants, though wrecks have often taken place on Skerries.

- XI. Not required.
- XII. Not used, and do not think required, as fogs are not prevalent.
- XIII. None.
- XIV. None.
- XV. None.
- XVI. Not aware of any.
- XVII. Have heard master mariners express an opinion about necessity of light on Skerries.
- XVIII. No local dues.
- XIX. No local dues.
- XX. Nil.

73.

- I. Rob. Gage, jun., Rathlin Island, Ballycastle, Ireland.
- II. RATHLIN ISLAND.
- III. The Ballast Office Commissioners. Dublin
- IV. Yes.
- V. I can suggest no improvement.
- VI. I don't recommend any additional lights or buoys.
- VII. I am told rape oil is used in the lighthouse on this island.
- VIII. I believe the light has constantly been exhibited since it was first lighted.
- IX. There are no buoys at or near this island.
- X. I cannot mention any accident; I consider the place sufficiently well lighted.
- XI. There are no tide signals used, and I do not consider that any are wanted.
- XII. None are used and none are required.
- XIII. There are none.
- XV. No dues of any kind as mentioned are levied.
- XVI. I know of no complaints since the light on this island was exhibited.
- XVII. I have heard masters of passing steamers say, the light here was quite sufficient.
- XVIII. No local dues in respect of lights, buoys, or beacons are collected here.
- XIX. None are collected here.
- XX. I am not aware of any opinion on the subject.

LIST OF AUTHORITIES

HAVING CHARGE OF

LIGHTS, BUOYS, AND BEACONS,

IN THE UNITED KINGDOM.

(SO FAR AS THE COMMISSIONERS WERE ABLE TO ASCERTAIN) TO WHOM FORMS WERE
SENT TO BE FILLED UP.

NOTE.—Those marked * have not furnished Returns, thus—

Hayle.*

The Headings of the columns show the Circular and the particular question under which the information is given, thus, the heading—

Character.
Circular III. 21.

shows that throughout the returns the character of the illuminating apparatus of every lighthouse named, will be found under question No. 21 in the replies to the Special Lighthouse Returns, Circular No. III.

o means none. * means no information given.

At the end of the Local Returns at page 424 a further list is given of those Local Authorities which were not mentioned in the lists first obtained by the Commissioners, but whose names appear in this Appendix, or in former Parliamentary Returns, or whose lights have been seen by the Commissioners, or whose lights appear in the Map published by the Board of Trade, or are mentioned in the Admiralty Lists, or elsewhere, but are not included in this List, or in the Returns rendered by Local Authorities.

So far as can be ascertained from all these sources of information, there are in the United Kingdom 171 Authorities acting separately in the management of Lights, Buoys, or Beacons, not including the three General Authorities.

LIST OF AUTHORITIES HAVING CHARGE OF LIGHTS, BUOYS, AND BEACONS IN THE UNITED KINGDOM.

Name and Designation of Authority.	Source of Income. Cir. III. 42 Cir. V. 14-15.	Total Income and Expenditure in 1888.		Keeper's Salary, Highest. Cir. III. 35.	Cir. II. 2. Number of		Cir. III. 21. Character		Number of Buoys in Position. Cir. V. 5e.	System. Cir. V. 12-15.	Number of Deacons. Cir. V. 10.	Tide Signals. Cir. III. 55. Cir. VI. 11.	Cir. VI. 17-18. Lord's Evidence, General Opinion.		
		Income.	Expenditure.		Shore Lights.	Floating Lights.	D.	C.					As to Efficiency of Lights, Buoys and Beacons.	As to Due in respect thereof.	
3. GENERAL AUTHORITIES.															
1. Trinity House, England.	Dues.	257,210l.	172,285l.	75l.	82	33	30	52	364	New, red or black, star-board; chequered, port.	67	None used at large lights.	Unsatisfactory as respects local wants.		
2. Commissioners of Northern Light Houses, Scotland.	Ditto	26,390l.	59,746l.	60l.	46	0	32	14	92	Port black, star-board red, going in.	33	ditto	Unsatisfactory as regards islands and local wants.		
3. Ballast Board, Ireland.	Ditto	15,710l.	46,858l.	64l. 12s. 4d.	69	4	18	51	53	Port, red; star-board, black.	35	ditto	Unsatisfactory as respects local wants.		
Total under General Authorities	-	-	-	-	197	37	0	117	501	-	153	ditto			
LOCAL AUTHORITIES. (Alphabetically arranged.)															
ENGLAND.															
1. Aberdeevy	Tonnage dues.	*	*	*	*	*	*	*	1	At entrance black buoy, red inside.	0	0	Unsatisfactory.	0	
2. Aberrystwith	*	*	*	*	1	*	*	*	*		*	*	*	*	
3. Admiralty	-	-	-	-	-	-	-	-	-	Various					
Brehaven, Bantry Bay.	*	*	*	*	1	*	*	*	5	Red, white, and black, white to be kept on north.	2	0	Unsatisfactory.	0	
Deptford	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Deronport, Sea Plymouth.	Ditto	0	0	0	2	*	Gas lamps.	0	6	0	1	0	0	0	
Pennuroac	Ditto	0	0	0	0	0	0	0	0	0	0	0	0	0	
Plymouth	Parliament.	0	0	0	0	0	0	0	17	Entering red star-board, white chequered port.	0	*	0	0	
Portpatrick	Ditto	0	65l. 1 s.	57l. 10s.	1	0	D	0	3	0	1	0	0	0	
Portsmouth	Ditto	0	0	10l.	1	0	D	0	22	0	3	0	0	0	
Sheerness	Ditto	0	0	0	1	0	0	0	2	0	0	0	Satisfactory	Satisfactory	
Woolwich	Ditto	0	0	0	0	0	0	0	0	0	0	0	*	*	
4. Aldbro	*	*	*	*	*	*	*	*	1	0	*	0	Satisfactory	Satisfactory	
5. Alderney	*	*	*	*	*	*	Gas.	*	*	*	*	*	Unsatisfactory	C	
6. Amble Workworth, Harbour Commissioners.	0	0	0	0	0	0	0	0	0	0	0	0	Gas at pier head, when harbour can be entered.	Satisfactory	Satisfactory
7. Barmouth	0	*	*	0	0	0	0	0	2	0	0	0	0	0	
8. Barrow, Harbour Commissioners.	Harbour dues.	*	*	0	0	0	0	0	19	Entering red, right; black, left.	0	0	0	0	
9. Beaumaris, Town Council.	Ditto	*	*	*	0	0	0	0	13	Entering black, lar-board; red, star-board.	1	*	Satisfactory	Satisfactory	
10. Berwick, Harbour Commissioners.	Ditto	*	96l. 8s. 6d.	62l.	1	0	D	0	0	0	0	0	At night, red light, when not less than 10 feet on bar.	0	0
11. Blakeney, Harbour Commissioners.	Ditto	88l. 4s. 0d.	50l. 6s. 4d.	0	0	0	0	0	13	Black star-board; white lar-board.	Vary from 60 to 80.	*	0	0	
12. Blyth, Harbour and Dock Company.	Harbour and dock dues.	*	*	*	2	0	0	C2	0	0	2	0	Flag by day, red light at night; for nine feet water in channel.	Unsatisfactory.	Satisfactory
13. Boston, Mayor, Aldermen, and Burgesses.	Pilotage dues.	*	*	Seven pilots at 2l. each, 49l.	*	*	Dip candles and oil.	*	50	Entering black star-board, red lar-board.	2	0	Very satisfactory.	Very satisfactory.	
14. Bridgwater, Town Council.	Harbour dues.	*	*	*	*	*	*	*	0	White, black, and chequered. Arrangement not given.	*	0	Unsatisfactory.	Satisfactory	
15. Bridport, Harbour Commissioners.	0	0	0	0	*	*	Tallow candles.	0	0	0	0	0	0	0	
16. Brixham, Commissioners for Improving Harbour and Market of.	General Harbour funds.	*	*	*	0	0	0	0	2	0	0	0	0	0	

LIST OF AUTHORITIES HAVING CHARGE OF LIGHTS, BUOYS, AND BEACONS IN THE UNITED KINGDOM.—continued.

Name and Designation of Authority.	Source of Income.	Total Income and Expenditure in £500.		Keeper's Salary, Highest.	Cir. II. 2. Number of		Cir. III. 21. Character		Number of Buoys in Position.	System.	Number of Beacons.	Tide Signals.	Cir. VI. 17-18. Lloyd's Evidence, General Opinion:			
		Cir. III. 42 Cir. V. 14-15.	Cir. III. 15. Cir. III. 43-44. Cir. V. 16.		Cir. III. 33.	Shore Light.	Floating Lights.	D.					C.	Cir. III. 55.	As to Efficiency of Lights, Buoys and Beacons.	As to Dues in respect thereof.
1 <i>Aarmarthen</i> -	Trinity House.	*	*	*	2	0	Oil.	*		Black and 4-channel chequered.	*	*	Not satisfactory.	Satisfactory		
2 <i>Aarnroon</i> -	Harbour Trust Fund.	0	80l. 4s. 7d.	Four at 11l. 4d.	1	0	0	C	14	Entering black post, red star-board, &c. &c.	1	0	Satisfactory	Ditto		
3 <i>Cardiff, Corporation</i>	Corporation	*	*	0	1	*	0	0	3	0	0	0	Ditto	Ditto		
4 <i>Cardiff, Trustees, agents of Bute</i>	Owners of Bute Docks.	*	*	*	*	*	0	0	*	0	0	0	Ditto	Ditto		
5 <i>Cardiff, The Dock & Railway Co.</i>	Harbour dues.	339l.	78s.	Four at 50l. 10s.	4	1	0	C	14	Red, star-board, black port.	2	*	Unsatisfactory.	Unsatisfactory.		
6 <i>Chestermouth, G. G. & Co. Ltd.</i>	Tonnage dues.	*	*	*	*	*	*	*	*	*	*	*	*	*		
7 <i>Cardiff, Harbour Commissioners</i>	Harbour dues.	477l. 2s.	334l. 13s. 5d.	Three at 64l. 12s.; one at 46l. 16s.	1	0	0	D	0	11	Red, star-board, black port.	1	Round ball by day and green light by night; denotes 8 feet, water, or harbour.	0	0	
8 <i>Cardiff, Harbour Commissioners</i>	Ditto	*	*	*	1	0	Gas and oil.	*	*	*	*	Red flag and ball, entered to show difference in depth of water; lights at night.	Satisfactory	Satisfactory		
9 <i>Cardiff, Harbour Commissioners</i>	Navigation Commissioners.	*	*	0	0	0	0	0	2	0	20	0	0	0		
10 <i>Cardiff, Harbour Commissioners</i>	*	*	*	*	2	*	Gas and parabolic reflector.		8	0	3	Ball by day and light at night at half tide.	0	0		
11 <i>Cardiff, Harbour Commissioners</i>	Harbour dues.	*	*	*	0	0	0	0	0	0	0	0	Unsatisfactory.	Unsatisfactory.		
12 <i>Cardiff, Harbour Commissioners</i>	Ditto	*	*	50l.	1	0	Gas.		2	0	14	0	Ditto	Satisfactory		
13 <i>Cardiff, Harbour Commissioners</i>	Ditto	*	162l.	Two at 61l. house, &c.	1	0	Cata-dioptric.	*		Entering, black star-board, white port.	1	Red light by night, and red ball by day, from half-rod to land-side.	*	*		
14 <i>Cardiff, Harbour Commissioners</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
15 <i>Cardiff, Harbour Commissioners</i>	Oil buoyage dues.	*	*	*	5	2	0	C	30	Entering, black star-board, red and white port.	4	0	Satisfactory	Satisfactory		
16 <i>Cardiff, Harbour Commissioners</i>	Conservators of river.	0	*	0	0	0	0	0	*	*	*	0	0	0		
17 <i>Cardiff, Harbour Commissioners</i>	Harbour dues.	*	*	*	6	0	0	0	0	0	5	0	0	0		
18 <i>Cardiff, Harbour Commissioners and Trustees</i>	Ditto	*	4,12l. 7s. 2d.	50l. 3s. 5d.; house, &c.	2	0	0	C	5	Deepest water on south of buoys.	1	Red light, half-rod to land-side at night.	0	0		
19 <i>Cardiff, Harbour Commissioners</i>	*	*	*	*	*	*	*	*	*	*	*	*	*	*		
20 <i>Cardiff, Harbour Commissioners</i>	General fund.	*	*	*	1	0	Gas & double parabolic reflector.		0	0	0	Balls on flag-staff by day, and lantern by night.	Unsatisfactory.	0		
21 <i>Cardiff, Harbour Commissioners</i>	Harbour, &c. dues.	£ 2 s. d. 19,419 11 6	6,301l. 13s. 9d.	00l.	7	3	0	C	68	By colour, (orn, sound bell, letters and perch and ball.	2	Ball by day when 11 feet of water; by night a fixed light for same.	0	0		
22 <i>Cardiff, Harbour Commissioners</i>	Eastern Counties Railway Company.	0	*	*	0	*	Gas and oil lamps at pier.		0	0	0	0	0	0		
23 <i>Cardiff, Harbour Commissioners</i>	Corporation fund.	0	55l.	*	0	0	Gas lamps at pier.		0	0	0	0	0	0		
24 <i>Cardiff, Harbour Commissioners</i>	Tonnage dues, provided by Corporation.	*	333l. 14s. 5d.	*	*	*	*	*	*	Entering, white buoy on star-board, black on port.	*	*	0	0		
25 <i>Cardiff, Harbour Commissioners</i>	Corporation.	20l.	11.	0	0	0	0	0	0	0	9	0	0	0		
26 <i>Cardiff, Harbour Commissioners</i>	Harbour fund.	0	240l.	12l.	7	0	0	C	2	0	2	0	Satisfactory	Satisfactory		

LIST OF AUTHORITIES HAVING CHARGE OF LIGHTS, BUOYS, AND BEACONS IN THE UNITED KINGDOM—continued.

Name and Designation of Authority.	Source of Income. Cir. III. 42. Cir. IV. 14-15.	Total Income and Expenditure in 1888.		Keeper's Salary, Highest.	Cir. II. 2. Number of		Cir. III. 21. Character		Number of Buoy's in Position. Cir. V. 3e.	System. Cir. V. 12-13.	Number of Beacons. Cir. V. 10.	Tide Signals. Cir. III. 55. Cir. VI. 11.	Cir. VI. 17-18. Lloyd's Evidence. General Opinion:		
		Income.	Expenditure.		Cir. III. 33.	Shore Lights.	Floating Lights.	D.					C.	As to efficiency of Lights, Buoys and Beacons.	As to Duos in respect thereof.
45. Margport, Harbour Trustees.	Harbour and dock dues.	*	*	*	1	0	Tidal light, catadioptric.		0	0	0	Red ball in day and light at night when 2 feet water.	0	0	
46. Neath, near Swansea	-	*	*	*	*	*	*	*	10	0	0	*	Not quite Satisfactory.	*	
47. Newbiggin by the Sea.	Trinity House.	*	*	0	0	0	0	0	0	0	0	0	*	*	
48. Newcastle-on-Tyne Trinity House.	Newcastle Light Fund.	2,168l.	1,916l.	240l.	1	0	A single-silvered parabolic reflector.		17	*	10	Blue flag at 1st quarter flood until 1st quarter ebb.	Not quite satisfactory.	*	
49. Newhaven	Harbour Dues.	*	*	*	2	0	*	*	1	0	0	Coloured light, flag, and balls.	*	0	
50. Newport, Isle of Wight.	Corporation.	*	*	0	0	0	0	0	2	Bad	0	0	0	0	
51. Padstow, Harbour Association.	Trinity House.	*	*	0	0	0	0	0	0	0	0	0	0	0	
52. Pezance	Ditto	*	*	0	0	0	Light at pier.		5	Colour and form.	4	Black Ball by day and red light by night when 15 feet water.	Un-satisfactory.	0	
53. Poole, Town Council	Harbour Fund.	*	205l.	50l.	5	0	Oil lamp and silvered reflectors.		22	Red, black, chequered, green.	5	0	General satisfaction	General satisfaction	
54. Portleaw, Glamorgan Harbour Commissioners.	Llyn's Valley Railway Company.	*	*	0	0	0	0	0	0	0	0	0	Un-satisfactory.	Un-satisfactory.	
55. Portreath	-	*	*	*	*	*	*	*	0	0	0	*	0	0	
56. Pwllheli, Corporation.	*	*	*	*	*	*	*	*	0	0	0	*	0	0	
57. Ramsgate Trustees of Royal Harbour	Harbour Dues.	*	*	Two keepers salary and allowances together about 108l.		1	0	D	0	0	0	A red ball for 10 feet water. Red light at night 10 feet. Green light below 10 feet.	0	0	
58. Ribble, Navigation Company.	Tonnage of vessels.	*	163. 10s. 4d.	75l. the Boatswain's assistant.	2	0	D	0	17	*	7	0	Not satisfactory.	Satisfactory	
59. Rochester	-	*	*	*	*	*	*	*	*	*	*	*	0	0	
60. Rye, Harbour Commissioners.	Harbour dues.	*	*	45l. 10s.	2	0	Copper silvered reflector.		4	*	2	Two white lights when water has risen to 10 feet. Put out when fallen below 10 feet.	Satisfactory	Ditto	
61. Saltash	Port dues.	*	*	*	2	0	Gas and oil.		*	By colour and name.	*	*	Generally satisfactory.	Not altogether satisfactory	
62. Sandwich	*	*	*	*	*	*	*	*	*	*	*	*	0	0	
63. Saundersfoot	Harbour dues.	*	*	*	*	*	Candles.		*	*	*	A ball by day and light by night for 5 feet water at pier.	Not quite satisfactory	Satisfactory	
64. Scarborough	Ditto	*	*	*	*	*	Gas.		*	*	*	A ball by day and light by night.	Ditto	0	
65. Seaham Harbour, Marchioness of Londonderry.	*	*	*	*	*	*	Catadioptric.		*	*	*	*	0	0	
66. Shoreham, Harbour Commissioners.	Harbour dues.	*	*	42l. 16s.	*	*	High light. D.	Low light. Arc and parabolic reflector.	*	*	*	At slack-water tide light made red; by day flag and balls.	0	0	
67. Southampton	General Fund of Commissioners.	*	168l. 6s. 10d. (B and B.)	*	*	*	Gas.		16	Black west, red east, and name.	5	*	Satisfactory	Un-satisfactory.	
68. Southwold, Suffolk Corporation.	Harbour dues.	*	*	0	6	*	Gas lamps.		3	0	2	*	0	Satisfactory	
69. Spaulding, under-Boston.	*	*	*	*	*	*	*	*	*	*	*	*	0	C	
70. St. Ives	Ballast fund.	*	*	5l.	*	*	Gas reflectors		*	Black knobs	*	Harbour light when vessels can come to pier.	Satisfactory	*	
71. Stockton-on-Tees	Tonnage Dues.	*	735l. 15s. 6d.	75l.	4	1	D.	C.	*	*	*	*	0	0	

LIST OF AUTHORITIES HAVING CHARGE OF LIGHTS, BUOYS, AND BEACONS IN THE UNITED KINGDOM—continued.

Name and Designation of Authority.	Source of Income.	Total Income and Expenditure in 1888.		Keeper's Salary, Highest.	Cir. II. 2. Number of		Cir. III. 21. Character		Number of Buoys in Position.	System.	Number of Beacons.	Tide Signals.	Cir. VI. 17-18. Lloyd's Evidence. General Opinion						
		Cir. III. 42. Cir. V. 14-15. 2	Cir. III. 15. Cir. III. 43-44. Cir. V. 16		Cir. III. 35.	Shore Lights.	Floating Lights.	D.					C.	Cir. V. 56.	Cir. V. 12-13.	Cir. V. 10.	Cir. III. 35. Cir. VI. 11.	At to Efficiency of Lights, Buoys and Beacons.	As to Dues in respect thereof.
Underland, Commissioners of River	Harbour dues.	*	2887. 18s.	70l.	2	0	Catadioptric		5	0	2	Self reflecting apparatus.	Satisfactory	Unsatisfactory.					
Abbot Port	Ditto.	*	*	*	0	0	0	0	8	Entering, black, star-board; red, port.	1	0	Ditto	*					
Alcington, Devon	Tonnage dues.	*	*	*	1	0	Gas with reflectors.		*	*	*	*	Unsatisfactory.	*					
Alcington*, Breckshire	*	*	*	*	*	*	*	*	*	*	*	*	0	0					
Alverstone	Tonnage dues.	267. 16s. 11d.	80l.	*	1	0	*	*	12	*	16	Flag and lamp.	0	0					
Alwells, Norfolk	Harbour fund.	*	*	0	0	0	0	0	3	Fairway or sea buoy on the bar, red; west side, black; east side, white.	*	*	Unsatisfactory.	Satisfactory					
Alymouth	General fund of Corporation.	*	*	*	1	0	Gas.		*	Black, and placed where wanted.	*	*	Ditto	*					
Alymouth	*	*	*	*	2	*	Gas and oil.		*	*	*	*	A red flag by day and two lights at night, when 8 feet water at bar. Red flag, halfmast, 10 feet. Red flag, halfmast, ball under, 10 feet. Red flag, halfmast, ball over, 12 feet. Red flag, masthead, exceeding 12 feet.	Satisfactory	Satisfactory				
Alymouth	Tonnage dues.	*	*	*	2	*	On burner and reflector.		*	Red on north, black on south.	*	*	Satisfactory	Generally satisfactory.					
Alymouth, South of Bay	Harbour fund.	30l. averaged	18l. averaged	3l. 3s. and house and coals.	1	0	Gas and silvered reflectors.		2	*	*	0	Ditto	Satisfactory					
Alymouth, Sir B. P., & Alwells	Harbour dues.	2,684l.	380l.	0	0	0	0	0	*	Black, E. Red, W. To guide into harbour.	34	*	0	0					
Alymouth, Harb. Trustees.	*	*	*	*	2	*	Gas lights put out when not sufficient harbour water.		*	*	*	*	Lighted while there is 8 feet of water in harbour.	0	0				
OTLAND.																			
Alymouth, the Harb. Commissioners.	*	*	*	*	2	*	Red light when harbour can be entered; green dangerous.		*	*	*	*	0	0					
Alymouth, the Earl of Eglinton and Town.	Harbour revenue.	*	*	50l. 8s.	1	0	Stevenson's heliometal apparatus reflecting and retracting. Gas argand.		4	*	2	0	0	0					
Alymouth, the Harbour Trustees.	Ditto	*	*	20l.	3	*	D	0	2	0	1	Flag hoisted when 8 feet of water at bar; half tide light for same at night.	Satisfactory	Satisfactory					
Alymouth	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Alymouth Green, Gateshead, Jas. MacAdam, & Co.	Tonnage dues.	*	*	0	0	0	*	0	0	0	0	0	0	0					
Alymouth, the Harbour Trustees.	*	*	*	0	0	0	Seven gas lamps		2	*	0	0	0	0					
Alymouth	*	*	*	30l.	1	*	Gas.		0	0	1	0	0	0					
Alymouth, the Harbour Trustees.	Tonnage dues.	24l. 6s.	24l. 2s.	*	1	*	Gas, C		*	*	1	0	0	0					
Alymouth Canal Commissioners.	Tonnage dues.	*	*	*	*	*	*	*	*	*	*	*	Satisfactory	Satisfactory					
Alymouth Navigation Trustees.	Harbour and river dues.	*	24l. 3s. 11d.	Fire keepers amounting to about 150l. One at 75l. One at 35l.	7	*	D	C2	*	Buoys on shoal water.	*	0	Ditto	Ditto					
Alymouth, the Harbour Trustees.	Lighthouse trust.	5,835l.	2,631l.	0	3	0	0	C	24	Red, star-board; black, port.	*	0	0	0					
Alymouth, the Commissioners of Tonnage, the Trinity Harb., Dundee.	With navigation. General fund.	1,452l. 19s. 9d.	1,791l. 10s.	60l.	5	0	0	0	13	Colour.	*	0	Satisfactory	0					
Alymouth, the Harbour Commissioners.	Harbour dues.	*	*	*	1	*	Oil lamp		0	0	*	Flag by day and light by night when vessel can enter harbour.	Perfectly satisfactory	0					
Alymouth, H. A. I. M., Esq., of	0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Alymouth, the Harbour Trustees.	Harbour funds.	*	*	*	0	0	0	0	2	*	2	*	0	0					
Alymouth, the Harbour Commissioners.	General fund.	*	*	*	2	0	Argand		0	0	0	0	0	0					

LIST OF AUTHORITIES HAVING CHARGE OF LIGHTS, BUOYS, AND BEACONS IN THE UNITED KINGDOM.

Name and Designation of Authority.	Source of Income. Cir. III. 42. Cir. V. 14 15.	Total Income and Expenditure in 1886.		Keeper's Salary, Highest.	Cir. II. 2. Number of		Cir. III. 21. Character		Number of Buoys in Position. Cir. V. 5e.	System. Cir. V. 12-13.	Number of Beacons. Cir. V. 10.	Tide Signals. Cir. III. 65. Cir. VI. 11.	Cir. VI. 17-19. Lloyd's Evidence. General Opinion:		
		Income.	Expenditure.		Cir. III. 35.	Shore Lights.	Floating Lights.	D.					C.	As to Efficiency of Lights, Buoys and Beacons.	As to Dues in respect thereof.
18. Inverleithing, Magistrates and Town Council.	Corporation funds.	*	*	*	* ?	0	-	*	* ?	*	*	*	0	0	
19. Irvine, the Harbour Trustees.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
20. Kirkwall, the Harbour Trustees.	Harbour fund.	*	*	0	1	0	Gas and oil	0	0	0	0	*	Unsatisfactory.	Satisfactory	
21. Montrose, the Harbour Trustees.	Harbour dues.	51l.	100l.	0	2	*	Fixed red	1	0	0	0	0	0	0	
22. Musselburgh -	*	*	*	*	*	*	*	1	*	*	*	*	0	0	
23. Perth, the Seamen's Society.	Tonnage dues.	55l.	42l. 9s.	0	0	0	0	0	13	Black, north red, south.	0	0	0	0	
24. Peterhead, the Harbour Trustees.	General fund.	6	*	*	2	*	Catastrophe Holophotal, north Catastrophe, south	0	0	0	0	0	Unsatisfactory.		
25. Port Ellen -	Owner	*	*	39l. and dwelling.	1	0	* C	*	*	*	*	*	0	0	
26. Salt Coals -	*	*	*	*	*	*	*	*	*	*	*	*	0	0	
27. St. David's, G. M. Henderson, of Fife, Fifehire.	Private property.	*	*	*	3	0	D C	4	*	*	*	0	0	0	
28. St. Margeret's Hope, Orkney.*	*	*	*	*	*	*	*	*	*	*	*	0	*	*	
29. Stonehaven -	*	*	0	0	0	0	0	0	0	0	0	0	0	0	
30. Stornoway Lanes	*	*	0	0	0	0	0	0	0	0	0	0	0	0	
31. Troon, Captain R. S. Boleard.	Owner	*	*	52l.	2	0	0 C and large Gas burners without reflectors.	2	Red	0	0	0	Satisfactory	0	
32. Wick, the Harbour Commissioners.	British Fishery Society.	*	*	42l.	1	0	Silverized reflectors.	0	0	0	0	0	Lanterns by night and black by day.	0	0
33. Whitham, the Magistrates and Council of the Borough.	General fund of borough.	*	*	0	0	0	0	0	0	0	1	*	0	0	
IRELAND.															
1. Belfast, Harbour Commissioners.	General income of port.	*	*	27l. 6s.	5	0	D and common lens	2	Entering, black, star board; red, port.	1	0	0	Satisfactory	0	
2. Carlingford Lough, L. Watson, Esq., Warrepoint.	Owner	120l.	*	*	2	0	Oil Oil	5	Entering, black, port, red, star-board.	*	0	0	Ditto	Satisfactory	
3. Carlingford Lough, agent to Lord Clermont.															
4. Cork, Harbour Commissioners.	Harbour revenue.	*	232l.	40l.	2	*	D 0	33	In harbour black and white; in river, black and red.	2	0	0	Unsatisfactory.	*	
5. Donegal -	*	*	*	0	0	0	0	0	0	0	0	0	Unsatisfactory.	0	
6. Drogheda, Harbour Commissioners.	Harbour dues.	*	*	*	3	0	Oil	1	Red	19	0	0	Satisfactory	Satisfactory	
7. Dublin -	Corporation	*	*	*	*	*	*	*	*	*	*	*	0	0	
8. Dundalk, Harbour Commissioners.	Shipping dues.	*	*	*	1	*	*	3	Red	2	*	*	Ditto	Ditto	
9. Galway, Harbour Commissioners.	Port dues.	*	*	*	*	*	*	3	0	0	0	0	0	0	
10. Keemate (River) -	*	*	*	*	*	*	*	*	*	*	*	*	Unsatisfactory.	*	
11. Limerick, Harbour Commissioners.	Harbour dues.	*	*	*	5	*	*	0	0	0	0	0	Ditto	Unsatisfactory	
12. Londonderry, Port and Harbour Commissioners.	ditto	0	632l. 3s. 8d.	33l. 16s.	7	2	Holophotal and lamps with reflectors.	10	Placed to mark Channel.	9	0	0	Not quite satisfactory.	Satisfactory	
13. New Ross -	*	*	*	*	*	*	*	1	*	*	*	*	0	0	
14. Newry, Navigation Commissioners.	Tolls	*	*	*	*	*	*	4	*	5	*	*	0	Satisfactory	
15. Sligo, Port and Harbour Commissioners.	Harbour dues.	0	25l.	*	*	*	*	4	Entering, red, star-board; black, port.	0	*	*	0	0	
16. Strangford, Lord de Ros.	ditto	38l. 14s.	37l. 3s.	*	*	*	*	2	*	5	*	*	0	0	
17. Waterford, the Commissioners for improvement of Port and Harbour.	ditto	*	80l.	*	*	*	*	22	*	1	*	*	Not satisfactory.	Satisfactory	
18. Westport Port and Harbour Commissioners.	*	*	*	*	*	*	*	0	0	0	*	*	0	0	
19. Wexford, Harbour Commissioners.	Tonnage dues.	*	*	*	*	*	*	14	South side black; north side, black and red tops.	4 perches	0	0	Unsatisfactory.	0	
20. Youghal -	Harbour dues.	62l.	*	*	1	*	*	0	0	0	0	0	Ditto	Satisfactory	

ENGLAND.

1. ABERDOVEY.

LLOYD'S EVIDENCE.

- I. Edward Price, Aberdovey, slate shipper, sub-commissioner of pilots, Trinity House buoy agent, and Lloyd's agent, retired master mariner.
- II. ABERDOVEY, CARDIGAN BAY.
- III. No harbour dues. All vessels coming into port loaded, pay in the Custom House halfpenny per ton voyage, outward payable at their port of discharge, unless bound foreign. British ships bound in and out pay double.
- IV. No; a standing light on Aberystwith Pier is much wanted; also a lightship, four miles W. by S., from Carn Badrig Reef.
- XIII. Black buoy at the entrance of the bar, red inside. The form of buoys are can and nun.

2. ABERYSTWITH.

On the 21st of November, 1859, the secretary was directed to forward the following extract from the "Shipping Gazette" to the harbour trustees at Aberystwith, and to say that the Commissioners would be greatly obliged if the trustees would inform the Commissioners whether the statement contained in the extract was substantially correct.

The slip was returned with the following reply:—

Aberystwith,

24th November, 1859.

SIR,
In reply to your communication of the 21st instant, I beg to inform you that the enclosed extract contains a correct statement of the substance of the inquiry to which it refers.

I am, Sir, your obedient servant,

GEO. MORICE,

J. F. Campbell, Esq., Clerk to the Trustees of the
Secretary to the Aberystwith Harbour.
Royal Commission of Lights, &c.
London.

"THE LATE GALE.—INQUIRY INTO THE CONDUCT AND DISMISSAL OF THE ABERYSTWITH HARBOUR MASTER.

"Aberystwith, Nov. 10.

"The harbour trustees of this port—Mr. E. L. Pryse, M.P., Lord Lieutenant, in the chair—held a meeting at the hall, to inquire into the conduct of Mr. Page, the harbour master, on the evening of the 25th ult., for not having exhibited lights on the pierhead after dusk, by which, it was alleged, several vessels were lost. A meeting of shipowners, masters, and others of the port, had previously adopted the following resolutions:—"That it is our decided opinion that, for the future safety of vessels coming into this port, a fixed bright light is essentially requisite to be put up at the extreme end of the pier, and two guide lights on the white marks opposite the entrance to the harbour—the former to be lighted, from sunset to sunrise all the year round, and of such brilliancy as may be seen at a distance of at least 12 miles, and the latter to be lighted from half flood to half ebb every tide."—"That the harbour master, in not exhibiting a light on the pierhead on the night of the 25th ult., after being repeatedly warned that vessels were outside the port, has been guilty of most culpable neglect—a neglect which it is feared has led to mournful results; and while fully appreciating Mr. Page's past services, we are firmly convinced that at the present time, in consequence of age and infirmity, he is wholly incapacitated for fulfilling the onerous and highly important duties pertaining to his office."—A memorial, embodying these resolutions, was signed by 110 shipowners and master mariners.

"The chairman having opened the proceedings, "Captain Davies, master of the brig 'Bessie,' of Aberystwith, said he saw a ship's light about a mile off, from half-past 6 to 7 o'clock on the evening of the 25th ult. There was no light on the pierhead. There was sufficient water

ABERYSTWITH.

for a ship to come in, and he was positive that a vessel could have come in if there had been a light on the pierhead. Watched the light for three quarters of an hour.

"Mrs. Jones, wife of Captain William Jones, said Mrs. Morgan, wife of Captain Morgan, came to their house about half-past 7 on the night of the gale, saying there was a patent light out. Went to the harbour master's, and heard his daughter tell him there was a light out. They were talking about sending for John. In an hour afterwards saw there was no light on the pier, and, with Edward Humphreys, went to the harbour master's. Asked him, 'Where is the light?' and he said something about sending for John. Was positive she saw the light within a very short distance of the pier. At 11 o'clock there was no light visible either on the pier or out at sea.

"Edward Humphreys, mariner, said: About half-past 6 on the night of the 25th, saw the light of a vessel which was coming down towards the pier. There was no light on the pierhead. Saw one man holding a light in his hand. She had three lights, and was sufficiently near to hail her in fine weather. Told Mr. Page that a vessel had been out for two hours, and that it was a pity to see her in such distress. Page said, the only way to have her in was to look for John. Asked who was to pay him, but he went to look for John. Saw the light about half-past 9, and the vessel was pitching about in great distress.

"Captain Enos, master of the 'Victoria' (wrecked at Newquay during the gale of that night), said: We were in company of the 'Margaret Lloyd' and 'Morning Star' (the vessels lost) on the morning of the 25th, from St. Tudwell Roads. The 'Britannia' (also lost); the 'Swansea Trader,' of Aberystwith; the 'Eliza Mary,' of Newquay; and others, were also with us. The last time I saw the 'Margaret Lloyd' was between 5 and 6 o'clock in the evening, opposite Pendenis. I was three quarters of a mile to leeward of her; wind E.N.E. In about three quarters of an hour afterwards, when it was quite dark, and the storm increasing, I saw the lights of the 'Margaret Lloyd' in such a position as would enable her to fetch the harbour in safety. If there had been a light on the pier I am positive she would have been in. I should have made an attempt myself to come in if there had been a light. The 'Morning Star' would also have attempted to come to this harbour if the lights had been exhibited. I showed a light occasionally myself. All the vessels but the 'Margaret Lloyd' were to leeward of me. There was plenty of water, and I had no doubt in my own mind but that the 'Margaret Lloyd' was safely in the harbour by 7 o'clock.

"Captain Rees, of the 'Britannia,' said he saw the 'Margaret Lloyd' tacking for the bar, and there was sufficient water, and he saw her lights in such position as would enable her to enter the bar.

"Mr. Watkins, mate of the 'Bessie,' said he saw the light on the evening of the 25th, about three quarters of a mile distance. She could have been in had there been lights on the pierhead. Saw the light from half-past 6 to 10. She was tacking about as if in great distress. No light was exhibited on the pierhead.

"Mr. Page was then called upon for his answer, and he said that on the evening in question, about half-past 6, Humphreys called upon him, and said there was a light out at sea, and he asked him to go and tell John. Waited all the evening watching for the appearance of the lights. It was the duty of John Davies and Thomas Davies to put up the lights. They were employed for that purpose. Did not send a messenger to John Davies to know the reason why the lights were not put up. Looked seawards, and saw no lights out at sea; and if there were a vessel so near on that night as had been stated, she must have gone on shore. Seeing no lights out at sea, nor any exhibited on the pierhead, went to bed at 10 o'clock, under the impression that all was right.

"John Davies said no one ever told him to put up the lights that night, and he saw no light out at sea.

"Thomas Davies, the other servant, said he saw no light.

"The trustees then retired, and, after some consultation, the chairman said: Mr. Page, it now becomes my painful duty to give the result of the deliberations of the trustees in this unfortunate matter, which I will do by simply reading the resolution passed. Painful, I say, because, so far as I

ABERYSTWITH.
Correspondence, &c.
Commissioner

ABERYSTWITH AND ADMIRALTY.

understand, you are an old and valued servant of the trustees, and no complaint had ever before been laid against you, and the trustees are all extremely sorry for the present unhappy occurrences which have led them to pass the following resolution:— It is unanimously resolved, that the trustees are of opinion that on the night of the 25th ult. the harbour master was guilty of gross neglect of duty in not putting up the pier and guide lights, and that he be forthwith dismissed.

With regard to the future lighting of the pier, referred to in the memorial, it was resolved that the whole subject be referred to a committee."

3. ADMIRALTY.

No General Return has been furnished by the Admiralty.

BEREHAVEN, BANTRY BAY.

LLOYD'S EVIDENCE.

- I. Robert Puxley, Oak Lodge, Castletown, Berehaven, agent to Lloyd's, and purser to the Berehaven Mining Company.
- II. BEREHAVEN, BANTRY BAY.
- III. The Lords of the Admiralty, London; the Trinity Board, London; the Ballast Board, Dublin. The Ballast Board, subject to the Trinity Board, have control over the Roan Carrig light, the Hornet Buoy, and the perch on Dog Rock and Sound Rock. The other buoys were supplied by and are kept in repair by the Admiralty.
- IV. Not sufficiently lighted, buoyed, or beacons.
- V. The position and size of existing buoys and beacons, and the colour of the light on Roan Carrig is good; but additional lights, buoys, and beacons, are indispensably requisite. See answer No. VI.
- VI. I would strongly recommend a light to be placed on the tower recently erected on the west end of Bere Island. It would be visible to vessels sailing from north or west, when Roan Carrig light would not be perceptible. The west entrance would then be safe of ingress or egress with favourable winds, and the risk of sailing round Bere Island would be avoided. A blind harbour (Pulleen) very much resembling, and near to, has been frequently mistaken for the west entrance to Berehaven. A light, which it is intended to erect on the Calf Rock off Dursey Island, I would recommend to be placed on the Bull Rock. To a vessel sailing from a northerly direction, the view of a light on the Calf may be intercepted by the Bull and the consequence be fatal. In a storm the Calf is completely washed; it will be difficult to erect a tower on it, and when erected, more liable to destruction. The Bull is sufficiently high to be safe; I will furnish some materials—sufficient space for a dwelling and yard; possesses all the advantages, but not the disadvantages, of the Calf. A beacon (perch) 25 to 30 feet high, with a barrel head, on the east point of the Colt Rock off Dunbay Castle, and a similar one on Privateer Rock, I consider indispensable. Both are half-tide rocks in deep water, and on which vessels are very liable to strike; and a bell buoy to be placed near each the Ducallow Rock and the Dog Rock, both near the eastward entrance, and very dangerous.
- VII. Rape oil.
- VIII. The Roan Carrig light, the only one on this part of the coast, has been uniformly exhibited since it was first lighted.
- IX. About two years since, a buoy near the Dog Rock was destroyed by a storm; not replaced since.
- X. The schooner "Eliza," of Milford, was wrecked on the Dog Rock in the spring of 1852. The "Amphitrite," C. G. Cutter, struck on the Colt Rock in daylight; was injured and very nearly lost. Her Majesty's ship "Trincola," struck on the Privateer Rock, lost her false keel, was otherwise injured, and with much difficulty was got off. The brig "Martin," of Limerick, the "David Grant," of Arbroath and other vessels have mistaken Pulleen, a blind harbour, much resembling, and near to, for the westward entrance of Berehaven; and some fishing boats and whole crews have been lost on the Ducallow.
- XI. None are used or required.

BEREHAVEN, BANTRY BAY.

ADMIRALTY.

- XII. There are none in use; two are requisite, viz., one near the Ducallow Rock, and one near the Dog Rock. I would recommend bell buoys.
- XIII. The Harbour Buoy at westward entrance, red; Sir Walter Scott Buoy white; Volage Buoy white; Hornet Buoy black, and name painted white; Curryglass Buoy black. The beacon or perch on Sound Rock, entrance to basin or inner harbour, cone-headed, black. Perch on the Dog Rock black. The buoys are inverted cones. White buoys to be kept on the north.
- XIV. See answers Nos. VI. and VIII.
- XV. None that I am aware of.
- XVI. There has not been any concerning the management, but several have been, as to the insufficiency, with reference to the Dog, Ducallow, Colt, and Privateer Rocks.
- XVII. The general feeling is most decidedly that the existing lights, buoys, and beacons are good, but insufficient in number for safe navigation. Mariners very much dread the Ducallow—a very treacherous rock, and the Dog Rock, a long, dangerous reef.
- XVIII. There is no grievance to complain of.
- XIX. There are no local dues.
- XX. The opinion is, that the lights, buoys, and beacons in existence are well managed.

DEPTFORD.

Deptford Yard,
18th February 1860.

GENTLEMEN,
The Lords Commissioners of the Admiralty having directed me to fill up the enclosed forms, and transmit them to you, I beg to state that there are no buoys, beacons, or lighthouses at this port or part of the Thames.

I have, &c.

(Signed)

C. H. M. BUCKLE,
Captain Superintendent.

The Commissioners on
Lights, Buoys, and Beacons.

DEVONPORT. See PLYMOUTH, p. 287.

PEMBROKE.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Pembroke dockyard.
- II. Captain Superintendent of Pembroke Dockyard.
- III. Ditto.
- IV. Two, north 58° west, magnetic, 377 yards apart.
- V. None.
- VI. Dockyard.
- VII. For a leading mark from off Milford to clear the Weave.
- VIII. February 21st 1856.
- IX. Coloured glass inserted in the lamps.
- X. Harbour.
- XI. Two gas lamps.
- XII. None.
- XIII. Fifteen feet and twenty-five feet.
- XIV. Eighteen and thirty feet.
- XV. No sea horizon.
- XVI. One and a half to two miles.
- XVII. North 55°, west to north, 60° west Mag.
- XVIII. Fixed red.
- XIX. None.
- XX. Sunset to sunrise.
- XXI. Red glass inserted in the lamps.
- XXII. None.
- XXIII. None.
- XXIV. None.
- XXV. None.
- XXVI. None.
- XXVII. None.
- XXVIII. None.
- XXIX. None.
- XXX. None.
- XXXI. Two dockyard lamps.
- XXXII. None.
- XXXIII. None.
- XXXIV. Annually by dockyard.
- XXXV. None.
- XXXVI. None.
- XXXVII. None.
- XXXVIII. 26,280 cubic feet per lamp per annum, at 4s. per 1,000 cubic feet.
- XXXIX. None.

PEMBROKE.

- ADMIRALTY.
Circular III.
- XL. None.
 - XLI. None.
 - XLII. Dockyard.
 - XLIII. None.
 - XLIV. None.
 - XLV. None.
 - XLVI. None.
 - XLVII. None.
 - XLVIII. None.
 - XLIX. None.
 - L. Dockyard lamplighter.
 - LI. Daily.
 - LII. No.
 - LIII. None.
 - LIV. None.
 - LV. None.
 - LVI. None.
 - LVII. No keepers; in charge of the police.
 - LVIII. None.

BUOYS AND BEACONS.

- ADMIRALTY.
Circular V.
- I. Captain Superintendent Her Majesty's Dockyard, Pembroke.
 - II. See tracing.
 - III. Admiralty.
 - IV. Captain Superintendent; Queen's Harbour-master.
 - V. See tracing.
 - a. Wood and iron.
 - b. 13*l.* 10*s.*, and 10*l.* 10*s.*
 - c. Depends so much on circumstances that it cannot be exactly given.
 - d. 10*s.*
 - e. Six.
 - f. Two of each size.
 - g. All in the dockyard.
 - h. None.
 - i. One.
 - j. Shackle bolt falling out.
 - k. Two anchors with ground chain, a ring in the centre, and pendant and swivel to the buoy.
 - l. 46*l.* 3*s.*
 - m. Repaired in the dockyard.
 - n. Its colour.
 - o. Six.

VI. Can.

VII. Examined once a year, and taken to be repaired when necessary.

VIII. Dockyard cooper examines.

IX. See tracing.

X. One.

- a. Carrs beacon buoy.
- b. Do not know.
- c. To mark extreme of Carrs.
- d. By its beacon.
- e. Iron pole, with metal ball. See tracing.
- f. Black, with a white ball.
- g. Not lig. ted.
- h. Eight feet.
- i. Cannot tell.
- j. Cannot tell.
- k. None.

XI. Have not substituted any.

XII. None.

XIII. None.

XIV. Dockyard.

XV. Dockyard.

XVI. Nothing.

XVII. None.

XVIII. None.

XIX. Queen's Harbour-master; as other duties permit.

XX. By Queen's Harbour-master.

XXI. It is immediately replaced.

XXII. Queen's Harbour-master.

XXIII. Immediately informing the Captain Superintendent.

XXIV. None made.

- a. Two anchors; ground chain, with ring in the centre, and pendant and swivel to the buoy.
- b. Wood and iron.
- c. Can.
- d. 7 feet six inches by 5 feet 6 inches; and 6 feet by 4 feet.
- e. Black, one white, and one red.
- f. None.
- g. None.
- h. None.
- i. None.
- j. None.

PEMBROKE.

- k. Placing the buoys on extremes of shoals.
 - l. None.
 - m. None.
 - None.
- XXV. None.
- XXVI. Have none.
- XXVII. Have none.

ADMIRALTY.

Circular V.

PLYMOUTH.

LIGHTHOUSE.—(SPECIAL RETURN.)

Circular III.

- I. Breakwater, Plymouth.
- II. Trinity House, London.
- III. Mr. Ditcham, Cosside, Plymouth.
- IV. One large and one small.
- V., VI. Apply to Trinity Board.
- VII. To prevent vessels running on west end of Breakwater entering the Western channel.
- VIII. 1st June 1844 or 1845.
- IX. Walker and Burgess.
- X. Sea.
- XI. Granite.
- XII. Yes; common principle.
- XIII. About 77 feet.
- XIV. 1st light, 70 feet; 2d, 60 feet.
- XV. About 12 miles.
- XVI. Never observed; but I consider from 10 to 12 miles.
- XVII. Never observed.
- XVIII. Fixed light. Red to seaward, and white showing the anchorage.
- XX. From sunset to daylight.
- XXI. to XXV. Apply to Trinity Board.
- XXVI. A bell.
- XXVII. to LVIII. Apply to the Trinity Board.

BUOYS AND BEACONS.

Circular V.

- I. Officers of Devonport Dockyard.
- II. Chart of Plymouth Sound herewith sent. The harbour master's jurisdiction is within the two red lines.
- III. The Admiral Superintendent, Devonport Dockyard.
- IV. Not any.
- V. The buoys are not classified; they are of one size. Sketch herewith sent.
 - a. Wood.
 - b. 27*l.* 12*s.*
 - c, d. 1*l.* 5*s.*
 - e. Seventeen.
 - f. Seventeen.
 - g. Devonport Dockyard, the whole of them.
 - h. Seventeen.
 - i. None.
 - k. With anchors.
 - l. 52*l.* Composed of old chain cable, and valued as worn chain.
 - m. Procured from dockyard and repaired there.
 - n. None but the colour, viz., black, white, red, and chequered.
 - o. Seventeen.
- VI. Conical.
- VII. Repaired annually.
- VIII. Examined annually at dockyard.
- IX. One on the east end of breakwater. One on the Hoe, white and red chequered.
- X. a, b. None; the above beacons belong to the Trinity Board, to whom application should be made.
 - c. One to keep ships clear of east end of breakwater. One to guide ships through the deep water channel under the Hoe.
 - d. One black, with the other chequered red and white.
 - e. Stone and wood.
 - f. No. 1, stone pedestal with a staff and black ball. No. 2, stone obelisk, chequered red and white, horizontal.
 - g. No.
 - h, i, j, k. Apply to the Trinity Board.
- XI. No change has been made here for years.
- XII. Entering the eastern channel from the southward; red buoys on the starboard hand, white and chequered black and white on the port side; beyond this there is no general rule.
- XIII. None.
- XIV. They are kept in repair by the Admiralty, and dues are not collected on their account.

PLYMOUTH.

PORTPATRICK.

ADMIRALTY.

Circular V.

- XVII. Not any.
 XVIII. Not any.
 XIX. By the Queen's Harbour Master in August of each year.
 XXI. Not any necessary, as the buoys, if disturbed, would be immediately replaced.
 XXH. Yes; the Queen's Harbour-master.
 XXIII. By letter or viva voce, as the case may be.
 XXIV. to XXVII. Not any.

PORTPATRICK.

SIR, Portpatrick Harbour, 27th February 1860.
 IN compliance with the directions of my Lords Commissioners of the Admiralty I beg to transmit the accompanying chart and returns duly filled up for this harbour.
 I have, &c.
 (Signed) EDW. HAWES, *
 The Secretary Royal Commission Capt. R.N.
 on Lights, Buoys, and Beacons.

time, and then passed to the Northern Light Commissioners, by whom De Ville's apparatus was removed, and the Bude light adopted instead. The light continued to be exhibited from the new tower till January 1839, when, in a heavy storm, the pier head was breached, and the light tower undermined. The light was of necessity extinguished, and that in the old tower, with its inferior apparatus resumed and continued till the final extinction, December 1852.

The pier head was repaired by 1842, and the tower rendered more secure than before; but the light has never been re-lit.

A heavy sea breaks over the tower in gales, and, if used there should be two light-keepers to relieve each other, and a passage to the entrance door covered over.

There is no apparatus in the tower now.

I am, &c.

(Signed) EDW. HAWES, Capt., R.N.,
 General Superintendent.

Admiral W. A. B. Hamilton,
 President Royal Commission
 on Lighthouses.

Circular 11.

SIR, Portpatrick Harbour, February 1860.
 I BEG leave to submit the following statement in reference to the lighthouses at this harbour.
 There are two lighthouses on the south pier at this harbour.
 The inner or old tower at the eastern end of the pier, on a site which was formerly the sea extremity of the works.
 The new or outer tower at the pier head of the south pier, and 391 feet seaward or in advance of the old one.

OLD TOWER.

The period at which the old tower was erected is not known. A peat fire was originally burnt on the site of this tower, as early probably as 1680, as a guide to the small craft then employed for the Post Office service. The tower and light were known to exist in 1760. In 1774 the pier—"Old pier,"—adjoining the tower, was repaired by "Smeaton" by a grant from the Post Office, and it is probable the light tower was built under that department.

The tower is small, exceedingly cramped, is of small whinstone and lime, coated with lime and sand, and although painted or coloured annually takes damp.

The light chamber is 6ft. 6in. in diameter and 6ft. 10in. in height, is of a hexagonal form. The glazed lantern four feet in height, with an arch formerly of 160, but increased by us to 204, to admit the light further round the tower.

The light apparatus consisted of mirror glass fixed in parabolical moulds of plaster as reflectors, 6 lamps with broad wicks but without glass chimnies, and the glazing of the lantern consisting of small panes of common window glass, with a mass of woodwork framing, forming a very inferior light, and which we felt it to be during the Packet Service. This tower and light were under the management of the Northern Light Commissioners. It was discontinued between December 1836 and January 1839, while the new lighthouse was in use. In January 1839 this old tower was again lit by the Northern Commissioners, but with the same inferior apparatus, and continued burning till December 1852, when it was finally extinguished by that Board, and the materials of the light removed. After a long correspondence on the part of the Treasury, Admiralty, and the Commissioners relative to the light being removed to the new tower, January 1853, the old tower passed to the charge of the Admiralty, and was re-lit October 1856, with the dioptric 6th order apparatus now in use. The lantern remains the same, there being the possibility of the new tower being used as soon as the Packet Service is resumed.

NEW TOWER.

The new lighthouse on pier head was built by Sir John Rennie, C.E., under the Commissioners for the harbour, and under their establishment, by day-labour work. It is of the best description of the Anglesea limestone, closely jointed, the masonry at the base being 4 ft. 4 in. thick, has a commodious stone staircase, a storeroom on the ground floor, and is a superior edifice. It was completed in 1836, when De Ville's superior apparatus was fitted in it, and the light exhibited December 1836.

The light chamber is 5 ft. 10 in. in diameter, 8 ft. 6 in. in height, and the glazing of the lantern 4 ft. 6 in. in height, and round the entire circle the glass of a superior kind, the panes 18½ inches square.

The light was altogether of a superior character, and was exhibited, under the Harbour Commissioners, for a short

LIGHTHOUSE.—(SPECIAL RETURN.)

Circular

- I. Portpatrick Harbour, Scotland.
- II. Admiralty, Harbour Department.
- III. Captain Hawes, R.N., General Superintendent under Admiralty.
- IV. Two lighthouses; but only one lit, which is the inner or old tower. New tower stands on south pier-head, 391 feet in advance.
- V. Unknown.
- VI. Unknown.
- VII. For the old tower unknown, but probably from its position, being the outer part of the then pier, and well situated. New tower, from its more seaward position.
- VIII. Old tower unknown; probably before 1750. First under the Admiralty, October 1856. In new tower, December 1836 till January 1839.
- IX. Old tower unknown. New tower, Sir John Rennie. Day labour, under Harbour Commissioners.
- X. Harbour.
- XI. Old tower, solid of whinstone and lime, coated with rough-cast, white. New tower, Ashlar limestone, solid, colour of the stone; not coated.
- XII. No.
- XIII. Old tower, 37 feet; new tower, 54 feet.
- XIV. In old tower, 40 feet.
- XV. Old tower light, 9 to 10 miles in very clear weather, 7 to 8 in moderate clear weather.
- XVII. Old tower light; horizontal sea range 137° from S, by W. ¼ W. to N.N.W. ½ W., with additional 67° to N.E. ½ N. in harbour.
- XVIII. Fixed and natural.
- XIX. XX. Nil.
- XXI. Dioptric.
- XXII. Sixth.
- XXIII. Original apparatus in old tower was mirror reflectors, six lamps without chimnies, done away with in 1852, when tower passed to Admiralty; relit, with present apparatus October 1856. "See special statement."
- XXIV. Present dioptric, Mr. Wilkins, 25, Long Acre, London.
- XXV. Tunnel in top of cupola and door in lightroom with moveable circular ventilator.
- XXVI. None in use since packet service terminated.
- XXVII. Nil.
- XXVIII. Nil.
- XXIX. Not known.
- XXX. Finished.
- XXXI. Dimension of lantern:—

Old tower.		New tower.	
Diameter	6 ft. 6 in.	-	5 ft. 10 in.
Height of chamber	6 ft. 10 in.	-	8 ft. 6 in.
Glazing	4 ft.	-	4 ft. 6 in.
Cost unknown.			
- XXXII. No.
- XXXIII. Repairs before building came under Admiralty unknown; since 1853 none.
- XXXIV. Annual cost of painting lanterns and rails of both lighthouses, and colouring walls of old tower, about 4l. 10s., and done by Harbour Establishment.
- XXXV. One keeper, wages 1-ls. per week.

ADMIRALTY.
Circular III.

PORTPATRICK.

- XXXVI. Price unknown. Fitting in tower, 10s.; carriage from London, 1*l.* 8*s.* 8*d.*
 XXXVII. Apparatus nil.
 Articles for lighthouse in 1857, 1*l.* 7*s.*; 1858, 5*s.*
 XXXVIII. 1857, oil, 47½ gallons; wick, 9 dozen.
 1858 „ 51 „ „ 12 „
 XXXIX. Best colza oil, 1857, 5*s.* 6*d.* per gallon.
 „ „ 1858, 5*s.* and 4*s.* 9*d.* per gallon.
 XL. Cotton, circular, ¾ inch diameter. 1857, supply came with apparatus. 1858, 4*s.* 6*d.* per 12 dozen. Annual cost, 4*s.* 6*d.*
 XLI. None in use.
 XLII. Grants from Parliament for maintaining harbour; to Admiralty.
 XLIII. Nil.
 XLIV. 1858. Wages - - - £36 10 0
 Oil, wick, stores, and carriage 13 10 0
 Painting, &c. - - - 13 15 0
 Total - - - £63 15 0
- XLV. Nil.
 XLVI. Nil.
 XLVII. Nil.
 XLVIII. Nil.
 XLIX. Nil.
 L. By superintendent of harbour, who is always on the spot.
 LI. Frequently.
 LII. No.
 LIII. One spare lamp, with glasses, kept in harbour office. Oil supplied in quantities less than 20 gallons, and kept in store, floor of lighthouse.
 LIV. None.
 LV. None used. Harbour, since termination of packet service, has been nearly in disuse.
 LVI. None; reason as above. When harbour is again used, the new code of signals should be furnished.
 LVII. Only one, who is on duty through the night.
 LVIII. The light to be shown from sunset to sunrise; the exact time of lighting and extinguishing may, however, vary a little according to state of weather and atmosphere; the light to be kept clear and good. Great attention to trimming, and to keep glass of lantern clear; the lamp to be trimmed, apparatus and lantern in perfect order by noon, or 2 p.m., and anything requiring attention to be immediately reported to superintendent of harbour.
 A register kept of time of lighting and extinguishing, and hour burning; also of oil, wick, and other stores received and expended.
 The lightkeeper at present keeps a meteorological return for Board of Trade.

BUOYS AND BEACONS.

- I. Captain Hawes, R.N., General Superintendent of Portpatrick Harbour.
 II. Chart of harbour by E. Calver, R.N., 1857. Two buoys of log timber, placed temporary to mark limit of shoal water, and lead to basin, until proposed deepening of harbour is effected. One pole beacon for same purpose. Annual cost of maintaining them is about 1*l.*
 III. To the Admiralty.
 IV. The Admiralty are conservators of the harbour, under Lords of Treasury.
 V. One kind only used,—of common log timber.
 a. Log timber, trunnelled and bolted together.
 b. About 15*s.*
 c., d. For both buoys, about 10*s.* or 12*s.*
 e. Two.
 f. One.
 g. Harbour storeyard, one.
 h. One.
 i. The outer buoy displaced by sea in 1858, but replaced immediately.
 j. Heavy sea in the harbour.
 k. Chain clenched into Ashlar stone of great weight, or to iron weights.
 l. Nil.
 m. Made and repaired by harbour establishment.
 n. These buoys are within the harbour, which is so contracted that no mistakes can occur.

II.

PORTPATRICK.

- VI. These buoys are only suited for the temporary purpose and position to which they are applied.
 VII. These buoys are changed every summer to dry and recast with coal tar, and remove the effects of the worm, which is very destructive.
 VIII. The above.
 IX. Only one small pole beacon, placed temporary on the ground where old pier stood; until alterations in harbour are carried out.
 X. Only one, as above.
 b. 1856.
 c. To denote shoal ground where old pier stood.
 d. Seen above high water, and the only one.
 e. Wood pole.
 f. White, crossed red.
 g. No.
 h. About 24 feet to top of cross.
 i. Materials from harbour stores, value and labour 3*l.* 10*s.*
 j. in 1858 about 5*s.*
 k. None.
 XI. This harbour is at present nearly in disuse. The buoys and beacons are merely temporary to mark the shoal ground on the south side of the harbour, until contemplated improvements are carried out, when the packet service will be resumed. The buoys, if any, that may then be required, should be of the most approved kind.
 XIV. From grants made by Parliament for maintenance of harbour, through the Admiralty.
 XVI. Income, nil; expenditure in 1858, 11*s.*
 XVII. Nil.
 XVIII. Nil.
 XIX. Captain Hawes, the General Superintendent of the harbour; frequently.
 XX. Same.
 XXI. When buoy is displaced by gale it is immediately replaced.
 XXII. Yes, instantly, if weather permits.
 XXIII. The officer in charge of the harbour has power to keep these buoys and beacons in place; if any extra expense is required, he would refer to Admiralty.
 XXIV. Nil.
 XXV. None. The circumstances of this harbour does not give a field for such improvements.
 XXVI. None, further than removing each buoy in summer as stated in No. VII.

ADMIRALTY.
Circular V.

PORTSMOUTH.

Circular III.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Southsea Castle.
 II. Admiralty.
 III. Master Attendant, Her Majesty's Dockyard, Portsmouth.
 IV. One light only.
 V., VI. Unknown.
 VII. For leading through the Channel between the Horse and Spit Sands.
 VIII. 1822, rebuilt in 1854 and raised 20 feet.
 IX. By contract. Joseph King, Contractor, of Portsea, 1854. II. Wood, Engineer, Dockyard.
 X. Harbour.
 XI. White.
 XII. Fitted on.
 XIII. Forty-six feet from terre pleine of Castle.
 XIV. Fifty-one feet.
 XV. Seven miles.
 XVI. Eleven and half miles.
 XVII. From S. by W. to W. ½ S.
 XVIII. Fixed.
 XX. From sunset to sunrise.
 XXI. Dioptric.
 XXII. One burner.
 XXIII. 1854; altered from a white and red to a green and red light, agreeably to directions of the Lords Commissioners of the Admiralty.
 XXIV. Mr. Wilkins, Long Acre.
 XXV. Open lantern in ball.
 XXVI. None.
 XXIX. Cost of lighthouse, 235*l.*; the adjoining buildings and site are in the possession of the War Department.
 XXX. Complete.
 XXXI. Included in cost of building.

O O

PORTSMOUTH.

ADMIRALTY.
Circular III.

- XXXII. Not purchased.
 XXXIII. Erected in 1854. No repairs required since.
 XXXIV. Annual cost of painting lighthouse, 2*l.* 10*s.* Work done by contractor for ordinary repairs.
 XXXV. 10*l.* per annum.
 XXXVI. Dioptric lamp, 123*l.* 17*s.* 4*d.*; cost of fitting, 3*l.* 2*s.* 6*d.*; cost of transport, 7*s.* 1*d.*
 XXXVII. 5*l.* 3*s.* 4*d.*
 XXXVIII. Oil, 174 gallons; cotton wick, 60 yards.
 XXXIX. Sperm, at 6*s.* 3*d.* per gallon.
 XL. Tape wick, at 5*d.* per yard, 1*l.* 7*s.* 6*d.*
 XLI. Government.
 XLII. None.
 XLIII. None.
 XLIV. 16*l.* for old lighthouse in 1852, which was pulled down and re-erected in 1854; 2*l.* 10*s.* in 1858.
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. Master Attendant.
 LI. Quarterly.
 LII. No.
 LIII. One spare lamp and burner. Under the stairs on the basement of the lighthouse.
 LIV. None.
 LV. None.
 LVI. Not requisite.
 LVII. Never.
 LVIII. To burn light from sunset to sunrise.

Circular V.

BUOYS AND BEACONS.

See also pages 5, 43, 49.

- I. Master Attendant, Her Majesty's Dockyard, Portsmouth.
 II. Three beacons and 38 buoys.
 III. Admiralty.
 IV. None.
 V. Sketches herewith.

	1st Class.	2d Class.
b.	£40 1 5	£29 0 0
c.	2 10 0	2 0 0
d.	0 2 6	0 2 6
	average.	average.

- e. Thirty-six first and two second class.
 f. Twenty-two first and two second class.
 g. Her Majesty's Dockyard.
 h. Four.
 i. None.
 k. Sinkers, 32 cwt. 2 in. chain, 8 fathoms, 1½ in. 8 fathoms, 1½ in. 1½ fathoms; in 5 fathoms of water.
 l. 2*sl.* 15*s.*
 m. By the dockyard.
 n. Colour. Spit buoy, a beacon and bell; S.W. buoy off the Shingles, a bell; N.W. buoy off the Bramble, a triangular beacon.
 o. Two.

- VI. Can buoy.
 VII. Yearly.
 VIII. Yearly.
 IX. Not.
 X. Three.

- a. One harbour channel, and two swatch.
 b. Unknown; re-erected in 1841.
 c. One for the harbour channel and two for the swatch way.
 d., e., f. Swatch way, one red, one black; harbour channel, red in transit, with a black mask on Blackhouse Fort.
 g. Not lighted.
 h. About 70 feet.
 i. Unknown; cost of re-erection, 1841.
 j. 2*l.*
 k. None.

- XIV. Government.
 XV. Ditto.
 XVI. None.
 XVII. None.
 XVIII. None.
 XIX. Master Attendant, quarterly.
 XX. Yearly.
 XXI. By printed notice.
 XXII. No.
 XXIII. By letter.
 XXIV. None.
 XXV. None.
 XXVI. None.
 XXVII. None.

SHEERNESS.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Garrison Point, Sheerness.
 II. The Lords of the Admiralty.
 III. Captain Superintendent of dockyard.
 IV. One light.
 V. During the winter of 1858.
 VI. Captain of steam reserve.
 VII. To show the entrance of the harbour.
 VIII. 1st March 1859.
 IX. Erected by the clerk of the works of Sheerness yard.
 X. Harbour light.
 XI. A red lantern on the coastguard flagstaff at Garrison Point.
 XII. No conductor.
 XIII. The light is 26 feet above high-water spring tides.
 XIV. About five miles.
 XV. This light cannot be seen in clear weather more than six and a half miles.
 XVI. 112° from N. to E.S.E.
 XVII. A gaslight, enclosed by common plate glass coloured red.
 XIX. Fixed.
 XX. Fixed.
 XXI. None.
 XXII. None.
 XXIII. First lighted in March 1859.
 XXIV. None.
 XXV. Holes in top of lantern.
 XXVI. None.
 XXVII. None.
 XXVIII. None.
 XXIX. None.
 XXX. Finished.
 XXXI. Size of lantern, 2 feet 7 inches by 2 feet 7 inches; whole cost 15*l.* 10*s.*
 XXXII. Light shown from a mast.
 XXXIII. Nil.
 XXXIV. Nil.
 XXXV. None.
 XXXVI. Nil.
 XXXVII. Nil.
 XXXVIII., XXXIX., XL. This lantern is lighted with gas, at a cost of 1*s.* a night.
 XLI. None.
 XLII. The gas is paid for by the Admiralty.
 XLIII. Nil.
 XLIV. Nil.
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. Light first shown in 1859.
 LI. None.
 LII. First lighted in March 1859.
 LIII. None.
 LIV. None.
 LV. None.
 LVI. None.
 LVII. None.
 LVIII. The lamplighter of the dockyard has orders to light this lamp at sunset and put it out at sunrise, every day throughout the year.

BUOYS AND BEACONS.

- I. Mr. Joseph King Martyn, Master Attendant, Sheerness Yard.
 II. Chart enclosed. No cost in 1852; in 1858 the cost was 1*8s.* No income.
 III. Responsible to the superintendent of the dockyard.
 IV. None.
 V. Only one description used, sketch enclosed.
 a. Wood.
 b. 11*l.* each.
 c. 8*s.* 6*d.* each.
 d. 9*s.* 6*d.* each.
 e. Two.
 f. One.
 g. One kept in the dockyard.
 h. One.
 i. None.
 j. None.
 k. With a block of stone and a chain bridle.
 l. 5*l.* 1*8s.* 5*d.*
 m. Made and repaired at the dockyard.

SHEERNESS.

- n. In this case the buoy can be identified only by the colour of the paint.

o. Two.

- VI. A large nun buoy, made of iron in all cases.
- VII. The two buoys here referred to are changed every year and overhauled.
- VIII. These buoys are overhauled once a year by a shipwright and caulker.
- IX. Only one kind of beacon used.
- X. Three beacons placed on Grain Island, as marks for entering the harbour.
- a. Grain Island beacons.
- b. About the year 1830.
- c. To lead into Sheerness harbour, between the Middle and Cant shoals.
- d. Two black and one white.
- e. Wood.
- f. Two black and one white.
- g. Not lighted.
- h. The two black ones 30 feet, the white one 35 feet.
- i. Not known.
- j. Not known for 1852. No cost for 1858.
- k. None.
- XI. No alterations made.
- XII. The two buoys here referred to were placed to assist the yard pilots in keeping clear of the edges of Grain Spit and the Cant Shoal.
- XIII. The beacons here referred to were placed to show the deep-water channel.
- XIV. The dockyard.
- XV. The dockyard.
- XVI. Not known for year 1852. None for the year 1858.
- XVII. No application made.
- XVIII. None.
- XIX. These buoys are shifted and inspected annually by the master attendant or his assistant.
- XX. Annually, by the master attendant or his assistant.
- XXI. None.
- XXII. Yes.
- XXIII. Verbal report.
- XXIV. None.
- a., b., c., d., e., f., g., h., i., j., k., l., m. None.
- XXV. No alterations have as yet been proposed or suggested.
- XXVI. None.
- XXVII. None.

LLOYD'S EVIDENCE.

- I. W. W. Bentham, Sheerness and Rochester; Lloyd's and ship agent.
- II. SHEERNESS and the PORT of ROCHESTER.
- III. Robert A. Norman, Collector of Customs and Collector of Lights, Rochester.
- IV. Yes.
- V. None.
- VI. None.
- VII. A new fixed light at Garrison Point, Sheerness; supplied with gas, first lit 1st March 1859, by direction of the Lords of the Admiralty, being at the entrance of the river Medway. It is 45 feet above low water mark. The gas is supplied from the Dockyard pipe.
- VIII. No.
- IX. No.
- X. None.
- XI. No.
- XII. No.
- XIII. All the same as they have been for years.
- XIV. No.
- XV. Dues for the Nore lights, paid to the Collector of Customs, Rochester.
- XVI. None that I am aware of.
- XVII. I believe mariners are quite satisfied therewith.
- XVIII. I have not heard of any complaint.
- XIX. Yes, I believe they are.
- XX. I believe the general opinion is that they are satisfactorily managed.

WOOLWICH.

BUOYS AND BEACONS.

(Not any at this Dockyard.)

Woolwich Yard,

18th February 1860.

SIR,
WITH reference to your minute of yesterday's date, on their Lordships' order of the 16th instant, directing the

WOOLWICH.

accompanying form to be filled up and transmitted, I beg to inform you, that we have no buoys and beacons, or lighthouses, under my jurisdiction at this dockyard.

I am, &c.,

JNO. McDONALD,

Master Attendant.

The Commodore Superintendent.

4. ALDBRO'.

LLOYD'S EVIDENCE.

- I. George Kersey, Aldbro', Suffolk, Trinity pilot.
- II. ALDBRO'. The harbour is very bad, being a bar harbour; the entrance 12 miles S.W. of the town. At Aldbro' Quay the river is 200 yards from the sea, and a depth of 25 to 30 feet at low water in the river.
- III. None.
- IV. Quite sufficient.
- V. I should suggest the buoy on Sizewell Rock be red, as there are no other between that and the Whiting Sand, or a better noose than it now is, for it cannot be seen now with a high sea running.
- VI. None.
- VII. Oil.
- VIII. None that I am aware of in this vicinity.
- IX. None.
- X. None.
- XI. Candles are put in the beacons to enter the harbour in very fine weather and free wind, as the tide sets right across the channel.
- XII. The same as are generally used.
- XIII. There are no buoys. The beacons black and white.
- XIV. A buoy at the entrance is requisite.
- XV. A yearly sum, I believe, is paid to the harbour-master for beacons and keeping such in repair.
- XVI. None.
- XVII. None respecting lights, buoys, or beacons, but the general opinion of all is that a new cut might be made into the river being so near the sea and a good harbour of refuge.
- XVIII. Not at all heavy.
- XIX. Yes.
- XX. The opinion is that every possible attention is paid to all buoys, lights, and beacons along this coast by the Honourable Trinity Board.

I. J. S. Gibson, Aldbro', Suffolk, Trinity pilot.

II. ALDBRO', the harbour of which is very bad, being a bar harbour; the entrance 12 miles S.W. of the town. At Aldbro' Quay the river is only 200 yards from the sea, and a depth of 25 and 30 feet at low water in the river.

III. None whatever.

IV. Yes.

V. The buoy on Sizewell Bank is part white, and in a strong sea cannot be very well seen; it might be red as there are no red buoys nearer than the Whiting Sand.

VI. None.

VII. Oil.

VIII. None in this neighbourhood.

IX. None.

X. None.

XI. Candles are put on the beacons to enter the harbour if very fine weather and free wind to enter, but it must be very fine as the tide sets across the channel.

XII. The usual fog signals are used off the coast.

XIII. None in the port nor none at the entrance.

XIV. There ought to be a buoy at the entrance under the control of the harbour pilots to remove as the channel shifts.

XV. A small sum yearly is paid to the harbour-master for beacons and repairs thereof.

XVI. None.

XVII. None respecting the dues, but all are of opinion that as the river is such a fine one and so near the sea, a new cut ought to be made at the Quay into Aldbro' Bay.

XVIII. Not the least heavy.

XIX. Yes.

XX. The opinion is that every attention is paid to all buoys and lights off the coast that possibly can be by the Trinity Board.

ADMIRALTY.

Circular V.

ALDBRO'.

Circular VI.

Circular VI.

5. ALDERNEY.

LLOYD'S EVIDENCE.

ALDERNEY.
AMBLE.

Circular VI.

- I. T. N. Barbenson, Island of Alderney, Lloyd's agent, and Trinity House agent.
- II. ISLAND of ALDERNEY, ENGLISH CHANNEL.
- III. The old beacons on the shore marking the positions of the Pierre au Vrac and Boni Rock to the south of the island, are in charge of the Commissioners of Woods and Forests ; also the beacons denoting the entrance to the Old Harbour, or Bray Harbour, the leading lights on the shore marking the fairway into the harbour ; the beacon on Bovée de Braye, and buoy at outer end of deposit for Admiralty Breakwater, in charge of engineers of Admiralty Works.
- IV. Sufficiently well lighted, but not sufficiently buoyed and beacons.
- V. No improvement required in existing lights, buoy, or beacons, but additional buoys and beacons are required.
- VI. First, buoy on Pierre au Vrac Rock, which lies more than two miles from the shore, and for which there is no good cross mark ; second, beacon on Corbet Rock, which is awash at high water, and which is the key to the "Passage du Singe ;" third, beacon on outer or N.W. Jumelle Rock, which is situated in the fairway of the "Passage du Singe ;" fourth, beacon on "Boni Rock," for which there is no cross mark ; and fifth, two beacons on the shore marking the positions of the Brinchetuis Reef, to clear the dangers at the east end of the island. This part of the coast is also very dangerous at night, which could only be obviated by having a light on the shore, which, with the light on the French coast, would designate the Race of Alderney. I have known several vessels lost on that part of the coast during the night.
- VII. Gas is used in the harbour leading lights.
- VIII. Never extinguished since established, except for a few minutes ; no accident has occurred in consequence.
- IX. Buoy at outer end of Admiralty works several times washed away by the sea ; no accidents ever occurred in consequence.
- X. Cannot say.
- XI. None used nor wanted.
- XII. None used.
- XIII. The old shore beacons are coloured *white* and conical ; the beacon on the half tide rock is *red* (description enclosed) ; the buoy at outer end of Admiralty works *black* (description enclosed) ; leading lights *red* (description enclosed).
- XIV. None.
- XV. None.
- XVI. Not aware of any.
- XVII. The general feeling is that more are wanted.
- XVIII. No dues collected.
- XIX. No dues collected.
- XX. Not aware of any.

AMBLE.

6. AMBLE.

Circular III.

LIGHTHOUSE.—(SPECIAL RETURN.)

The Commissioners of Warkworth Harbour have no lighthouse under their authority, and only themselves exhibit a tidal light (gas, at the end of one of their piers,) to show when the harbour can be entered.

Circular V.

BUOYS AND BEACONS.

- I. The Commissioners of Warkworth Harbour, Amble, Aeklington.
- II. The accompanying chart shows the position of the harbour over which the Commissioners have jurisdiction or management over any buoys or beacons, and have therefore no replies to give to any of the following questions.

Circular VI.

LLOYD'S EVIDENCE.

- I. Wm. Muirs, Lloyd's agent, Warkworth.
- II. WARKWORTH and PORT of WARKWORTH.
- III. Coquet Island Light, and buoys in the district, under the Trinity House, London.
- IV. Yes.
- V. None.

AMBLE and BARMOUTH.

AMB

- VI. None.
- VII. Oil for the Coquet Light, and gas for the tidal harbour light.
- VIII. Not heard of any.
- IX. Buoys do sometimes part from the moorings in a heavy sea, but are replaced without delay, but have not known any accidents in consequence.
- X. No well founded complaint ; but when captains make a mistake in fine weather they are glad to blame anything or anybody.
- XI. A tide flag is shown when there is water sufficient on the bar, and a light at night for the same purpose. I am not aware that it can be further improved.
- XII. No fog signals used, nor do I think that they could be used to any advantage.
- XIII. Black, red, black and white, conical black and white nun buoy on Boulmer Head.
- XIV. No.
- XV. None levied.
- XVI. Not aware of any.
- XVII. General satisfaction.
- XVIII. No complaints.
- XIX. I have no knowledge how applied.
- XX. Not aware.

Circular

- I. Thomas Hepplewhite, harbour master, Amble.
- II. WARKWORTH HARBOUR.
- III. The Coquet light and buoys adjacent thereto are under the control of the Trinity House, Deptford Strond.
- IV. I consider the coast adjacent to be well lighted, buoyed, and beacons.
- V. I cannot point out any improvement.
- VI. I cannot recommend any additional lights, buoys, or beacons.
- VII. Oil is used for the Coquet light, and gas is used for the harbour tide light.
- VIII. I am not aware.
- IX. Sometimes the buoys adjacent Coquet Island break adrift, but are replaced with all possible despatch. I do not know of any accident occurring in consequence.
- X. None that I am aware of.
- XI. A tide flag is shown in bad weather near the entrance of the harbour, and a tidal light at night on the south pier end.
- XII. No fog signals are used. I do not think any are required.
- XIII. Black, red, black and white, conical ; a black and white nun buoy on Boulmer Stile.
- XIV. I have nothing to recommend.
- XV. No local dues are levied at this port.
- XVI. None to my knowledge.
- XVII. The Coquet light is marked red, in the stream of Haringley Head to the southward and Boulmer Stile to the northward, and shows a bright light to the east and west of those points. It is the opinion of masters, &c., frequenting this locality, that the red light ought to be continued round to the westward.
- XVIII. None excessive.
- XIX. I cannot say.
- XX. I am not aware.

7. BARMOUTH.

BAR

Circular

Barmouth Harbour, June 24, 1859.

SIR, At the entrance of the harbour there is a bar, from south to north.

A buoy is moored at the outside and another at the inside of bar.

There are four buoys belonging to the harbour, viz., two continually out and the other two on shore, ready to replace those that are out in case of accident or broke loose from their mooring.

No charge is made for the buoys ; there are no charts or maps belong to this port to show or to give you a description of the place.

Sir, I beg to apologise for not answering your queries earlier, not knowing what answer to send ; and now I beg leave to send as above.

I remain, &c.

J. F. Campbell, Esq.
&c. &c.

H. GRIFFITH.

8. BARROW.

LIGHTHOUSE.—(SPECIAL RETURN.)

(No lights in Barrow Harbour.)

BUOYS AND BEACONS.

- I. Barrow Harbour Commissioners.
 II. Chart enclosed. Limits of harbour colored pink; no separate cost kept; no separate charge included in harbour dues.
 III. No.
 V. See sketch.
 a. Iron.
 b. 12l.
 c. 10s.
 d. 5s.
 e. Nineteen.
 f. One.
 g. Barrow.
 h. Five.
 i. Nil.
 k. By Mitchell screw, No. 4.
 l. Dry harbour.
 m. By tender.
 n. Red on right hand, black on left, coming in to harbour. 1 black and white for "Fairway."
 o. Nineteen.
 VI. Pear-shaped for rivers.
 VII. Not longer than six months.
 VIII. Surveyed from time to time by the harbour master.
 IX. No beacon.
 XIV. Harbour dues paid into the harbour office.
 XIX. By harbour master from time to time.
 XXI. Easily discovered by the harbour being dry.
 XXII. Harbour master.
 XXV. Have tried the wood buoys, but found the pear-shaped iron buoys to answer best.

9. BEAUMARIS.

BUOYS AND BEACONS.

- I. Mayor and Town Council of Beaumaris.
 II. These facts can be ascertained on reference to Lieutenant Robinson's charts of the Menai Straits.
 III. No.
 IV. None.
 V. Yes.
 a. Wood.
 b. 18l.
 c. Not ascertainable.
 d. 10s.
 e and f. Seven black nun buoys. One with perch; five red can buoys; one with perch; and one cheque red and white.
 g. Beaumaris.
 h. Four.
 i. Two.
 j. Being run foul of.
 k. Chain and stone.
 l. Above eight pounds.
 m. Not by tender.
 n. Lettered and numbered.
 o. Thirteen.
 VI. None tried any other than those now in use.
 VII. Every twelve months.
 VIII. All surveyed by the harbour masters.
 IX. Not classified.
 X. One.
 a. Causeway Beacon.
 b. Not known. Trinity Board can furnish this information.
 c. To guide vessels from the rocks in entering the harbour.
 d. Being denoted in the charts and colour.
 e. Stones.
 f. Bottom part black; top, white.
 g. No.
 h. About 50 feet.
 i. Not known.
 j. Not known.
 k. Not known.
 XI. None substituted.
 XII. None. Not aware of any banks shifting or increasing.
 XIV. The Town Council.
 XVI. Not ascertainable.

BEAUMARIS.

BEAUMARIS.

Circular V.

- XVII. None made.
 XVIII. None made.
 XIX. By the harbour master in the month of June in each year.
 XXI. Advertisement in the "Shipping Gazette."
 XXII. Yes, the harbour master.
 XXIII. Done by the Trinity pilots.
 XXIV. None.
 a. Chain and stone.
 b. Wood.
 c. See sketch.
 d. Seven feet by three feet six inches.
 e. Black and red.
 h. 2s., 1s., and 6d. per vessel.
 j. Lessee of the Corporation of Beaumaris collects about the harbour.
 k. In entering the harbour, black on larboard, red on starboard.
 m. Replaced as soon as the weather permits.
 XXV. None; but a plan was suggested by Mr. Herbert, of London, some years ago, but never adopted.
 XXVI. None.

LLOYD'S EVIDENCE.

Circular VI.

- I. Hugh Jones, Lloyd's agent, Beaumaris.
 II. BEAUMARIS.
 III. Trinity Board, London, for the Menai Light at the entrance of the harbour. The Mayor and Town Council of Beaumaris for beacon and buoys, also for the light on Beaumaris Pier.
 IV. I do.
 V. I cannot.
 VI. A buoy on the western skirts of the Dutchman bank. The buoy now placed on the said bank is on the north extremity; vessels coming in and going out of the harbour, when going through the east channel, sometimes get aground, their commanders not aware of the bank reaching so far west.
 VII. Oil at the Menai Lighthouse; gas at Beaumaris Pier.
 VIII. No.
 IX. A buoy at times by stress of weather or vessels coming in contact with them gets adrift, but is replaced as soon as possible. I am not aware of any accident having ever occurred in consequence.
 X. Not aware of any.
 XI. Tide signals are not used, and, in my opinion, not wanted, as there is plenty of water at the entrance and inside of the harbour at all times of tide.
 XII. Fog signals are not used. A bell or gong on Puffin Island to be rung or sounded by the telegraph keeper on such occasions would be of great service.
 XIII. Black nun on the larboard hand, red can buoy on the starboard hand coming into port, all lettered and numbered with white paint, arranged in the best possible manner for guiding vessels clear of the banks and follow the channel and moored with a strong chain attached to a stone and placed in about one and a half fathom at low water spring tides.
 XIV. No.
 XV. Halfpenny per ton on all vessels having cargo on board and discharging in the port, payable to the Trinity Corporation for the Menai Light; 2s. per vessel of 40 tons and upwards, and 1s. per vessel under 40 tons to 20 tons, and 6d. per vessel under 20 tons, payable to the Town Council of Beaumaris for percharge; no charge for buoys.
 XVI. An application was made this year by masters of vessels frequenting the port for an additional buoy to be placed on the skirt of the Dutchman bank, and is still under the consideration of the Town Council of Beaumaris.
 XVII. In my opinion the general feeling of the mariners is, that the port is efficiently supplied, except the additional buoy before stated.
 XVIII. Often heard from masters of coasting vessels that Beaumaris is the cheapest port they go to as regards dues.
 XIX. I believe they are.
 XX. No.

I. John Williams, superannuated Trinity pilot for Beaumaris. Circular VI.

II. BEAUMARIS.

III. Trinity for Menai Light, Mayor and Town Council of Beaumaris for Beaumaris buoys,

- BEAUMARIS.**
Circular VI.
 IV. Yes.
 V. None.
 VI. Cannot.
 VII. Oil at Penmon Lighthouse; gas on Beaumaris Pier.
 VIII. Not aware of any.
 IX. Not known.
 X. I am not aware of any.
 XI. No, and in my opinion not wanted.
 XII. Signal on the lighthouse, such as a bell, might be of service.
 XIII. Black buoys on the larboard, red buoys on the starboard, coming up the channel.
 XIV. No.
 XV. Halfpenny per ton for the Menai Light paid to the Trinity Board; 2s., 1s., and 6d. paid to the Town Council of Beaumaris for perch for each vessel.
 XVI. Not aware of any.
 XVII. I believe their feeling is that the harbour is efficiently lighted and buoyed.
 XVIII. Never heard of the dues being excessive.
 XIX. As far as I know they are.
 XX. No.
- Circular VI.**
 I. Richard Lewis, Beaumaris, master mariner.
 II. BEAUMARIS.
 III. Trinity Board for lights; mayor and town council of Beaumaris for buoys and beacons.
 IV. Yes.
 V. Cannot.
 VI. Cannot.
 VII. Oil and gas.
 VIII. Not aware.
 IX. No.
 X. Not aware of any.
 XI. Not used, and, I think, not wanted.
 XII. None used. I think a bell on the outside of the lighthouse would be of service.
 XIII. Black on the larboard, and red on the starboard hand coming into the harbour.
 XIV. None.
 XV. Halfpenny per ton to the Trinity Board for the lights at Penmon. Beaconage payable to the town council of Beaumaris, according to the tonnage of the vessels, 2s., 1s., and 6d. per vessel.
 XVI. Not aware of any.
 XVII. Efficiently lighted and buoyed.
 XVIII. Never heard complaints as to the dues being excessive.
 XIX. To the best of my knowledge they are.
 XX. No.
- BERWICK.**
Circular III.
 10. BERWICK.
 LIGHTHOUSE.—(SPECIAL RETURN.)
 I. Berwick harbour.
 II. The Harbour Commissioners.
 III. The Harbour Commissioners or the Harbour-master.
 IV. One light and a tide light below, which is lighted when there are feet of water on the bar.
 V. 19th September, 1825.
 VI. By Lieutenant Jones, R.N., Commander of His Majesty's Revenue Cutter, "Mermaid."
 VII. It being considered the best.
 VIII. 10th October, 1826.
 IX. Mr. Nelson, engineer; Mr. Redpath, builder; and Mr. Wilkins, London, fit the apparatus.
 X. Harbour light.
 XI. Stone, solid, painted drab, with a red top.
 XII. No conductor.
 XIII. Forty-eight feet.
 XIV. Forty-five feet.
 XV. Seven nautic miles.
 XVI. Twelve and a half nautic miles.
 XVII. About 110° from about east north east round by the east to about south (bearings from the lighthouse).
 XVIII. Fixed, white. Tide light, fixed, red.
 XIX. None.
 XX. From the going away of daylight at night till the return of daylight in the morning. Tide light while there is not less than ten feet on bar.
 XXI. Dioptric-zimuthal condensing apparatus. Tide light, parabolic reflector, with red disc in front.
- BERWICK.**
 XXII. Sixth order apparatus, having one burner, and the tide light has also one burner.
 XXIII. Altered on recommendation of Messrs. D. and T. Stevenson, C.E., from two Argand burners in parabolic reflectors to one Argand burner in dioptric condensing apparatus, to make the light more equable without decreasing its efficiency. New apparatus exhibited 14th July, 1859. No alteration on character or bearings.
 XXIV. Messrs. Sautter and Co., Paris, and Messrs Milne, Edinburgh.
 XXV. By apertures in wall at level of floor, fitted with covers.
 XXVI. There are none.
 XXVII. None.
 XXVIII. None.
 XXIX. Cost of lighthouse, 300*l*. There are no buildings adjoining.
 XXX. Lighthouse was built in 1826.
 XXXI. Lantern of stone, with east-iron sash frame. Light-room 8½ feet diameter, fitted on seaward side, with four panes of glass three feet two inches high and 15 inches broad.
 XXXIII. No account kept.
 XXXIV. No account kept.
 XXXV. One keeper, salary 62*l*. per annum.
 XXXVI. Total cost of condensing apparatus for glass rings and prisms, and fitting up with lamp, complete, about 70*l*.
 XXXVII. No account kept.
 XXXVIII. One hundred gallons of oil; one and a half gross of wicks.
 XXXIX. Sperm, price in 1857, 9s. 4*d*. per gallon; ditto, 1858, 8s. 5*d*. per gallon.
 XL. Circular unbleached cotton, 9s. per annum.
 XLI. None.
 XLII. Out of the general revenue of the harbour, received at the harbour office.
 XLIII. There is no charge for lights.
 XLIV. In 1852, 97*l*. 7s. 7*d*., in 1853, 96*l*. 8s. 6*d*.
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. By the harbour master.
 LI. 12th April, 12th July, 12th October, 12th April.
 LII. The light has never been extinguished.
 LIII. One. Oil kept on the ground floor.
 LIV. None.
 LV. A red light shown below the harbour light when there is a depth of not less than 10 feet on the bar. No signal by day.
 LVI. None.
 LVII. There is only one keeper, who remains in the light-house from dusk to daylight.
 LVIII. They must light the harbour light at the going away of daylight and keep it lighted until the return of day-light. The tide light must be lighted as soon as there is 10 feet of water on the bar and remain so until there is less than 10 feet. The light keeper must report anything particular that comes under his notice.
 (N.B. Since the light was altered, we have used colza oil, the cost of which is 3s. 6*d*. per gallon.)
 On the 29th of July this light on the pierhead was observed from the "Vivid," and used in entering the river. Mr. Stevenson had previously called the attention of the Commissioners to the light. It was first seen, at the point indicated by the chart, first very feebly and then brilliantly. Shortly afterwards, on running a little to the southward, the light appeared to wane considerably, so much so that for a moment it was thought to be a revolving light. The Commissioners landed at about 10 p.m. and having gone for the keeper to the inner end of the pier, returned with him and inspected the light. The apparatus is Dioptric Holophotal, with extra vertical prisms at the sides intended to condense all the available light on the particular passage which it is intended to illuminate, and to mask the light from all other points. The light is produced by a single, Argand burner, oil lamp with one wick, about equal in size to a common French table lamp. The apparatus is evidently very efficient. As compared with shore lights, from the

BERWICK AND BLAKENEY.

steamer the light was exceedingly powerful. It appeared to be the best harbour light then observed, but the window in which it is placed has such thick bars that they neutralize a great deal of the advantage gained by the optical apparatus. Their effect was remarked from the steamer, as above stated, though the cause of the waning of the light was not then suspected. A sharp dark shadow was found to be cast by each of the bars on the ledge outside the window. This would extend to a considerable breadth at a distance. The bar, in fact, *masks* the light from a particular part of the channel. It appeared that an arch should be formed to replace these bars or (that some change should be made to remove this defect in a light which, in other respects, is so good.

There is a red light in the lower part of the tower shown only at particular states of tide. It is an Argand burner in a parabolic reflector, with a red glass cover similar to the harbour lights at Aberdeen. The reflector was in good order; the tower in confusion, being still in the hands of workmen. The keeper's dwelling appeared to be very comfortable, but, in consequence of the length of the pier, it is a considerable distance from the lighthouse. The keeper states that the Fern Island light, distant 16 miles, is hardly ever seen. This light stood 76 on the list of lights visited or seen alight. Later in the evening the red light was observed from the "Vivid," and appeared very luminous.

BUOYS AND BEACONS.

- I. Berwick Harbour Commissioners.
- II. There are no buoys or beacons.

11. BLAKENEY.

LIGHTHOUSE.—(SPECIAL RETURN.)

(No lighthouse at this port.)

BUOYS AND BEACONS.

- I. Thomas Waterson Bacon, clerk to the Blakeney Harbour Company, Clay, Norfolk.
- II. No chart. The best description of the harbour is found in the Admiralty Survey of this place, No. 68. Cost and charges as per accompanying statement.
- III. They are under the sole management of the Directors of the Blakeney Harbour Company and their servants.
- IV. None.
- V. There is no general classification beyond the placing the larger buoy at sea; and as the harbour is entered the buoys decrease in size, with black buoys on the starboard and white on the larboard side.
 - a. Oak and iron.
 - b. Varies as to size, &c.
 - c. Included in the disbursements, general, expended on buoys and beacons, as annexed in account.
 - d. The same.
 - e. Fairway, one red; nine black; and eight white.
 - f, g. Varies; as the number required for the navigation varies, but always a sufficient has been kept at Blakeney Town, where there are now one red fairway buoy, and four each black and white.
 - h. The spare fairway buoy has complete moorings, and five are kept for the others ready at any time.
 - i. About 21 to 22 buoys were shifted and removed, as accident or the alteration of the harbour required.
 - j. Given before.
 - k. Chains and large heavy stone blocks.
 - l. We have no five fathom water.
 - m. Sometimes purchased, but always procured by order direct from one or more of the directors of the harbour.

BLAKENEY.

BLAKENEY.
Circular V.

- n. Any ship going out of this, a dry harbour, in the night or thick weather is accompanied with a boat supplied with the necessary lanterns and assistance to find the buoys.
 - o. All.
- VI. In Blakeney harbourway the buoys are of this pattern (see sketch), and at the turns of the harbour have a staff attached.
- VII. Are constantly attended to; this being the duty of the pilots of the port, who are always paid for any mooring.
- VIII. No other.
- IX. The beacons are general, all within the harbour or that part where ships usually drop anchor; they are long poles from 20 to 30 feet long, and where necessary a solid log buoy is placed.
- X. They vary from 63 to 80.
 - a. They have no Christian names.
 - b. Changing every day.
 - c. To navigate the creeks.
 - d. The eyes.
 - e. Fir poles.
 - f. Natural.
 - g. If wanted, lanterns are on hand and provided free for the ship's use.
 - h. Varies according to situation and requirement.
 - i. Not much; varies.
 - j. Included in disbursements stated.
 - k. No special income from beacons or buoys; ships pay harbour dues 1½d. per register ton.
- XI. What are used are fully sufficient for any want.
- XII. The system adopted is to be ever ready to replace a buoy or beacon.
- XIII. The system adopted is to be ever ready to replace a buoy or beacon.
- XIV. Stated above.
- XV. Stated above.
- XVI. Income from harbour dues:—

For Midsummer quarter, 1852	-	£21	14	10
" " " " 1858	-	21	12	10
Income " for year " 1852	-	89	18	10
" " " " 1858	-	88	4	10
Expenditure for year " 1852	-	45	16	5
" " " " 1858	-	39	6	4

This expenditure is made as complete as the general disbursements of the company allows.
- XVII. None.
- XVIII. None.
- XIX. The harbour master, in whose particular care they are, one and all, placed.
- XX. See buoys.
- XXI. The pilots always know the state of every buoy.
- XXII. There are always at the lower part of the harbour pilots in attendance, and a house has been built for their sole convenience.
- XXIII. The pilots have direct authority to replace every buoy that has drifted.
- XXIV. None.
 - a. Described already.
- XXV. None.
- XXVI. Personal directions.
- XXVII. The Blakeney Harbour Company is a corporate body, authorized by the 57 Geo. III. cap. lxx., by which Act alone the directors are empowered to manage.

Amount received for harbour dues for the Midsummer quarter, 1852	-		-	£21 14 10
Amount received for harbour dues for the Midsummer quarter, 1858	-		-	21 12 10½
Total amount received for harbour dues in the year 1852	-		-	89 18 10
Total amount received for harbour dues in the year 1858	-		-	88 4 10
Total expenditure for the year 1852	-		-	45 16 5
Total expenditure for the year 1858	-		-	39 6 4

BLYTH.

Circular III.

12. BLYTH.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. South-west side of the harbour.
 II. The Blyth Harbour and Dock Company, Blyth, Northumberland.
 III. John Laws, Secretary to the Blyth Harbour and Dock Company.
 IV. Two lights; they bear N. by W. $\frac{3}{4}$ W., and S. by E. $\frac{3}{4}$ E., 148 yards from each other.
 V. Not known.
 VI. Supposed by the late Sir W. W. Ridley, Bart., or his antecedent.
 VII. As a guide to the entrance of the harbour.
 VIII. 1788.
 IX. Not known.
 X. Harbour lights.
 XI. One called the High Light, built of solid ashlar work, whitewashed, castellated top. The other of wood on framework.
 XII. No lightning conductor.
 XIII. Height of house, 40 feet, upon which is a flagstaff 20 feet, and at the top of the latter a vane.
 XIV. Forty-eight feet.
 XV. Eleven miles.
 XVI. 12.8 miles.
 XVII. E. N. E. to S.
 XVIII. Fixed white light.
 XX. For the present when there is nine feet of water in the channel.
 XXII. High light, three gas burners with reflectors; low light, two oil lamps with reflectors.
 XXIII. High light, changed from oil to gas in 1857.
 XXVI. None.
 XXIX. Not known.
 XXXIX. Colza oil, 5s. per gallon.
 XL. Cotton wick.
 XLI. None.
 XLII. Blyth Harbour and Dock Company.
 XLIII. Included in other harbour charges.
 XLV. None.
 L. Private lights.
 LI. No.
 LII. Oil stored on the ground floor; three spare lamps.
 LV. Flag by day and the said light by night, when nine feet or more water in the Channel.
 LVI. Not considered necessary.
 It is supposed that several of the above questions relate to lighthouses of a superior class to those above described.

Circular V.

BUOYS AND BEACONS.

- I. George Harrison, Harbour Master, Blyth, Northumberland.
 II. No buoys.
 X. There are at present in use two beacons, called the Link beacons, a guide for vessels to clear Seaton sea rocks, made of wood with black diamond tops.
 Note.—The outer beacon has been removed, the new breakwater having been extended to the point where it was placed.

Circular VI.

LLOYD'S EVIDENCE.

- I. Richard Hodgson, Crofton Mills, Blyth, miller and shipowner, agent to Lloyd's.
 II. BLYTH and DISTRICT.
 III. Harbour Commissioners, light, tide lights; no beacons or buoys.
 IV. No. There is a new lighthouse being erected by the Harbour Commissioners on the new pier end, but not yet lighted.
 V. An iron beacon is wanted very much on the "Sow and Pig" rocks, which lay a considerable distance from the shore, and vessels very often get on shore.
 VI. (Sec No. 5.) Newbiggin Point, which lays well out, a proper place for an additional lighthouse.
 VII. High light gas, the low light oil.
 VIII. No accident.
 XI. Tide lights lighted 9 feet water, and going out at 9 feet each tide at night, and flag by day.
 XVII. No complaints.
 I. Edmunds and Watts, jun., Blyth, shipowner.
 II. BLYTH.
 III. Blyth Harbour and Dock Company.
 IV. No.
 V. A beacon with a ball is required on Sow and Pig rocks.

BLYTH and BOSTON.

- VI. A beacon with a ball on Sow and Pig rocks. They lay out into the sea, and ships coming from the north are apt to catch them.
 VII. Oil and gas.
 XI. A light by night, and a flag by day, are placed on the top of the lighthouse when there is 8 feet of water on the bar.
 XII. Not used and not necessary.
 XIII. Block-beacons with diamond head, arranged along the half-tide breakwater, west side.
 XV. The local lights being the property of the Blyth Harbour and Dock Company, they charge 2½d. per ton register, which includes the use of the harbour as well as lights.
 XVII. Harbour leading lights not good, otherwise satisfactory.
 XVIII. No complaint.
 XIX. Cannot say.

13. BOSTON.

LIGHTHOUSE.—(SPECIAL RETURN.)

(We have no sea lights of any kind, excepting one used on board the pilot sloop to show where she is moored, and is lighted with Palmer's patent composite candles. There are also some river lights which are lighted with the common dip candles and oil.)

- I. None.
 II. None.
 III. None.
 IV. None.
 V. Cannot say.
 VI. Cannot say.
 VII. Cannot say.
 VIII. Cannot say.
 IX. Cannot say.
 X. A sea light on board the pilot sloop anchored above High Horn Buoy, and along the river.
 XI. None.
 XII. No.
 XIII. Cannot say.
 XIV. Cannot say.
 XV. Cannot say.
 XVI. Cannot say.
 XVII. Cannot say.
 XVIII. Fixed light.
 XIX. None.
 XX. In the winter only, from daylight to daybreak.
 XXI. None.
 XXII. None.
 XXIII. None.
 XXIV. None.
 XXV. None.
 XXVI. None.
 XXVII. Cannot say.
 XXVIII. Cannot say.
 XXIX. Cannot say.
 XXX. Cannot say.
 XXXI. An ordinary lantern lighted with Palmer's patent candles.
 XXXII. Cannot say.
 XXXIII. Cannot say.
 XXXIV. Cannot say.
 XXXV. Seven pilots have a guinea a year each for taking care of sloop and lighting light on board of same.
 XXXVI. Cannot say.
 XXXVII. Cannot say.
 XXXVIII. Amount of consumption cannot say; white seal oil and cotton wicks.
 XXXIX. White seal oil at 4s. 6d. per gallon.
 XL. About 157. per annum.
 XLI. None.
 XLII. From pilotage dues payable to the Pilot Commissioners.
 XLIII. Cannot say.
 XLIV. Cannot say.
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. By no one.
 LI. None.
 LII. Cannot say.
 LIII. Kept on board partly, and in the houses of the "lighters."
 LIV. None.

BOSTON.

- ON.
- III.
LV. None.
LVI. None.
LVII. Every quarter day, as the stations alternate.
LVIII. None.

BUOYS AND BEACONS.

- V. I. The mayor, aldermen, and burgesses of the borough of Boston, in the county of Lincoln, named as Commissioners for carrying into execution certain Acts of Parliament made and passed for improving the port and harbour of Boston, &c., by George York, their clerk.
II. Chart herewith sent. The costs of maintaining the buoys and beacons in 1852 were 407*l.* 7*s.* 1*d.*, and in 1858 were 480*l.* 2*s.* 1*d.*; and the income derived therefrom in 1852 about 1,882*l.* 16*s.* 7*d.*, and the income in 1858 was 1,300*l.* 12*s.* 1*d.* And in the Midsummer quarters, viz.: in 1852, about 436*l.* 1*s.* 9*d.*, and in 1858, about 383*l.* 12*s.* 6*d.* The number of buoys in use and in store about 70, and the beacons (including those used in the river) about 30.
III. Not responsible.
IV. No other authorities are responsible to this.
V. We have two forms only.
a. Wood.
b. From 6*l.* to 3*l.*
c. 5*s.* to 6*s.*
d. 3*s.* to 5*s.*
e. Average about 50.
f. This varies, but always sufficient for any emergency.
g. A storehouse on the wharf.
h. Have generally about 12 in the storehouse.
i. Five.
j. Various; sometimes the chain breaks, sometimes vessels run over them.
k. By proved chain cable manufactured.
m. Tenders, one for the buoy, another for the chain.
n. We have no other means than having black buoys on one side and red on the other.
o. We generally average from 45 to 48.
VI. We consider ours well adapted for their situations.
VII. Our moorings are examined and made secure every year, and the buoys are all removed and fresh tarred and painted.
VIII. A survey by the harbour surveyor once a year.
IX. Two pole beacons, 30 feet above the sands at low water.
a. Gat beacon and Toft beacon.
b. One in 1857, the other last year.
c. For security of life, and to show the top of the high sands at high water.
d. There are no other, and they are changed in the formation.
e. Strong poles, wood tops, and baskets.
f. One red and the other white.
g. Not lighted.
h. Six feet.
i. 60*s.* each.
j. Should say 12*s.* annually.
k. No income.

- XI. Cannot answer.
XII. Cannot answer the question, not being cognizant of anything beyond our own channel.
XIV. Tonnage and lackage dues payable to the Harbour Commissioners.
XV. Same fund.
XVI. Our buoys are maintained by Boston paying two thirds and Spalding contributing one third of the expense.
XVII. Not aware that any applications have been made.
XVIII. None has been made.
XIX. Annual inspection made in August by harbour master, surveyor, and pilots, &c., but the pilots are continually inspecting same.
XX. Beacons surveyed at the same time.
XXI. Captains of vessels, pilots, and fishermen using the channel give immediate notice, so that a buoy adrift is soon replaced.
XXII. Yes.
XXIII. The pilots stationed below are bound to immediately inform the surveyor to the Trust.
XXIV. No complaints.
XXV. Shape a little altered from time to time.
XXVI. Have none.
XXVII. The channel is considered to be as well buoyed and beacons out as any in the United Kingdom.

BOSTON AND BRIDGEWATER.

LLOYD'S EVIDENCE.

- I. James Buckley, Pilot Office, Boston.
II. BOSTON.
III. Boston Harbour Trust.
IV. Sufficiently buoyed and beacons.
VI. Two leading lights might be advantageously placed on the Long Sand to enable ships to enter Boston Deep in the night, and a hooded light on Like's House to let shipmasters know when they are the length of the slidway.
VII. Sperm candles.
VIII. Not any.
IX. In gales of wind, and from vessels fouling the buoys, they are sometimes broke adrift, but they are replaced as soon as possible, and no accident has occurred to my knowledge.
X. None.
XI. Not any.
XII. Not any.
XIII. Red and black; the black on the starboard side coming in, and the red on the larboard side.
XIV. No.
XV. None whatever.
XVI. Not any to my knowledge.
XVII. That no port in England is better buoyed and beacons, or better lighted as far as the harbour lights are concerned.
XIX. Yes, particularly so.
XX. No.

- I Richard Booth, Wainfleet, near Boston, farmer, agent for Lloyd's.
II. BOSTON.
III. The Corporation of Boston.
IV. I have reason to think so. This is an arm of the sea running up to Boston, and the channel is marked by buoys, one side of which has red buoys and the other black.
V. There are no lights or beacons on this coast.
VI. Two additional small buoys are required at the entrance of Wainfleet Haven.
IX. A buoy has occasionally been displaced from the effects of a storm, but has not been long without a fresh one.
XI. There is a tide buoy in Clay Hole distinguished by a bell, this has been removed.
XIII. Red and black of the usual form.
XV. Wainfleet harbour being subject to the port of Boston lackage 1*d.* a quarter for corn is charged, and 3*d.* per tonnage on vessels.
XVIII. Never heard any complaint.
XIX. I have no reason to think otherwise.
I may observe that the above applies to the southern part of my district. There are no lights, buoys, or beacons to the northward, which extends to Donna Nook, and is under the control of the Trinity House, Hull.

Circular VI.

14. BRIDGEWATER.

BRIDGEWATER.

LLOYD'S EVIDENCE.

- I. Thomas Sully, agent to Lloyd's, Bridgewater.
II. BRIDGEWATER.
III. Lights under control of Trinity House; buoys and beacons under the control of the Port and Navigation Committee of the town council.
IV. Yes.
VII. Oil.
IX. When displaced, are immediately put in order by harbour-master.
XIII. One white, others black, and one chequered, taper form.
XV. One penny per ton harbour dues; one shilling per vessel for mooring; three shillings per vessel for Bumpkin light.
XVII. That they are sufficient.
XVIII. The only complaint is that 3*s.* for the Burnham light is excessive.
XIX. Yes.
XX. No.

Circular VI.

BRIDPORT.
BRIXHAM.

15. BRIDPORT.

BUOYS AND BEACONS.

(None of these questions are applicable to Bridport Harbour.)

LLOYD'S EVIDENCE.

- I. Daniel Good, ropemaker and timber merchant.
 II. THE HARBOUR, Bridport, County Dorset.
 III. Board of Commissioners.
 IV. I do.
 V. Cannot suggest any.
 VI. Do not see the advantage of any.
 VII. Tallow.
 VIII. Not aware of any.
 IX. Do not know of any.
 X. Not aware of any.
 XI. The signals are lanterns, one on each extreme point of the pier.
 XII. None used, and do not consider they are required.
 XIII. One buoy, coloured black, form of a large piece of timber rounded the sides and ends, and always moored.
 XIV. Do not see the service of any change.
 XV. None levied.
 XVI. Not aware of any.
 XVII. The general feeling in my opinion is satisfactory.
 XVIII. Dover and Ramsgate dues are mostly complained of at present.
 XIX. Yes, so far as I am informed.
 XX. Not aware of any.

Circular VI.

- I. John Swain, Harbour Master.
 II. BRIDPORT, County Dorset.
 III. Commissioners.
 IV. Quite so.
 V. None.
 VI. None wanted.
 VII. Tallow candles.
 VIII. Not to my knowledge.
 IX. Not any.
 X. Have not heard of any.
 XI. Tide signals are used, two lanterns to guide between the piers.
 XII. None used nor wanted.
 XIII. One black buoy for warping out as in the harbour constantly moored.
 XIV. None.
 XV. None.
 XVI. Heard of none.
 XVII. Heard of no complaint.
 XVIII. Have heard of no complaint of late years of light dues. Dover and Ramsgate dues frequently.
 XIX. Cannot answer that question.
 XX. I am not.

16. BRIXHAM.

LIGHTHOUSE.—(SPECIAL RETURNS.)

- I. Brixham.
 II. The Commissioners for improving the Harbour and Market of Brixham.
 III. None.
 IV. There is no lighthouse of any description. There being merely a common gaslight at the pierhead, with red glass seaward.

BUOYS AND BEACONS.

- I. The Commissioners for improving the Harbour and Market, Brixham, by R. W. Wolston, their clerk.
 II. There is none.
 III. None.
 IV. None.
 V. Two buoys to denote the limits of the harbour, both cylindrical or drum-shaped.
 a. Timber, iron bound.
 b. Under 10f.
 c. No specific account kept, being so trifling.
 d. Ditto.
 e. Two.
 f. None.
 g. None.
 h. None.
 k. By anchor and chain.

Circular V.

BRIXHAM and CARMARTHEN.

- l. Under 10f.
 m. By tender.
 n. None.
 o. None.

BRIXHAM
Circular

- VI. No experience, the buoys being scarcely within the influence of the tide.
 VII. Not any.
 VIII. None.
 IX, X. There are no beacons.
 XI. No substitution has taken place.
 XII. No dangers exist.
 XIII. Wide answer to Query IX.
 XIV. The general harbour funds
 XV., XVI. There are no beacons.
 XVII., XVIII. There has been no application made.
 XIX. No special inspection; they are usually overhauled once a year by the harbour master, and paid with coal tar.
 XX. There are no beacons.
 XXI. No public notice is given, as the two buoys are stationary, merely to mark extent of harbour.
 XXII. The contingency has not happened.
 XXIV. None have been made.
 XXV. None.
 XXVI. None.
 XXVII. This harbour lies within Torbay, on the southern side, the access to which in all winds, and at all times of tide, coupled with its freedom from all rocks, shoals, sand banks, and all other impediments so usual to harbours in general, point it out as a fit locality for a harbour of refuge, to which it is hoped the attention of Government will be directed, protected as it is by the batteries on Berry Head, and having all the necessary materials on the spot for constructing more.

17. CARMARTHEN.

LLOYD'S EVIDENCE.

- I. Robert Dunkin, agent for Lloyd's for the Llanelly district and a Harbour Commissioner.
 II. RIVER TOWEY to the CARMARTHEN BAR, and LLANELLY HARBOUR.
 III. Thomas Richards, Quay, Carmarthen, Local Inspector of Buoys, under the Trinity House.
 IV. Not sufficiently buoyed.
 V. A bell buoy should be substituted for No. 1, at Carmarthen Bar.
 VI. A buoy should be placed between No. 1 and No. 2, for in thick weather it is difficult to distinguish the one from the other, the distance being so great. I would also recommend that, instead of being numbered, which is difficult to make out in thick weather, each buoy should be distinguished by being painted a different colour.
 VII. Oil is used in the two lighthouses, within the harbour of Llanelly.
 VIII. I am not.
 IX. The harbour buoys are occasionally shifted as the channels alter.
 X. See observations at the end.
 XI. The harbour light is exhibited during night tides from half flood to half ebb. The Whitford light is exhibited from half flood and half ebb, from sunset to sunrise.
 XII. None used.
 XIII. Black, with the exception of No. 3, which is chequered, and is placed about the middle of the channel.
 XIV. Each buoy should have a different colour.
 XV. One penny per ton register is charged on all vessels passing over this bar of Burry.
 XVI. I do not know of any.
 XVII. I believe mariners frequenting the port are satisfied as to the efficiency of the present lights, beacons, and buoys, except the suggested alterations.
 XVIII. All I believe are satisfied.
 XIX. I believe they are so applied.
 XX. I am not.

OBSERVATIONS.

Within the last few years, in my capacity as agent for Lloyd's, I have had occasion to attend several wrecks in the vicinity of Carmarthen Bar, viz. :—
 The Hanoverian galliot "Gute Hoffnung," with a cargo of statutory, valued 40,000l., one person drowned.

CARMARTHEN and CARNARVON.

- The "Huskisson," of Liverpool, with palm oil, valued at 15,000.
 - The American ship "Pickering Dodge," in ballast, six persons drowned.
 - The American ship "Queen of the West," cargo valued at 40,000.
 - The barque "Sir Henry Pottinger," now on the sands, cargo valued at 60,000, one person drowned.
- It is my decided opinion that if there were a bell buoy instead of the present No. 1 on Carmarthen Bar, in all probability some if not all these vessels would have escaped shipwreck.

- I. W. S. Brown, late of Ferry Side.
- II. RIVER TOWEY, CARMARTHEN.
- III. Mr. Thomas Richards, Quay, Carmarthen Local Buoy Inspector.
- IV. Not sufficiently buoyed.
- V. No. 1, on Carmarthen Bar buoy, far too small to be quickly seen in rough weather; a bell would be of great value in thick weather.
- VI. A buoy between No. 1 and 2, if practicable, as in rough or hazy weather, it is very difficult to make out No. 2 from No. 1; if a buoy cannot be laid down, a beacon on No. 2 would be desirable. No. 3 chequered to be black. It was chequered very many years since for craft to anchor at low water, but the pool has been filled many years. A red buoy should be placed in the best anchorage at low water, with the depth painted on it.
- XIII. Black, with the exception of No. 3, which is chequered, conical. About the centre of the channel.
- XIV. No. 3, chequered to be black. It was chequered many years ago for vessels to anchor at low water; the pool has been filled years since. A red buoy may be placed in the best anchorage at low water with the depth painted on it.

18. CARNARVON.

The limits of the port of Carnarvon extend—
 "From the mouth of the river Maltraith, in Anglesey, along the east side of the said river northward to the middle of Carnarvon bay, southerly seaward, and from thence to the river called Afon-hen, in Carnarvonshire eastward, from thence to the south side of the Swelley rocks, in the river Menay northward, and all the said river southwardly."

	£	s.	d.
Cost of maintaining buoys in 1852	125	10	1
Ditto ditto 1858	150	12	2
Income derived therefrom in 1852	110	0	0
Ditto Midsummer quarter 1852	27	10	0
Ditto ditto 1858	21	5	0
Total number of buoys	-	-	14
Ditto beacons	-	-	1

- LLANDDWYN, LIGHTHOUSE.—(SPECIAL RETURN.)
- I. Llanddwyn lighthouse on Llanddwyn Point.
- II. Trinity House.
- III. Trustees of Carnarvon harbour.
- IV. One light.
- V. October 5, 1842.
- VI. Trustees of Carnarvon harbour.
- VII. The prominence of the position of Llanddwyn point, and its proximity to Carnarvon bar.
- VIII. January 1, 1846.
- IX. Built by order of the trustees of Carnarvon harbour, under the directions of their surveyor.
- X. Harbour light.
- XI. Stone, solid, cemented outside and painted white.
- XII. No lightning conductor.
- XIII. The light-room is attached to the base of a round tower 35 feet high.
- XIV. Fifty feet.
- XV. Nine miles.
- XVI. Five miles.
- XVII. Ninety degrees from N.W. by N. to S.W. by W.
- XVIII. Fixed red.
- XIX. None.
- XX. From dark until daylight.
- XXI. Catoptric.

CARNARVON.

- XXII. Six Argand lamps with parabolic reflectors.
 - XXIII. No alteration.
 - XXIV. De Ville and Co., 367, Strand, London.
 - XXV. A funnel through the roof.
 - XXVI. None.
 - XXVII. None.
 - XXVIII. None.
 - XXIX. 250*l.* 7*s.* 5*d.*, the cost of adaptation of a tower previously built.
 - XXX. Finished.
 - XXXI. Window consists of six squares of plate glass 2 feet 2 inches by 2 feet; cost included in amount stated above XXIX.
 - XXXII. Not purchased.
 - XXXIII. Average annual cost, *li.* 11*s.* 5*d.*, not by contract.
 - XXXIV. Average annual cost of painting 2*l.* 1*s.* 4*d.*, not contract; coated every second year with oil paint.
 - XXXV. Four pilots act as keepers, who have a subsidy of 4*l.* per annum in the aggregate.
 - XXXVI. 63*l.* 10*s.*
 - XXXVII. 5*l.* 9*s.* 4*d.*
- | | | Galls. | Qrts. | | No. |
|--------------|--------|--------|-------|--------|-------|
| XXXVIII. Oil | - 1857 | - 174 | 2 | - Wick | - 270 |
| Do. | - 1858 | - 180 | 2 | - do. | - 240 |
- XXXIX. Colza oil, price in 1857, 4*s.* 8*d.* per gallon.
 - Ditto 1858, 4*s.* 6*d.* ditto.
 - XL. Cotton wick, cost, 1857, 9*s.* 6*d.*
 - Ditto ditto 1858, 8*s.* 4*d.*
 - XLI. None.
 - XLII. From the harbour trust fund.
 - XLIII. No dues charged for the light.
 - XLIV. Expenditure in 1852, 91*l.* 3*s.* 2*d.*
 - Ditto 1858, 89*l.* 4*s.* 7*d.*
 - XLV. None.
 - XLVI. None.
 - XLVII. None.
 - XLVIII. None.
 - XLIX. None.
 - L. By the surveyor to the trustees.
- | | 1857. | 1858. |
|--------------|-------|--------------|
| LI. May 29. | | January 12. |
| June 24. | | February 11. |
| September 5. | | April 17. |
| October 16. | | October 22. |
| November 12. | | December 9. |
| December 16. | | |

- LII. No.
- LIII. One spare lamp and burner; oil kept in a room on the second floor of the tower.
- LIV. None.
- LV. Not used.
- LVI. Maryat's code of signals, a gun, blue lights, and skyrockets.
- LVII. Every three hours.
- LVIII. Similar to those adopted by the Trinity House.

BUOYS AND BEACONS.

- I. Trustees of Carnarvon harbour, acting under the Acts 33 Geo. 3. c. 123, and 49 Geo. 3. c. 24.
- II. See chart and marginal statement.
- III. Not responsible.
- IV. Not responsible.
- V.

	1st Class.	2d Class.	3d Class.
	Wood.	Wood.	Wood.
b. £60 0 0	£30 0 0	£25 0 0	0 15 0
c. 3 0 0	1 10 0	0 15 0	0 15 0
d. 2 0 0	1 0 0	0 15 0	0 15 0
e. One.	Three.	Ten.	
f. Two.	Five.	Five.	
- g. In the harbour sheds at Carnarvon.
- h. One of each class.
- i. One.
- j. Breaking of moorings.
- k. Some moored with anchors, others with stones.
- l. About 10*l.* 10*s.*
- m. Chains procured by tender; buoys not by tender.
- n. A buoy is identified in the daytime by its colour and form; no means of identification by night, or in thick fog.
- VI. The trustees would be glad to receive information on this point.
- VII. Never beyond six months.
- VIII. They are examined in position when practicable, and thoroughly examined when brought in, and repaired if necessary.
- IX. There is only one beacon on the channel edge of a stationary bank at the entrance of the straits.

CARNARVON.

CARNARVON and CARDIFF.

Circular V. X.

- a. Perch beacon.
- b. Not known.
- c. To indicate a stationary bank.
- d. Its colour and form.
- e. Timber.
- f. Black.
- g. Not lighted.
- h. Seventeen feet.
- i. Not known.
- j. 1852, 13s. 1858, 5l. 12s. 6d.
- k. None.

- XI. No alteration.
- XII. In coming in, black buoys are to be left on the port hand; red buoys on the starboard hand; chequered buoys close to on either hand; green nun buoys are placed to the seaward of sunken rocks.
- XIII. Perch beacon, being black, is to be left on the port hand.
- XIV. From the harbour fund payable to the trustees at the harbour offices.
- XV. Same.
- XVI. Refer to marginal statement to chart.
- XVII. None.
- XVIII. None.
- XIX. Inspected monthly by the surveyor to the trust.
- XX. The same.
- XXI. Generally by advertisement in the "Shipping Gazette."
- XXII. The pilots stationed at Llanddwyn have strict instructions to give immediate intimation of a buoy having broken adrift.
- XXIII. No superior authority.
- XXIV. None.
- XXV. None.
- XXVI. None.
- XXVII. None.

Circular VI.

LLOYD'S EVIDENCE.

- I. Smith W. Davids, Church street, Carnarvon, Lloyd's Agent.
- II. The PORT of CARNARVON.
- III. The trustees of Carnarvon harbour.
- IV. I do.
- V. I cannot see that any alteration is necessary, or would be beneficial.
- VII. Oil.
- VIII. I am not aware of any casualty of this kind having occurred.
- IX. Some of the buoys have been occasionally displaced by storms but they have always been replaced as soon as practicable, and no accident has occurred.
- X. I know of none.
- XI. No tide signals are used or needed.
- XII. None are used, nor do I think any are required.
- XIII. Black, red, chequered, and green can buoys in the Channels, and nun buoys on sunken rocks and jets of baulks. In coming into harbour black buoys are left on the port hand, red buoys on the starboard hand, green buoys are placed to leeward of sunken rocks.
- XIV. I do not think any alteration would be of service.
- XV. No charge for lights. Vessels passing through the straits are charged for use of buoys, 1s. per ton, per register loaded—and one halfpenny per ton per register when in ballast or empty.
- XVI. I know of none.
- XVII. I believe all parties are well satisfied with existing arrangements.
- XVIII. I have heard no complaint.
- XIX. I know that they are.
- XX. I do not know of any.

19 and 20. CARDIFF.

Sir,

Cardiff, June 6, 1859.

THE Corporation of Cardiff have no control over the lights, buoys, and beacons in the Bristol Channel and the Roads here, with the following exception, viz., that they keep in repair two or three buoys at the mouth of the Taff. The rest are under the supervision of the Corporation of Bristol; this remark also applies to the lighthouse on the Flat Holmes. The trustees of the Marquis of Bute, the owners of the Bute Docks, have laid down numerous buoys to mark the channel or cut which leads up to their docks.

Under these circumstances I was under the impression

CARDIFF.

that I could not give the Commissioners any information which would be of service to them; but, if the contrary should be the case, I shall be most happy to fill up the form to the best of my ability.

Awaiting your reply,

I am, &c.

J. F. Campbell, Esq.
&c. &c.BEN. MATTHEWS,
Town Clerk of Cardiff.

BUTE LIGHTHOUSE.—(SPECIAL RETURN.)

- I. The Trustees of the Marquis of Bute, Bute Docks, Cardiff.
- (No lighthouse at or connected with the Bute Docks, Cardiff.)

BUOYS AND BEACONS.

- I. The Trustees of the Marquis of Bute, Bute Docks, Cardiff.
- II. The accompanying plan shows the situation of all the buoys under the management of this authority. The cost of maintaining the buoys cannot be given. No income derived from the buoys.
- III. Not responsible to any superior authority.
- IV. None.
- V. Neither classified or designated, but used only to show the line of the channel or cut from the River Taff in the Bristol Channel to the docks and tidal harbour.
- VI. Made of wood.
- VI. Not known.
- VII. No period fixed, done when required.
- VIII. No uniform system exists.
- IX., X. No beacons under this authority.
- XI. Solid timber buoys are now being substituted for band buoys as the latter are worn out.
- XII. The principle is merely buoying out the channel or cut to the docks.
- XIII. No beacons.
- XIV. From the general receipts of the docks.
- XV. No beacons.
- XVI. No income from buoys. The expenditure cannot be given.
- XVII., XVIII. No applications made.
- XIX. Inspected by the dockmaster as may be necessary.
- XX. No beacons.
- XXI. None. When a buoy gets adrift it is seen, and replaced the following tide.
- XXII. Yes; the dockmaster.
- XXIII. Not under any superior authority.
- XXIV. No complaints or representations have been made or received.
- XXV. It is found that square solid timber buoys are better for the purpose required than band buoys.
- XXVI. None issued.
- XXVII. None.

LLOYD'S EVIDENCE.

- I. John Owen, Cardiff, Lloyd's agent.
- II. CARDIFF.
- III. Trinity Board, and some buoys in the river by the corporation of Cardiff.
- IV. Yes, with the exception of Breaksea Point.
- V. None.
- VI. I would suggest the great desirability of a lighthouse being placed on Breaksea Point, or a ball buoy moored in four fathoms water off the Point.
- VIII. No.
- IX. The buoys have not unfrequently been displaced, but they are well attended to by the agent of the Trinity Board here.
- X. Since May 1843 at least 25 vessels have been stranded on Breaksea Point, and not more than six have been got off; had a light or a bell buoy been there all probably would have been safe.
- XI. There are gas tide lights at the pier heads of the Doche, and they appear to be sufficiently good for the purpose.
- XII. I am not aware of any fog signals being used in this locality except on board floating lightships.
- XIII. The positions and colour of the buoys are correctly laid down in the charts of the British Channel.
- XIV. None.
- XV. By the corporation of Cardiff a charge of 2s. 6d. for each vessel under 60 tons register, and 5s. for each vessel above, is levied for buoys and harbour dues.
- XVI. None.

CARDIFF and CARLISLE.

- VII. They seem quite satisfied except as regards Breaksea Point.
 XVIII. I hear no complaints.
 XIX. Partly so, and remainder in affording police and other protection to the shipping.
 XX. All seem perfectly satisfied.

21. CARLISLE.

SOLWAY FRITH LIGHTHOUSE.—(SPECIAL RETURN.)

- I. English Channel, Solway Frith.
 II. Trinity House, London.
 III. Port Carlisle, Dock and Railway Company.
 IV. Five lights, viz., lightship, Lee Scar lighthouse; Cote lighthouse, Lading Channel lights to Silloth Bay, tide lights at Annan, and tide light at Port Carlisle.
 V. 1837.
 VI. Carlisle Canal Company.
 VII. As recommended by Lieut.-Col. G. Robinson, R.N., to Admiralty.
 VIII. May 1841.
 IX. John Boyd, Companies' Engineer.
 X. Channel lights.
 XI. Timber, painted white.
 XIII. Lee Scar 64 feet, Cote 42.
 XIV. Lee Scar 25 feet, Cote 52.
 XVI. Lee Scar 12 miles, Cote 10 miles; lightship 8 miles.
 XVII. Lee Scar from E. by N. $\frac{1}{2}$, round northerly to S.W. $\frac{1}{2}$ S., Cote from N.E. to S.W.
 XVIII. Fixed in white or red, as per chart.
 XX. Sunset to sunrise.
 XXI. Catoptric.
 XXII. Four in lightships three in Lee Scar, four in Cote, two in Annan, and one in Port Carlisle.
 XXIII. December 1857. Extra burner in Cote light ship.
 XXIV. Messenger and Sons, Birmingham.
 XXV. Air pipes.
 XXVI. Tolls a bell.
 XXX. Finished.
 XXXII. Built by company.
 XXXV. Four men in lightship, 226*l.* per year; 1 man in Lee Scar, 47*l.* per year; 1 man in Cote, 31*l.* per year; 1 man in Annan, 31*l.* per year.
 XXXVII. 10*l.* per year.
 XXXIX. Colza oil, 4*s.* 6*d.* per gallon.
 XL. Cotton wicks, 2*s.* 6*d.* per gross.
 XLII. 1½*d.* per ton on vessels in and out; harbour office.
 XLV. None.
 XLVII. None.
 L. W. Geddes, Superintendent for Company.
 LI. No.
 LIII. Spare set at St. Kinburness.
 LVI. Private flags by day.
 LVII. Lightship men once a month.
 LVIII. One man constantly in attendance at the various lights.

BUOYS AND BEACONS.

- I. Port Carlisle Dock and Railway Company, late Carlisle Canal Company.
 II. Chart obtained, J. D. Potter, 31, Poultry, and 11, King Street, Tower Hill, London.
 III. Trinity House, London.
 IV. None.
 V. Red can buoys on starboard and black nun buoys on the Portland up to Silloth, thence to Port Carlisle; black can buoys in deep.
 a. Wood or iron.
 b. From 6*l.* to 24*l.*
 c. See average.
 d. See average.
 e. Fourteen buoys.
 f. Three buoys.
 g. Buoy and light establishment, Skinburness.
 h. Three buoys and moorings complete.
 i. Eight accidentally, and six shifted in accordance with change in channel.
 j. Broke adrift or sunk by vessels.
 k. Chain and stone.

CARLISLE.

- l. 5*l.* 10*s.*
 m. By tender; new, and repaired by Daylock.
 n. Paint, number or perch.
 o. The whole.
 VI. Iron new buoys.
 VII. Overhauled, and painted twice a year.
 VIII. The superintendent goes over the whole once a fortnight.
 IX. One at Silloth anchorage, being a mast with cross and ball, and one on Cardunock Scar mast and black cross.
 XI. When required, iron instead of wood.
 XII. See answer to No. V.
 XIII. None.
 XIV. 1½*d.* per ton on vessels in and out harbour offices.
 XV. None.
 XVI. Average annual income for last five years, 359*l.* average annual outlay for last five years, 785*l.*
 XVII. No applications or suggestions, except by the superintendent, and carried into effect.
 XVIII. None.
 XIX. W. Geddes, Superintendent for the Company.
 XX. None.
 XXI. Notice to pilots, harbour offices, and advertisements in newspapers and harbour bills.
 XXII. Yes, the superintendent.
 XXIII. Report to Trinity.
 XXIV. None.
 XXV. Superintendent to survey Channel buoys and lights, and report to this Company once a fortnight.

LLOYD'S EVIDENCE.

Circular VI.

- I. John Nicholson and Co., merchants, shipowners, and shipbuilders, N. B.
 II. The SOLWAY FRITH, from the Solway floating light ship to Annan.
 III. The Carlisle and Silloth Dock and Railway Company.
 IV. No.
 V. The buoys are correctly enough placed, as far as they go, but are too small and too far apart.
 VI. One large red buoy on the north-west side of Silloth Bank, a large black buoy on the south side of Maria Bank, a large chequer perch-buoy in the Fairway, and a lightship moored a little to the west of No. 5 buoy. There being at present only one buoy at the entrance of this, the direct channel to Annan, is the reason of the foregoing application.
 VII. Oil.
 VIII. Not aware of the lights having been extinguished, nor duly exhibited.
 IX. The buoys have been replaced at once after being displaced.
 X. The schooner "Mary," of Carlisle, in attempting to take the channel, proposed to be buoyed and lighted as above, went on shore on Silloth Bank and became a wreck, in consequence of being unable to make the buoy at the entrance, it being run down from its small size, in Aug. 1859. The schooner "St. Winifred," of Liverpool was lost turning up at night, in May 1857.
 XI. None used and none required.
 XII. Bells are rung at Annan Waterfoot, Silloth, and floating light, but from their small size are not heard at any great distance.
 XIII. Red, black, and chequered. Red, can buoys; black, nun buoys; chequered, nun buoy with a perch. Red on starboard side from sea; black on port; chequer in fairway.
 XIV. No.
 XV. Yes; 3*d.* per ton to the Carlisle and Silloth Railway Company.
 XVI. No formal complaint ever made to our knowledge.
 XVII. The general feeling of mariners is, that the buoys are insufficient in number, and too small.
 XVIII. That the charge is too high for the accommodation.
 XIX. We have no means of knowing.
 XX. In consequence of the opening of the Silloth Dock, the steamer and foreign trade vessels with cargoes for Carlisle, which previously came to Carlisle, end their voyages at Silloth. The opinion is that the Silloth Dock and Railway Company will not now have the same interest in keeping the upper part of the Frith so efficiently buoyed as formerly.
 P.S.—Several of the scours in the upper part of the Frith should have perches placed on them to show their position.

CARLISLE.
Circular III.

CARLISLE and DARTMOUTH.
Lights and Buoys, Solway Frith.

Railway and Steam Navigation Office,
Carlisle, Jan. 5, 1860.

Circular V.

SIR,

I BEG to return you one of the Royal Commission Inquiry Papers, with queries answered by Messrs. John Nicholson and Co., Annan, and those answers confirmed by thirteen masters of vessels frequenting the Solway Frith, in all the essential portions of their answers. I also concur, and have always been of opinion that vessels going into Maryport should contribute towards the maintenance of the buoys and lights to the eastward in the Solway Frith, as in stormy weather vessels bound for that port frequently, in certain states of the wind and tide, run up into Silloth Bay for safety, and that without contributing to the funds. The Solway lightship is moreover of good stead in assisting vessels to make the port of Maryport in dark weather; and I am further of opinion the management would be much better under the Trinity Board altogether.

Your obedient servant.

Capt. Halstead, R.N.,
Lloyd's, London.

E. JOBLING,
Lloyd's Agent.

WE, the undersigned captains of vessels belonging to and trading from the port of Annan, having read the answers to the questions in the paper accompanying this, hereby express our entire concurrence in them:—

John Rodrick, brig "James Reddin."
Francis Maxwell, brig "Helen Douglas."
James Hastie, flat "Black Diamond."
Thomas Bell, schooner "Susan."
John Faulden, schooner "Circassian."
John Richardson, "Prosperity," of Annan.
John Irving, A. & W. trader.
Joseph Johnstone, schooner "Suffolk Hero."
Robert Lomas, schooner "Syren," of Annan.
John Irving, schooner "Corby Castle."
Hugh Davidson, schooner "Dryad."
George Irving, "John and Mary."
Matthew Irving, "Fidelity," Annan.

22. COCKERMOUTH.*

23. DARTMOUTH.

(See also page 43.)

LLOYD'S EVIDENCE.

- I. Thomas P. Tipper, harbour master.
- II. DARTMOUTH.
- III. Town Council of Dartmouth. The Trinity Board placed the buoys many years ago, since which time they have declined having any further charge of them.
- IV. I do not.
- V. I consider that the Nimble rock should be buoyed, and there could be an improvement in the light, and the Pin rock should be blown up at a trifling expense.
- VI. The Nimble rock is about one mile to the eastward of the Eastern Black Stone, and a very dangerous rock. I would recommend a beacon on the eastern side of the harbour, which the Trinity Brethren has had some time under consideration.
- VII. Oil, but I consider gas would give a better light, and could be conducted to the lighthouse at a reasonable expense.
- VIII. The lighthouse has been erected three years; was first lighted on the 1st of January, 1857. During the time it has been lighted it has been the means of saving many ships.
- IX. The buoys have been displaced many times. The Pin buoy and the Checkstone do. are both adrift at the present, and have been for the last two months. There is not any convenience in the port for overhauling the buoys, which ought to be done once a year.
- X. The Nimble revenue cutter was lost on the Nimble rock, and several other ships have struck on the same rock within the last four years, two of them large ships, which went to Plymouth for repairs.
- XIII. Checkstone buoy, chequered; Castle Ledge buoy, black; Homestone buoy, black and white rings; Pin buoy, red.
- XV. One farthing per ton, register tonnage, received by me, and 6d. out of each ship goes to the corporation, which is deducted off the farthing per ton. The harbour duties are not compulsory.

DARTMOUTH.

DARTMO

- XVI. I have heard many masters find fault that there is not a beacon erected, and the light is not so good as it ought to be.
- XVII. The opinion is as I have stated, that there could be an improvement in the light, and the Nimble rock buoyed and beacon placed.
- XVIII. I find that many object to pay, and others think it a very reasonable charge. Brixham ships in general object to the charge. My opinion is, that if any excessive charge was made that ships would rather stop at sea.
- XIX. Yes.
- XX. The light could not be managed better than it is, as the funds would not admit of it. The buoys are very often adrift for want of proper convenience to replace them.

I. Richard Langworthy Hingston, Dartmouth, Lloyd's Circular agent.

II. DARTMOUTH.

- III. The Town Council, Dartmouth, but not responsible.
- IV. The port is fairly buoyed, if kept in order. I should think a beacon on the other side of the river at the centre of the harbour desirable.
- VI. A beacon on the high ground or hills beyond King-swear Castle would be desirable, as the harbour is a blind one, and not so well known as its excellence merits.
- VII. Oil.
- VIII. Since a lighthouse was built at the expense of the town, the light has been carefully kept up, with a competent person in charge. Before this I am not aware of any accident having occurred, through light not being exhibited.
- IX. After a heavy gale buoys break adrift, but soon replaced.
- X. None.
- XI. None used or required.
- XII. None used or required.
- XIII. Checkstone buoy, chequered; Castle Ledge buoy, black; Homestone buoy, black and white rings; Pin buoy, red.
- XIV. No.
- XV. One farthing per register ton received and collected by the harbour master to maintain the light, out of which 6d. per ship is paid to the Town Council, the remainder is optional, and no means of enforcing payment.
- XVI. No complaints, but a beacon would be very desirable.
- XVII. An improvement could be made on the light.
- XVIII. There is a difference in opinion on this subject.
- XIX. Yes.
- XX. Could not be better managed according to the funds.

I. John Bulley, Dartmouth, late master mariner, E.I.S. Circular

II. DARTMOUTH.

- III. The light and buoys are supported by the town.
- IV. I consider the coast adjacent well lighted and buoyed. I consider a beacon on the eastern entrance to the harbour would tend very materially to identify the harbour, coming from the south-west more particularly.
- VI. I would strongly recommend this beacon to be erected on the top of the inner froward, for the following reasons: the land being higher than the outer froward, and equally open from the east, south-east, south, and south-west. And also being nearer the entrance to the harbour, ships steering for it would be sure to be enabled to fetch the harbour, or the roads, whichever way the wind was, and would also steer clear of all danger. If it were placed on the outer froward, ships steering from the south-west for it would find themselves too far to the southward when they opened the harbour, with a strong N.N.W. wind, to fetch into the roads. The harbour light oil is used.
- VIII. Not to my knowledge.
- IX. The buoy that was placed on the Pin rock was washed away in the gale on the 25th of October last.
- X. I know of none.
- XI. Dartmouth harbour is accessible at all times of tide, therefore no signals are necessary.
- XIV. None.
- XV. One farthing per ton is levied on vessels entering the port, for supporting the light, collected by the harbour master.
- XVII. The light and buoys are never complained of, but I believe most mariners would think a beacon desirable.

DARTMOUTH and DERRY.

- OUTH.
 XVIII. We have at times some difficulty in collecting the farthing per ton for supporting the light, having no power by law to enforce the payment.
 XIX. They are.

24. DERBY—MORECAMBE.

MORECAMBE LIGHTHOUSE.—(SPECIAL RETURN.)
No. 1.

- I. Morecambe harbour, screw pile lights on Clark's Wharf, Morecambe Bay.
 II. The Midland Railway Company, Derby, as lessees of the railway and works.
 III. Wm. Briggs, harbour master, Morecambe, near Lancaster.
 IV. One light only.
 V. The North-western Railway Act, 1846.
 VI. The North-western Railway Company.
 VII. To mark the entrance to the channel leading to the new harbour of Morecambe.
 VIII. October, 1854.
 IX. Alex. Mitchell and Son, Belfast, by contract.
 X. Sea light.
 XI. Timber with screw pile. House red.
 XII. None.
 XIII. Seventy-eight feet from sand.
 XIV. Thirty-eight feet.
 XV. Seven nautic miles.
 XVI. Twelve miles.
 XVII. See Chart and Sailing Directions.
 XVIII. Fixed red light.
 XX. From sunset to sunrise.
 XXI. Dioptric.
 XXII. Second order. One burner.
 XXIII. No alterations.
 XXIV. M. Sautie and Co., Paris.
 XXV. Ordinary pipe.
 XXVI. A bell rung by machinery.
 XXVII. Four days only according to lightkeeper's log; but they state it is always used when necessary.
 XXVIII. Twenty days of fogs and thick mist.
 XXIX. 2,594, inclusive of 5 screw-pile beacons.
 XXX. Finished.
 XXXI. Included in contract for lighthouse; cannot furnish particulars.
 XXXIII. The total cost of repairs from October 1854 to October 1858 is 153*l.*, of which amount 68*l.* is for contract work in 1857.
 XXXIV. Painted twice annually; cost about 7*l.* 10*s.*
 XXXV. Three at 2*s.* a week, and boatman 10*s.* each trip.
 XXXVI. Included in contract for lighthouse.
 XXXVII. Cost in 1857, 11*l.* 16*s.* 6*d.*; 1858, 9*l.* 19*s.* 5*d.*
 XXXVIII. About 130 gallons in 1857, in 1858 about 120 gallons. No account of wick used.
 XXXIX. Patent railway lamp oil at 4*s.* 6*d.* to 4*s.* 9*d.* per gallon.
 XL. No account kept.
 XLI. 60*l.*, including fixing.
 XLII. From dues on shipping entering Morecambe harbour
 XLIII. Not opened till October 1854.
 XLIV. Income for quarter ending 30th June 1855, 129*l.* 7*s.* 3*d.*; 1858, 92*l.* 11*s.* 8*d.* Income for 1855, 477*l.* 2*s.* Expenses for 1855, 456*l.* 3*s.* 1*d.*; 1858, 334*l.* 13*s.* 5*d.*
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. By the harbour-master and engineer of the company.
 LI. At intervals.
 LII. Never accidentally.
 LIII. One spare lamp, 3 burners in a part of the house on the light set apart.
 LIV. A barometer.
 LV. A round ball by day and a green light by night indicate 8 feet in the channel up to the harbour.
 LVI. A flag hoisted on the flagstaff by day, no night signal or code of signals, if assistance is required from the shore.
 LVII. Weekly, two on and one off.
 LVIII. Copy of regulations herewith.

This light was seen burning by Dr. Gladstone, on the night of September the 6th, from Fleetwood, and the screw pile erected was observed next morning from the beach. The light stands 141 on the list.

DERBY.

MORECAMBE LIGHTHOUSE.—(SPECIAL RETURN.)
No. 2.

- I. Morecambe Harbour, near Lancaster.
 II. The Midland Railway Company, Derby, as lessees of the railway and works.
 III. William Briggs, Harbour Master.
 IV. One fixed light on Morecambe Harbour Pier.
 V. North-western Railway Act, 1846.
 VI. The North-western Railway Company.
 VII. For harbour purposes.
 VIII. 14th October 1854.
 IX. Contractors, Robert Wilson, Builder, Lancaster; Engineer, R. Smallman, Esq.
 X. Harbour light.
 XI. Brown sandstone, built solid, shape round pillar.
 XII. Copper wire.
 XIII. Thirty-three feet.
 XIV. Forty feet.
 XV. Seven miles.
 XVI. Twelve miles.
 XVII. The light is masked to show brightest to the S.W., the fairway for the channel to the harbour.
 XVIII. A fixed white light.
 XX. From sunset to sunrise.
 XXI. Reflecting.
 XXII. One burner.
 XXIII. None.
 XXIV. Smith, Edinburgh.
 XXV. A pipe.
 XXVI. A bell.
 XXVII. Rung about 12 times.
 XXVIII. No log kept.
 XXIX. 858*l.*
 XXX. Finished.
 XXXI. 75*l.* Height of lantern 8 feet, diameter 5 feet 9 inches.
 XXXIII. None. See annual cost of Painting or Coloring.
 XXXIV. None.
 XXXV. One, at 18*s.* per week.
 XXXVI. 25*l.*
 XXXVII. 5*l.*
 XXXVIII. Oil, 46 gallons per annum; wicks, 104 per annum. Gas is now used.
 XXXIX. Patent railway oil at 4*s.* 6*d.* to 4*s.* 9*d.* per gallon.
 XL. Fine plated cotton wick.
 XLI. To 3*l.* 10*s.*
 XLII, XLIII, XLIV. See Return for Screw Pile Light.
 XLV, XLVI, XLVII, XLVIII, XLIX, L., LI. None.
 LII. No.
 LIII. One oil lamp is kept, should any accident happen to the gas.
 LIV. None.
 LV. A black ball hoisted at the pier denotes 8 feet of water up to the harbour.
 LVI. None.
 LVII. None required.
 LVIII. The only regulation is, that the light be exhibited from sunset to sunrise.

MORECAMBE HARBOUR.

RULES for the LIGHTKEEPERS of the SCREW PILE
LIGHTHOUSE ON CLARKE'S WHARF.

1st. That they are the servants of the North-western Railway Company, and are subject to the same rules and regulations as other servants of the said Company.

2nd. They shall sign a declaration that they accept the situation, subject to the risks of remaining on the lighthouse, or of being taken in boats to and from it, and with a full knowledge of its structure, and of all other risks incident to the situation.

3rd. That of the three lightkeepers two shall always remain on the lighthouse, and the third shall be on shore a week.

4th. The men on duty shall keep watch six hours each. The man who has the afternoon watch shall, before sunset, see that the lamps and reflectors are in proper order, and at sunset light the same; during the night watches each must take care that the lamp is constantly burning properly and clearly.

5th. The man who has the morning watch shall extinguish the light at sunrise, clean the reflectors, trim the lamps, and clean out the living room properly.

6th. They must jointly clean out all closets, cupboards, and storerooms, and keep everything else clean and in proper order and condition.

7th. The machinery of the fog signal must be kept wound up, and in foggy weather or snow the bell must be

DERBY.

DERBY.

constantly ringing, and in such cases, if needed, both keepers must be on duty.

8th. It shall be deemed a fog when the No. 1 black buoy cannot be seen between sunset and sunrise.

9th. That the green light be lit at night, and the ball be hoisted in the day at such times as the keepers shall consider there is 8 feet water up to the pier.

10th. That a logbook be kept, in which shall be entered he times of relief, state of the weather, and any other matters.

11th. That great care be at all times taken to prevent accident by fire.

12th. In case any accident has happened, or anything is required specially, a union jack must be hoisted, when a boat will be sent.

13th. The lightkeeper off duty shall, at least once a day go to the pier and see if any signal is flying, and shall also get ready all coals and water and stores, and also go to the house of the man remaining on duty, and take down his provisions or clothes.

14th. That the man whose duty is ended, be relieved every Wednesday, when possible at the last quater's ebb, or dead low water, so that the relieving boat may be in as little danger as possible from contact with the piles; the time of relief to be fixed by the captain of the tug or the boatmen.

15th. That the bell be struck three times when any of the company's steamboats are passing, as a signal that all is right.

16th. That all reports be made to the harbour master, and all orders be received from him.

17th. That all requisitions for stores be made a month before being required, so as ensure a proper supply.

18th. The lifeboat attached to the house must not be used for pleasure or for fishing, but only in cases of necessity.

XVII. None.

XVIII. None.

XIX. By the harbour master and workmen of the Company.

XX. Same.

XXI. By advertisement and circulars.

XXII. Harbour master and Company's engineer.

XXIII. By letter, by post, or by train.

XXIV. None.

XXV. The buoys originally laid down floated on their quarters, all of which (except one) have been replaced by others floating on end. Buoys on the latter principle are now being made of iron for this place.

XXVI., XXVII. None.

25. DOVER.

Dov

Circular

LIGHTHOUSE.—(SPECIAL RETURN.

I. Dover Harbour.

II. The Honourable Warden and Assistants, Council House, Dover.

III. John Iron, Harbour-master, Dover.

IV. Five lights, for a description of which see the printed handbill annexed.

X. Harbour.

XI. The two wooden staffs on which the two large red lights named in the printed bill are hoisted rise from a circular timber building painted white. The small low red lights also named in such bill, one of them being however always used with large red lights, are shown from iron columns, painted lead colour, as is also the green light referred to in the said bill.

XIII. The staffs are respectively 60 feet and 50 feet in height, the columns for the low red light each about 6 feet, and the column for the green light 12 feet.

XIV. Large red lights, respectively 75 feet and 65 feet; the low red lights 21 feet, and the green light 18 feet.

XVI. The large red lights from 12 to 14 miles, the low red lights 10 miles, and the green light 4 miles.

XVIII. Fixed, the colours being before given.

XX. During such periods of tide as are specified in printed bill.

XXII. Two Argand gas burners to each large red light, one only of oil to small red lights, and one batwing burner (gas) to green light.

XXVI. Bell on south pier.

XXVII. No register kept.

XXVIII. The like.

XXXV. One, the deputy harbour master, whose salary is 100*l.* per annum, for which he performs other duties.

XLII. The revenues of the harbour.

XLVIII., XLIX. None.

LV. See printed handbill.

NOTICE TO MARINERS.

Alteration of Tidal Signals at Dover Harbour.

Notice is hereby given, that on and after the first day of January 1852, the following tidal signals will be exhibited at Dover Harbour instead of those now in use:—

Depth of Water on Ebb and Flow by Index at North Pier.	Day Signals.	Night Signals.
7 to 10 feet.	Red flag with a black ball under at the customary staff on the south pier.	A small low red light on the north pier, and a similar light on the outer extremity of the south pier.
10 to 13 feet.	Red flag on the same staff.	The lights now in use, viz. two large red lights on the signal staffs of the south pier, and the above mentioned small low red light on the north pier.
13 feet & upwards	Red flag with a black ball over on the like staff.	Lights as above.

BUOYS AND BEACONS.

I. The Midland Railway Company, Derby, as lessees of the railway and works.

II. The accompanying charts will show the jurisdiction, and the printed sailing directions will give the positions of the buoys and beacons. No special account is kept of the expenses of, or income derived from the buoys and beacons. The total income and expenditure for the periods named is given in the Lighthouse Return, No. 1.

III. No.

IV. None.

V. The printed sailing directions attached designates the buoys in the Channel.

a. Wood.

b. 7*l.* to 20*l.*

c. 3*s.*

d. 10*s.* per annum.

e. The buoys in the Channel are, one large outer buoy, black, one red perch buoy, (see sketch) three ordinary 12 feet channel buoys, red, two black buoys, and four mooring buoys in the harbour.

f, g, h. There are none in reserve at present, but some iron buoys are being built.

i. Four.

j. Two are supposed to have been run down by vessels, and two have broken adrift in storms.

k. Large stone and chain.

l. Chain 12*l.* stone and bolt 17*s.* 6*d.*, and fixing 2*s.*

m. Repairs are done by the Company's servants.

n. By size, by perch, and by mode of flotation.

o. Three.

VI. The floating perpendicular buoy for both.

VII. Twelve months.

VIII. None.

IX., X. Five beacons were originally put down, but four of them were soon destroyed by bad weather, or by vessels coming in contact with them, and were not replaced, buoys being substituted in preference.

XI. The floating perpendicular buoy is now the one in general use.

XII. The buoys define the margin of the channel; red buoys being on the starboard, black on the port hand.

XIII. One beacon on starboard hand.

XIV., XV., XVI. See answers to XLII., XLIII., XLIV., Lighthouse Special Return, No. 1. The amounts there given include receipts and expenses on light-houses, buoys, and beacons.

Circular V.

DOVER.

A brilliant green light projecting its rays towards the harbour's mouth will be exhibited throughout the night, by the clock tower in the inner part of the harbour, and will show midway between the piers.

No signal to ships in general will be made between seven feet at ebb and seven feet at flood, by the index board, and whenever, at other times, the harbour is inaccessible to vessels, the flag (if in the day) will be pulled down, and (if at night) the light or lights on the south pier will be extinguished, and only upon the former being rehoisted, or the latter relighted, can the harbour be entered.

By order of the Honourable Warden and Assistants of Dover Harbour,

G. T. THOMPSON,
Registrar.

Dover, 11th September, 1851.

June 5.—Admiral Hamilton, Captain Ryder, and the Secretary inspected the lights at Dover.

The light at the end of the new Mole is a blue light, a gas burner in a lamp with a blue shade. The effect of this light was remarked previously, see Personal Observations, vol. I. On this occasion it was explained that the late storm had injured the gas pipe, and that the light was shown from a small lantern placed for the time.

This light is only intended to keep vessels off the new works, and is under the charge of the Government.

The red harbour light is produced by two lamps, which are hoisted on separate masts. The flame is gas, and is kept constantly burning, so that it is only necessary to turn up the gas in the morning. There are two silvered reflectors, and the lantern is surrounded with red glass. The reflectors were encrusted with dirt. The glass of the lantern covered with soot, which adhered to the fingers when the glass was touched in the inside. The glass was also covered with condensed moisture, even with the gas burning low. It was evident that the lantern and reflectors had not been cleaned for a long time. On endeavouring to use one of the reflectors as a burning speculum in the sun, it was found impossible to get even a tolerable focus, a small silvered glass speculum of three inches would have produced more effect. The place where the lanterns are lowered during the day was locked, the key lost, and it was found necessary to break into it with a hammer.

The green light is produced in a common street lamp glazed with green glass, and placed at such a height that the sails of a boat passing in front of it obscured the light. The back of the lamp is occupied by an opaque screen, with a reflector, which the harbour master stated to be made of glass, and subsequently of glass covered with a peculiar composition. On examining it somewhat closer it turned out to be tin painted white, and considerably smoked.

It was suggested by one of the Commissioners that this material would not be so liable to injury as the silver, and the harbour master stated that such was the case.

It was subsequently stated that the gas company have charge of this lamp, and that they had removed the glass reflector to send it to London to try if one like it could be got. It appeared to the Commissioners that the harbour lights at Dover required superintendence.

Steamed round the back of the Goodwin, and observed the large buoys there placed. There was a strong tide running, a considerable sea on, and a strong breeze, and the buoys rode upright and steadily.

They were conspicuous at a great distance, and presented a remarkable contrast to the buoys in the Solent.

They are coloured black, red, and black and white, in stripes, each has some distinctive peculiarity of form, such as a square, or triangle, or ball on the apex of the cone. A wreck buoy, smaller, painted green, and of the form called nun, was observed. It was almost under water, and as an example of the old system was a remarkable contrast to the new buoys, of which the Commissioners expressed their high approval.

The Chairman boarded the Goodwin or North Sand Head lightvessel with some difficulty, owing to the tide and the sea. She was in good order.

LLOYD'S EVIDENCE.

I. James A. Crundall, Dover, master mariner.

II. DOVER.

III. Mr. J. Iron, harbour master, Dover.

IV. No.

V. I consider the lights on the piers are not lofty enough to be seen to the westward, over the Admiralty Pier, and that they have not sufficient power to be seen any distance. I would suggest that the buoys off the Admiralty Pier had beacons on them, as they are run under by the tide, and are dangerous to shipping coming close round the pier.

II.

DOVER and FAVERSHAM.

DOVER.

Circular VI.

VI. I would recommend a floating light to be placed near the Varne or Ridge, as it was only last week an outward bound ship was lost there, the crew and passengers, numbering nearly 60, being all lost. The light on the end of the Admiralty Pier is green, and very inferior.

VII. Oil and gas are used for the harbour lights at this port.

VIII. I do not recollect any instance of the lights not being duly exhibited or of any accident happening in consequence.

IX. The buoys in the harbour have several times broken adrift in consequence of the moorings not being sufficiently strong, and ships damaged thereby.

X. I consider that the ship happened to be lost last week on the Varne or Ridge might have been saved had there been a light there.

XI. The tide signals used at this port are a red flag with ball under from seven to ten feet, ten to thirteen red flag above, and from thirteen upward red flag with ball uppermost.

XII. I do not know of any fog signals in use by the harbour. I think a gong would be very useful at tide time in foggy weather.

XIII. The buoys in this port are square, and are coloured black with coal tar.

XIV. I would recommend them to be in the form of a pear as at present they go under water directly a strain comes on them.

XV. I am not aware of any.

XVI. I have known of complaints being made about the buoys, but cannot state the time.

XVII. About the same as my own.

XVIII. I cannot say I am not aware of any charge being made expressly for lights or buoys. I presume it is included in the harbour dues, which are generally unsatisfactory.

XIX. I do not know.

XX. I am not.

I. Latham & Co., merchants and ship agents, and agents to Lloyd's, Dover.

Circular VI.

II. The PORT of DOVER and COAST adjacent.

III. The Commissioners of Dover Harbour for the lights and buoys of the port.

IV. Yes.

VII. Oil and gas in Dover Harbour, electric light and oil at the South Foreland, and oil at Dungeness.

VIII. We are not aware of any such occurrence.

IX. We are not aware of any such occurrence.

X. We know of none.

XI. Two red lights on the south pier and one red light on the north pier, when there is 8 feet water and above in the harbour, and a red flag in the daytime is hoisted on the south pier to denote the same.

XII. Guns and fog bell.

XIII. Square buoys painted black; but only for mooring buoys, no other buoys required.

XIV. We have no change to recommend.

XV. None.

XVI. No complaint to our knowledge with reference to lights, buoys, or beacons, have been made.

XVII. We believe the general opinion to be that the lights, buoys, and beacons are very good and efficient for the purposes required.

XVIII. We have no local dues in respect of lights, buoys, or beacons.

XIX. None collected.

XX. We are not aware that any other than an opinion of satisfaction prevails.

28th December 1859.

26. FAVERSHAM.

FAVERSHAM.

BUOYS AND BEACONS.

Circular V.

I. W. A. Chambers, Bridge House, Preston, Faversham, Superintendent of the Faversham Navigation, and Water Bailiff.

Q q

FAVERSHAM.

FAVERSHAM.

- Circular V.
- II. The Faversham navigation is a creek about two miles inland of the East Swale; requires no buoys; we have a few stick beacons only. The charges for anchorage and beacons are, 1s. for a barge, 2s. for small ships, and 3s. for large ships. The income is about 20*l.* a year. The stick beacons and collecting are paid from the amount; the remainder at the disposal of the Lord of the Manor.
- III. To the Lord of the Manor and the Commissioners of the Faversham Navigation.
- IV. James Lightfoot, Dredger, of Faversham. Is a water bailiff. His duty is to prevent ships and boats anchoring on the oyster beds.
- V. There is one buoy at the entrance of the creek, and one at the sand end of the horse, which the Trinity attend to.
- Wood.
 - Do not know.
 - Do not know.
 - Do not know.
 - Two.
 - One for each.
 - On board the Trinity vessel.
 - Do not know.
 - None.
 - When there is displacement it is when ships or barges make fast to them; it seldom happens.
 - With chain and stone sinker.
 - Do not know.
 - Do not know.
 - One painted letter spit buoy, the other sand end buoy.
 - Two.
- VI. Nun boys.
- VII. Ours are often inspected by the Trinity, and when required to be repaired are taken away and put down.
- VIII. When any damage occurs to them I report it to the Collector of the Faversham Customs, and he to the Trinity.
- IX. There are no beacons only those belonging to the oyster company, which are show beacons, about 30 feet long, five inches in the middle.
- X. About 20.
- No specific name.
 - For centuries.
 - To divide the oyster beds.
 - Not required.
 - Norway spars, 5 inches middle.
 - Black.
 - Not lighted.
 - Four to six feet
 - About 2*l.*
 - 1852, 6*l.* 10s. 1858, 3*l.* 10s.
 - No income.
- XI. We have no change.
- XII. If any are destroyed they are replaced immediately.
- XIII. We have no places but what are attended to.
- XIV. The Company of Dredgers.
- XV. The stick beacons are paid for out of the water bailiff dues at my office.
- XVI. No income; the expenditure is by the oyster company.
- XVII. None.
- XVIII. None.
- XIX. By the Trinity; have no dates.
- XX. The foreman of the oyster company.
- XXI. I inform the Collector of Customs, he writes to the Trinity.
- XXII. No, there is not; but I always receive early information.
- XXIII. As described in XXI.
- XXIV. None.
- Answered in XVI.

The East Swale is held by the oyster company under the Right Hon. Lord Sonds, and has been for centuries. The present foreman of the company is Mr. W. Clark. If you require any other information about the Swale he will give it you; or any other information about the Faversham Navigation, Mr. Jassel, Solicitor, Faversham, who is clerk to the Commissioners, will give it you.

27. FLEETWOOD.

These lights were visited on the 24th of August by Dr. Gladstone;—the upper light in the evening, and both in the morning. They stand 139-140 on the list of lights visited or seen afloat. They are tide lights, and lead into the harbour. They are lighted at half tide, which is notified by twisting a ball high, well built of stone, which is kept of the natural colour, the lantern being painted red. The lower light is in a building on the beach, 40 feet high, of stone, unpainted; built in 1840. Both houses appeared neat and clean. They are kept by two men, who remain with their respective lights when they are burning. Gas is burned in each, and each is provided with a large parabolic reflector. The gas is the same with which the town is lighted. It was burning well and brightly at the time of the evening visit, but it is said sometimes to "wink," and once the light in the lower lighthouse went out. This was on the occasion of the Queen's visit, and happened just as she was entering the harbour; the cause probably being that many additional burners were just then lighted at the large hotel close by, which diverted all the gas for a short time. The chimnies rarely break. The reflector in the upper lighthouse is remarkably well kept; that in the lower is scratched, and shows signs of rough handling. Accounts are kept of the times of lighting and extinguishing gas, and of the state of the weather. Small cannons are fired during fogs in answer to vessels signalling distress.

There are three small beacons; black poles with four stays marking channels.

There are also eight buoys—nun, black—inspected regularly. Duplicates are kept on shore.

Besides these a large beacon belonging to the Trinity House was looked at from a distance.

28. FOWEY.

LLOYD'S EVIDENCE.

- I. Wm. Lowry, Lloyd's agent, Fowey.
- II. FOWEY.
- III. The corporation of Lostwithiel receive dues on all vessels that enter this harbour, but will do nothing else.
- IV. No.
- V. There are no lights within this port.
- VI. I would suggest a light being erected at the entrance of Fowey Harbour, first, because it is not distinguishable by vessels coming from the eastward; secondly, there is no harbour but Fowey, between Falmouth and Plymouth, where vessels can run for refuge; and, thirdly, vessels bound to Falmouth for orders, in thick weather, frequently overshoot that port, and for want of a light pass Fowey Harbour, and thereby incur further danger.
- X. Within the last three years three vessels have been stranded on Par Sands (about four miles westward of this harbour), the masters believing at the time they were running into Falmouth Harbour, taking the Gribbin Head for St. Anthony's Point. In strong gales from south-south-west to south-south-east, and vessels embayed between Falmouth and Plymouth, there is no harbour for refuge but Fowey. In the year 1838 two vessels were wrecked near Looe, and in 1850 one near Polperro, which no doubt would have been saved had there been a light for this harbour.
- XI. None used or wanted.
- XII. None used; do not think them necessary for the port.
- XIII. None.
- XV. There is 1s. 4*d.* per vessel charged by the corporation of Lostwithiel for anchorage.

FOWEY, GOOLE, and GUERNSEY.

lar VI. XVII. My opinion is, that the general feeling of mariners are that a light is required for Fowey Harbour, for the reason that, during the dark winter months even vessels belonging to the port wait outside, the masters not being able to distinguish the entrance, thereby incurring great danger.

lar IV. I. Lieut. Wm. F. Essell, R. N., Fowey.
II. FOWEY.

III. The corporation of Lostwithiel.

VI. I conceive a light placed on a spot abreast of White House would be highly advantageous as a leading mark into the harbour by night, to be so placed as, when visible from seaward, will lead a ship clear of the Carnes Rock into the harbour; at the same time, I think it an indispensable condition that the corporation of Lostwithiel, who have the control of the harbour, should appoint an harbour-master, sufficiently authorized to regulate the proper berthing of vessels, so as to leave a clear fair way in, and that vessels be not allowed, as now is the practice, to anchor and moor anywhere, without reference to other ships that may arrive.

29. GOOLE.

LLOYD'S EVIDENCE.

lar VI. I. Thomas Woodhead, South Sheet, Goole, Master Mariner.
II. From HULL to GOOLE.

III. The Worshipful the Wardens, Elder Brethren of the Trinity House, Kingston-upon-Hull.

IV. No.

V. As there is neither buoy, beacon, or light between the port of Hull and Goole, (one wreck buoy excepted,) any of the aforesaid would be an improvement.

VI. First, one light at Chaldersness for a guide into South Channel; second, one light upon Wiltonness to shade three different colours, as a guide round the Ness, and up Wilton Channel; two leading lights at Wilton, as a guide from north to south shore, and vice versa, one of the lights to be easily shifted, as the channel might shift a little lower down or higher up; and one light on Flaxtleness. The whole of the above lights would only require to be of a small description to be seen, say, three or four miles off.

X. Accidents have been numerous of a minor sort, but the want of lights prevents the river from being navigated at night time, which is a great drawback to the port of Goole, with its increasing steam trade.

XV. A vessel of 188 tons register pays 10s. 6d. per voyage to the Trinity House and Corporation of Kingston-upon-Hull.

XVIII. The general feeling of mariners belonging to the Port of Goole is, that the dues are excessive, considering there are no lights between Hull and Goole.

30. GUERNSEY.

LIGHTHOUSE.—(SPECIAL RETURN.)

(There are no lighthouses attached to the island of Guernsey.)

NOTES BY CAPT. RYDER.

Wednesday, 5th October.—Left Southampton for Guernsey in "Courier," Captain Goodrich.

He thinks all the buoys in the Solent too small. Not fog bells enough. Prefers a gun fired at moderate intervals, say from 5 to 12 minutes; interval varying with the site, as a means of identification.

GUERNSEY.

GUERNSEY.

Observations by Commissioners.

Captain Goodrich gave the following evidence.

Floating light off Southampton Water should be moved further out towards the Spit.

New Needles light is a very useful light. A great improvement on the old high light; but has too many changes of colour; they are confusing. All light-houses ought to be coloured red, or some dark colour. The *Sherries* off the Start ought to be better marked.

There are no lights at Channel Islands; they are very much required. Has suggested to the Estates a buoy, with a fog bell, to be placed at the north entrance of the Little Russel Channel.

Never saw any notice of the new lightship on the Shambles until after he saw her. Heard from a captain, that he nearly run her down. Never received the new directions to avoid collisions. Thinks a more systematic way of distributing navigation notices would be very valuable.

The notices at the Custom House are seldom read or remembered.

In making Guernsey from the northward, Herm Island, being not unlike the north part of Guernsey, in thick weather care must be exercised lest the latter is mistaken for the former, which would be fatal.

Several buoys are required.

One at Plat Boue, north of Herm.

One bell buoy north-east of Plat Fources, north of Guernsey.

One buoy on the Agenor Shoal, north point of Guernsey Roads.

One buoy on Les Têtes d'Aval, south of Herm.

One buoy or beacon, on Les Grunes de Serbourg, south of Guernsey.

Brehon beacon is now a fort.

The Great Bank ought to be buoyed for large vessels.

The new lighthouse building at Les Harois should show red towards north shoals.

If South Martin Points and Brehon Fort were lighted, there would be a safe leading mark for the anchorage from the northward.

Blanchard Rock, east of Jersey, ought to be buoyed.

La Pierre au Vach, south-west of Alderney, ought to be buoyed.

A gun at Casquets would be very useful. There is a fog bell there; but I have frequently passed close to the island in thick fogs, and never heard the bell.

Blanchard Rock, east of Alderney, ought to be buoyed.

At the Harbour Office.

Mr. Saumarez Carey, deputy, showed the model of a bell buoy constructed by Captain Goodrich.

Peter Corbett, Pilot.—Cannot hear the fog bell at Casquette more than one mile. The lights are good. The harbour light of Guernsey is well placed, and is to be made more powerful.

A light on Brehon Fort and the South Martin Point would be very useful.

Abraham Dumaille, and Stephen Dumaille, the "Charlotte," cutter, Southampton; Peter Jordan, of the "Cesar," coasting trader:—

Bell at Casquets insufficient. A good fog signal there would be very useful. No French pilots know these dangers well. Sereq very dangerous; but cannot suggest any remedy.

Jersey.—A light at La Corbière would be very useful. Red to the northward.

The beacon on La Sellette should be enlarged.

Grandfour, Pignaut, and Diamond Rocks, should be marked.

A beacon should be placed on Honguet.

The harbour light purposes only to light west passage; so eastern passage is unlighted.

St Catherine light is useful, north of Jersey.

GUERNSEY.
Circular III.
Observations
by Commis-
sioners.

GUERNSEY.

Mr. A. Tupper, Magistrate.—Guernsey, as regards dues, is considered by the Home Government as "over-sea." The Trinity Board suggested to the Estates that they should be placed on the footing of the coasting trade; but when they, the Trinity Board, found out that by so doing 2,400*l.* less dues would be paid, they withdrew the suggestion.

The receipts of dues of various kinds amount to about 8,000*l.* a year. Some portion of this is mortgaged to pay interest of their debt, which is increasing, as they improve the harbour.

Mr. Jones, agent of Weymouth line, has not heard any complaints from his captains; but is aware that many improvements might be made; thinks the Small Russell Channel might be better buoyed.

I visited the *Pier Light*. It is placed on the top of a tower on the pier end. The tower was apparently built in 1774 as a sea mark, and was lighted in 1831. The lantern is constructed of wood and glass; the wooden uprights being so broad and clumsy as to eclipse about one-sixth of the horizon.

The gas for the lamp and for six pier lights, and the cleaning of the lamps, &c. is contracted for by the gas company for 100*l.* a year.

An old man, named Newberry, a gasman, lights and extinguishes the lamps. His pay for this and other duties at the gasworks is 1*l.* a week. Nobody remains at the light at night, but he would be sent for if anything was wrong. The glass appeared dirty and cracked, and the ladders and every part of the house was dirty and neglected, the roof black and charred. Newberry is only paid for lighting and cleaning glass. The harbour master considered the gas was frequently not turned on full.

There are six burners, placed at a considerable distance from one another.

Sometimes water gets into pipe, and then gas is extinguished for perhaps half an hour.

A. P. RYDER.

Royal Commission,
Lights, Buoys, and Beacons,
7, Millbank Street, S.W., London.

SIR,
21st December, 1859.
WITH reference to the enclosed forms, I am directed to request, that in reply to No. 15 of the General Light-house Return, a precise statement may be given of income and expenditure.

I am, &c.

J. F. CAMPBELL.

[This letter was accompanied by the forms which were sent to the other local authorities, asking information relative to local lights.]

Pier Office, Guernsey,
3rd January, 1860.

SIR,
I HAVE the honour to return herewith enclosed the form or return on lighthouses, &c. filled up relative to this island, and I beg to say that there are no lighthouses attached to Guernsey.

I am, &c.

NICHOLAS LE MESSURIEU,
Harbour Master.

J. F. Campbell, Esq., Secretary,
&c. &c.

[The lighthouse forms were not filled up, but another form was sent, from which it appeared that there is a lighthouse under the management of the local authority, and that it is defective.]

Royal Commission,
Lights, Buoys, and Beacons,
7, Millbank Street, S.W., London.

SIR,
6th January, 1860.
I AM directed to call your attention to the statement in a return signed by you, in which reference is made to a light on the South Pierheads ("defective"), and to request your attention to the foot note in the enclosed forms, which I am to request you to fill up.

I am, &c.

J. F. CAMPBELL,
Secretary.

GUERNSEY.

Pier Office, Guernsey.

SIR,
19th January, 1860.
IN answer to your letter of the 7th instant, enclosing certain forms, I have to observe that the word "defective" used by me in reference to the light on the South Pierhead, had reference not to the light itself, which is of gas, but to the lantern, the frame of which is of wood, and of such size as to somewhat intercept the light, which thus is defective. The lantern would probably have been altered previously to this had it not been in contemplation in the execution of the harbour works now in progress, to erect a new tower and lantern. Consequently the authorities have retained the old lantern for the present to avoid unnecessary expense, and further, I beg to repeat that there are no lighthouses attached to Guernsey.

I have, &c.

NICHOLAS LE MESSURIEU,
Harbour Master.

J. F. Campbell, Esq.,
Secretary.

From this return of correspondence it appears that the lighthouse at the pier at Guernsey is not a lighthouse attached to Guernsey, and thus numerous wrecks occur on the island.

BUOYS AND BEACONS.

- I. Sausmarcz Carey, Esq., Supervisor of Harbours and Treasurer of the States for 1859.
- II. No official chart in existence, but the supervisor provides buoys and beacons where thought necessary. No income is derived therefrom, and the expense of the same is defrayed out of the general harbour revenue.
- III. The Royal Court and the states of Guernsey.
- IV. The harbour master of St. Peter's Port and the harbour master of St. Sampson act under the supervisor, and are responsible to him.
- V. The buoys are not classified. There are only two guiding buoys, which are placed in the small Russell, both conical. The other buoys are mooring buoys.

a. Wood.

b. The Russell buoys each cost about 4*l.*

c. *Sl.* each.

d. Painting included in the *Sl.* above stated.

e. Two.

f. Three.

g. All kept in the States' store at St. Sampson's harbour.

h. Three.

i. None.

j. Nil.

k. Moored with chains and anchors.

l. The buoys are moored in about 10 fathoms.

m. By tender.

n. The buoys are distinguished by one being red and the other black.

o. Two.

VI. Conical in all cases.

VII. Semi-annual, at which time the buoys are changed.

VIII. None but as stated in answer to No. VII.

IX. Not classified.

X., a, b. The Round House, South Pier Head, erected in its presumed in 1621, and probably rebuilt in 1774; White Rock in 1815; the Sarderette, Grandbeaux, Flat Rock, Rousse, Petit Creux, Grand Aligante, Fauxconnaire, Barlette, Tremies, Moulinet, Anfré, and Coquelin, erected since the beginning of this century. The Corbette beacon on 4th April 1859.

c. The beacons (with the exception of the Fauxconnaire and the Coquelin) stand on rocks which are covered at high water. The two excepted are on the land, and serve as marks to steer by.

d. Its peculiar shape.

e. The beacons on the rocks are of wood, those on the land are built with stone.

f. Some are white, others black, and others red.

g. The Round House on the south pier head is capped with a lantern lighted with gas, and serves as a pier light.

h. The pier light is about 40 feet; the other beacons are about ten feet, with the exception of the Fauxconnaire, which is about 150 feet, and the Coquelin, say 200 feet.

i. The rock beacons cost from 5*l.* to 50*l.* each.

j. The buoys, beacons, and light at the pier head cost about 85*l.* annually.

k. No income.

GUERNSEY.

GUERNSEY.

GUERNSEY.

- XI. No change.
- XII. Dangers are buoyed or marked, where thought necessary, and deficiencies supplied on application or petition to the aforesaid authorities.
- XIII. Dangers are buoyed or marked, where thought necessary, and deficiencies supplied, on application or petition to the aforesaid authorities.
- XIV., XV., XVI. The buoys and beacons, being considered part of the expenditure for the safety of shipping, are maintained from the revenues of the harbours.
- XVII. A petition signed by several pilots and masters of vessels, and sent in at the latter end of 1854, for a beacon on the Corbette Rock, was immediately considered and granted, and the beacon erected on the 4th April 1859.
- XVIII. No.
- XIX. By the harbour master of St. Peter's Port in May and November 1857, and in May and December 1858.
- XX. By the aforesaid harbour master each year in the summer season.
- XXI. By advertisements in the local papers.
- XXII. The harbour master.
- XXIII. The harbour masters have the means of reporting daily to the superior.
- XXIV. None.
- XXV. No.
- XXVI. None, it being a part of the harbour master's duties to inspect the same and report thereon.

- IV. Not sufficiently.
- V. A light on the Hanvis, now about to be erected, is much wanted; buoys and beacons are wanted; some will be placed shortly. The harbour light is defective, but it is believed it will soon be replaced by a better.
- VI. 1st, at the entrance of the Small Russel; 2d, on Longue Pierre, and also on Grunes Rocks, both near St. Martin's Point; 3d, on "Grunes au Nord," three miles north-west of Coho Bay; 4th, on "Sambule," south-west of said "Grunes au Nord;" 5th, on "Pêtes d'Aval," south of Ferrières, south of "Jethon;" 6th, on a rock called "Blanchard," east of Sark. Nos. 1 and 2 are petitioned for by all the captains in the trade, and will shortly be erected. No. 3. The want of a beacon, within my recollection, has caused the loss of several vessels. No. 4. The loss of two vessels, at least. No. 6. The loss of two vessels. No. 5 is the extremity of a long reef of rocks, which vessels coming from the Great Russel for the roadstead and harbour, have to round; and although there are good marks for those that know them, it would be well if the extremity of the reef were buoyed; and although accidents do not occur, vessels frequently give them so wide a berth as to lose much time very needlessly.
- VII. Gas.
- VIII. None.
- IX. Several buoys and beacons have occasionally been removed by gales and accidents, but are always replaced.
- X. The following list of vessels, whose loss and stranding I attribute to the absence of the Hanvis Light, "Grunes au Nord" beacon, &c. —

LYOYD'S EVIDENCE.

- I. Henry Tupper, Les Cotils, magistrate of the Royal Court of Guernsey, and many years Lloyd's agent.
- II. ISLAND of GUERNSEY.
- III. The States of Guernsey.

No.	Date.	Names.	Rig.	Nation.	From.	Cargo.	Bound to.	Wind.	Lives Lost.
1	—	George and William	Brig	English	—	Ram	London	S.W.	
2	1853. Dec. 30	Vrow Catherina	Galliot	Holland	Zante	Currants	Rotterdam	W.	All hands
3	1856. Jan. 29	Alfred Anne	Briz	French	Rouen	Ballast	Paimpol	W.	
4	1840. Dec. 3	Eliza	Ship	America	St. Petersburg	Hemp	United States	S.W.	Two lives.
5	1840. May 27	Le Vertueux	Cmarée	French	Charente	Brandy	Havre	S.W.	
6	1841. Jan. —	Name unknown	—	—	—	Butter	Kiel	W.	
7	1843. Dec. —	Sheerwood	Bark	America	—	Cotton	Cowes	W.	All hands.
8	1845. Jan. 5	Susan	Schooner	English	London	Ballast	Jersey	N.W.	
9	1845. Oct. 7	Union	Schooner	French	Rouen	General cargo	Brest	W.	
10	1845. Jan. 30	Emanuel	Bark	America	N. Brunswick	Timber	Hull	E.	
11	1845. May 3	Five Sisters	Brig	English	Lisbon	Salt and cork	Leith	S.W.	All hands.
12	1845. Nov. 24	Ses. Wich	Brig	English	Sierra Leone	Timber	London	S.W.	
13	1849. Dec. 10	Ancoma	Ship	America	New Orleans	Cotton	Havre	S.W.	Eight lives.
14	1850. Jan. —	Napoleon	Brig	French	—	Wines &c.	—	—	
15	1850. Nov. 16	L'Europe	Bark	French	Cuba	Sugar	Havre	N.W.	Thirteen lives.
16	1850. Dec. 15	Little Britain	Schooner	English	St. Michael's	Oranges	London	W.	
17	1850. Dec. 17	Ste. Anne	Cmarée	French	Brest	Empty pipes	St. Malo	W.S.W.	
18	1850. Dec. 19	Onelda	Ship	America	New York	Cotton	Havre	N.N.W.	
19	1851. Dec. 1	Frederick	Cmarée	French	Bayonne	General cargo	Rouen	S.W.	
20	1851. May 11	Reformation	Dandy	English	Southampton	Timber	Jersey	S.	
21	1852. Nov. 20	Louman	Dandy	French	Tunis	Oil	Rouen	N.N.W.	
22	1853. Jan. 10	Daring	Schooner	Guernsey	Guernsey	Ballast	St. Michaels	S.E.	All hands.
23	1853. May 27	George and Elizabeth	Cutter	English	Coronathen	Furniture	Jersey	N.E.	
24	1853. Nov. 24	Victoche	Schooner	French	Llanely	Coals	Regneville	N.W.	All hands.
25	1857. April 4	Trois Susannes	Cmarée	French	Rouen	Empty pipes	Yannes	S.W.	Three lives.
26	1857. May 18	Caroline	Brig	Jersey	Paraiha	Hides and sugar.	Jersey	S.W.	
27	1858. Jan. 5	Boadica	Bark	Shields	Alexandria	Cotton seeds, &c.	Antwerp	N.N.E.	Nine lives.
28	1858. Nov. 30	Name unknown	Galliot	—	—	—	—	—	
29	1859. Nov. 27	Esther	Cutter	French	St. Malo	Oak	Guernsey	N.W.	All hands.
30	1859. Nov. 6	Offspring	Bark	English	Monte Video	Ballast	Shields	N.W.	

WRECKS ON JERSEY.

1	1852. May	Vibilia	Bark	America	St. Andrews	—	London	—	
2	1853. Feb.	Caroline	Brig	English	Newcastle	—	Jersey	—	
3	1845. Dec.	Justin Theodore	—	French	Bordeaux	—	St. Malo	—	
4	1849. April	Nabob	Ship	English	Calcutta	—	London	—	
5	1851. Nov.	Ceres	Brig	English	Newfoundland	—	Poole	—	
6	1857. Nov. 19	Bonne Melida	Schooner	French	Bordeaux	—	Rouen	—	
7	1857. April 4	Gronigon	—	—	Demerara	—	Rotterdam	—	Seven lives.

GUERNSEY.

GUERNSEY.

GUERNSEY.

GUERNSEY.

- Circular VI. XI. None.
 XII. None.
 XIII. Differently coloured; some are floating buoys, but most are beacons fixed on the rocks.
 XIV. The present arrangement is good, but the number is insufficient.
 XV. None are levied specifically in respect of buoys and beacons. The harbour dues sanctioned by order in Council include everything, and the pier light; and the buoys and beacons are maintained out of the fund raised by the payment of these dues.
 XVI. I have complained of the absence of the beacon on the "Grunes au Nord" on two different occasions, but nothing has been done.
 XVII. A petition from the masters frequenting the port has lately been presented to the States, praying for the buoys at the entrance of the Small Russel, and for the beacons off St. Martin's Point, which will, I presume, be attended to; the feeling I believe to be that the States do as much as their means allow them.
 XVIII. There can be no feeling against dues that do not exist.
 XIX. The dues now levied are at present strictly applied to harbour improvements.
 XX. None adverse to the management of the local buoys and beacons; but the trade of this island with Great Britain is now made to pay nearly 3,000*l.* a year, in respect of lights, pilotage, Dover and Ramsgate dues, &c. &c., and that most unjustly, in consequence of its being treated as an oversea trade, in lieu of a coasting trade, in respect of lights, buoys, beacons, pilotage and harbour dues, as it essentially is.

- XIV. No.
 XV. No specific dues are levied on shipping in respect of local lights, buoys, or beacons.
 XVI. I know of none.
 XVII. That the light (on the pier head) is not efficient, but a change respecting this light is now in contemplation, and a requisition signed by several masters of vessels for an increase in the number of buoys and beacons has been handed over to the proper authority.
 XVIII. Vide answer to query XV.
 XIX. As above.
 XX. I am not aware of any.

Observed by Commander

The Channel Islands were visited by Admiral Hamilton, Captain Ryder, and Mr. Graves.

11th May 1860.—We ascertained that the building of a lighthouse on the Hanois Rock, at the south-west extremity was commenced.

Mr. Saumarez Carey, supervisor of the works and treasurer of the States, informed us that he had control over the funds expended on harbour purposes. The Island of Alderney is under the jurisdiction of the States of Guernsey. Under an Order of the Queen in Council of 28th July 1856, the harbour dues are liable to charges for erecting lights, buoys, and beacons, in order to facilitate navigation.

The following witnesses were examined:—

Mr. H. Tupper, magistrate, who confirmed his evidence given to Captain Ryder (see p. 10, England Local Authorities), produced a list of wrecks, stating that between the years 1835-50, 18 wrecks had occurred on the west coast of Guernsey, owing to its not being properly lighted.

The wrecks, he says, take place chiefly in the morning; the tides are very treacherous, and the inward draught is much more rapid than the outward ebb.

The lighthouse on Hanois should be high enough to throw rays to the horizon over the Island of Lihou, which would to a great extent meet the wishes of those who preferred that the lights should be placed on Lihou. Mr. Tupper admitted that the harbour light was very indifferent, but stated that it was intended to move it, and improve it when the harbour was completed. Within the last few months, since Captain Ryder's visit, a beacon on Longue Pierre and another on Les Grunes de Jerbourg have been ordered by the States. For two years the propriety of placing two buoys at the entrance of the Little Russel has been under discussion, but they are not yet in position. No toll is levied for harbour light; but 6*d.* per ton, harbour dues (the maximum) is now levied; a reduction is made in favour of coasters.

Vessels from Guernsey (if being considered as over sea) pay to the Mercantile Marine Fund for light dues, &c. 2,300*l.* a year more than if the Channel Islands were considered within the limits of the coasting trade. See the following items:—

For the year 1858 - Excess on lights	-	900
" " - Excess on Ramsgate	-	800
passing toll	-	600
" " - Excess on pilotage	-	600
		£2,300

And Jersey pays about 1,700*l.* in excess under the same heads.

Captain Le Fevre, R.N., desired to press upon the Royal Commission the great importance of making the Hanois light very distinct in character from any English light, for which it might otherwise be mistaken as the Start, Scilly, Bishop, &c.

Commander P. De Saumarez R.N., of H.M.S. *Dasher*, desired to state that he agreed with the preceding evidence.

Circular VI.

1. Nicholas Le Messurier, harbour master, Guernsey.
 2. The Harbour of ST. PETER PORT, and the Coast of GUERNSEY generally.
 3. The "superviseur de la chaussee" for the harbour light, buoys, and beacons.
 4. They are not.
 5. The buoys and beacons now in position cannot be better placed, and are sufficiently well distinguished. The light on the South Pier Head (harbour light) is defective.
 6. The following additional buoys and beacons have been suggested:—1. A bell buoy on the west side, at the entrance of the Small Russel; 2. A buoy on the Rock Platte Boue, on the east side of the Small Russel; 3. A beacon on the Rock "La Grune," south of St. Martin's Point; 4. A beacon on the rock "Longue Pierre," west of St. Martin's Point, and are now under consideration by the Legislature of the island; also a lighthouse is about to be erected by the Trinity Board on the Hanois Rocks, south-west of Guernsey.
 7. The St. Peter Port Harbour Light (the only one in use) is lighted with gas.
 8. On the 8th September, 1856, the Harbour Light was extinguished for about twenty minutes, for want of water in the meter; no accident occurred in consequence.
 9. None have been displaced within the last few years.
 10. I cannot; but I really believe that many accidents might have been avoided had there been a light on the Hanois Rocks.
 11. No tide signals are used, nor do I think any necessary; our pilots generally know well, by the rocks, the depth of water (if any) at the Pier Heads.
 12. No fog signals are used; the bell buoy stated in answer to query VI., with the numerous beacons along the coast, will, I consider, answer every purpose.
 13. The buoys and beacons now in use are painted, some white, some red, others black; the beacons are all different in their shape, no particular system being adopted; the danger or guiding buoys are conical, and the mooring or warping barrel-shaped.

GUERNSEY and HARTLEPOOL.

Commander F. W. Sidney, commander of the Admiralty Survey in the Channel Islands, gave the following evidence, to which we attach great importance, as it emanates from an officer of considerable experience.

Thinks the Little Russel Channel ought to be lighted as soon as possible, by two leading lights, one placed further out than the present pier light, and the other on the land behind. The new pier light should be masked towards St. Martin and Sardriere shoals.

Commander Sidney recommends that the Sardriere and Les Grunes du Bois shoals be marked, and that a buoy be placed on the Boue Agenor shoals.

He approves of the project of the States to mark with buoys the Plat Boné and the Plat Fougere, and of beacons being placed on the Longue Pierre, and Les Grunes de Jerbourg.

Mr. Burney, Master, R.N., late Master of H.M.S. Dasher, having had very considerable experience in the navigation of the Islands, stated that he entirely agreed in all Commander Sidney's suggestions.

Peter Olivier, commanding the *Caroline* of Guernsey, 49 tons, trading to France and England, agreed with the statements regarding the great want of lights, buoys, and beacons, stated that he thought French lights inferior to the English, and that they were lit much later and extinguished much earlier than the English lights.

Pilots George Hughes and Richard Whitford, agreed with Commander Sidney's proposed sites for buoys; and the first suggested, in addition, that the Caval shoal should be buoyed.

Admiral Hamilton and Captain Ryder crossed the Island to see the site of the Hanois Lighthouse.

HARTLEPOOL.

HARTLE-
POOL.
Circular III.

- XXVI. None.
XXVII. None.
XXVIII. Forty.
XXIX. Lighthouse, 3,200*l.* 15*s.* 1*d.*; adjoining buildings, 443*l.* 11*s.* 10*d.*; annual ground rent, 5*l.*
XXX. Finished in 1847.
XXXI. Lantern 14 feet diameter by 10 feet height of glass. Cost about 460*l.*
XXXII. Not purchased; was built out of the general fund of the Commissioners.
XXXIII. The repairs have been so trifling as scarcely to be worthy of notice.
XXXIV. Exterior of tower not painted or coloured; the interior costs about 5*l.*
XXXV. Two keepers, 52*l.* each per annum; are allowed house rent, gas, and water, say for each, 9*l.* per annum.
XXXVI. About 950*l.*
XXXVII. Comparatively trifling, say 2*l.* per annum.
XXXVIII. No oil or wicks in use; is lighted by gas, at an annual cost of about 38*l.*
XXXIX. Nil.
XL. None used.
XLI. None used.
XLII. General fund of the Hartlepool Port and Harbour Commissioners.
XLIII. No special income for the lights.
XLIV. About 162*l.* per annum.
XLV. None.
XLVI. None.
XLVII. None.
XLVIII. None.
XLIX. None.

L. Is under the general superintendence of the haven master.

LI. This may be assumed as almost daily.

LII. No.

LIII. Two spare burners kept in lighthouse.

LIV. One rain gauge.

LV. Yes; a red light by night, placed below the principal light; and a red ball on a mast by day, which signals are exhibited from half flood to half ebb.

LVI. None.

LVII. Every six hours.

LVIII. See enclosed copy.

31. HARTLEPOOL.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Hartlepool Heugh.
- II. Hartlepool Port and Harbour Commissioners.
- III. William Davison, Town Wall, Hartlepool.
- IV. One principal white light, with a red tide light underneath.
- V. February 1845.
- VI. Hartlepool Port and Harbour Commissioners.
- VII. Owing to the prominence of the headland.
- VIII. 1st October 1847.
- IX. Matthew Carter, builder; Stephen Robinson, engineer. Built by contract.
- X. First order, catadioptric; red light.
- XI. Freestone, solid; not coated with color.
- XII. No specific conductor. The interior fittings, from top to bottom, being of iron, act as one.
- XIII. 73 feet 7 inches.
- XIV. Eighty-four feet.
- XV. Ten and a half miles.
- XVI. About 15½ miles.
- XVII. Two hundred and fifty-two degrees. N. ¼ W. round eastward to W.S.W.
- XVIII. Fixed white light.
- XIX. Stationary.
- XX. Sunset to sunrise.
- XXI. Catadioptric.
- XXII. First order, with one burner.
- XXIII. No alteration, and none suggested.
- XXIV. Glass obtained of Messrs. Swinburn, of Newcastle, but the apparatus was constructed, under the direction of the engineer, at Hartlepool.
- XXV. Simply by six tubes leading from the exterior to the interior of the tower.

BUOYS AND BEACONS.

Circular V.

- I. Hartlepool Port and Harbour Commissioners.
- II. See accompanying chart and plan.
- III. Not responsible to any superior authority.
- IV. None.
- V. See plan and sketches accompanying this return.
 - a. Some are plate iron, and some are wood or pipe staves.
 - b—f. See marginal notes referring to the sketch in the accompanying plan.
 - g. At the storeyard in the harbour.
 - h. See marginal notes in plan.
 - i. Four of the plain class.
 - j. By vessels fouling them when entering or leaving the harbour.
 - k. With chain and sinker.
 - l. See marginal notes in plan.
 - m. Not by open tender.
 - n. By its peculiar form, combined with other distinguishing features, colour, &c. See accompanying plan.
 - o. Nine in number.
- VI. A buoy of an egg form, similar to that shown by the accompanying sketch.

HARTLE-
POOL.
Circular V.

HARTLEPOOL and HAYLE.

- VII. No fixed periods, but at all times when repairs or cleaning are required.
- VIII. Surveyed fortnightly, and invariably after storms from the sea.
- IX. See sketch in accompanying plan. Similar rules apply to this beacon as previously mentioned with respect to buoys.
- X. One only, as per sketch.
- a. No particular name.
 - b. First erected in the year 1845.
 - c. For marking the western point of the rocks on the north shore of the bay.
 - d. Surmounted by an iron wicker ball and vane. See sketch.
 - e. Wooden stalk, with iron stays and braces, the stalk copped up to about 10 feet above low water.
 - f. Black.
 - g. Not lighted.
 - h. Vane 21 feet above high-water spring tides.
 - i. First cost of erection 50*l*.
 - j. Nothing within the periods mentioned.
 - k. No income derived from it.

XI. Those shown on the accompanying plan are the most approved at the port of Hartlepool, and iron is invariably substituted for wood as the old material becomes unserviceable.

XII. Black buoys on the starboard and white buoys on the port hand entering the channel. Middle grounds should all be marked by buoys chequered and striped.

XIII. All beacons should be black if situated in the water.

XIV. From the general port fund.

XV. From the general port fund.

XVI. No special income derived for this purpose.

XVII. No applications made.

XVIII. None made.

XIX. By the haven master. Dates cannot be furnished.

XX. Same as preceding.

XXI. Through the medium of "The Shipping and Mercantile Gazette."

XXII. The haven master.

XXIII. All the objects in question are daily under the eye of the haven master.

XXIV. None have been made in either case.

XXV. The buoy of the egg-shape (balanced by the water), as represented by the sketch in the accompanying plan, has been substituted for one similar to that represented by the sketch with the staff and ball, and the advantages are found to be the following : By its floating vertically it is seen at a much greater distance ; it rides much easier, has much less motion, and thereby does away with a considerable quantity of friction or waste, which invariably takes place in the chain where the light works upon the bottom, thus rendering a considerable saving in the cost of the moorings.

XXVI. No rules nor regulations are issued.

XXVII. No remarks to make of a general nature, except that the mooring buoys within the limits of the Commissioners harbour are not included in this return. This is under the supposition that such is not required.

LLOYD'S EVIDENCE.

- I. Jos. Mellanley, L.A., West Hartlepool.
- II. HARTLEPOOL and DISTRICT.
- III. Master and assistants appointed by Sunderland.
- VII. Lighted by gas.
- XV. Paid by vessels sailing out of harbour.

32. HAYLE.*

33. HULL.

LIGHTHOUSES.—(GENERAL RETURN.)

- I. The Master, Wardens, and Assistants of the Guild, Fraternity, or Brotherhood of the most Glorious and Undivided Trinity, and of St. Clement, in the parish of Deptford Strond, in the county of Kent, commonly called the Corporation of the Trinity House of Deptford Strond.
- II. Killingholme high lighthouse; Killingholme south low lighthouse; Killingholme north low lighthouse; Paull lighthouse; Stallingborough light.
- III. The selection of positions in which the lighthouses and the lights exhibited therein may serve as leading marks by night and day, and so facilitate the navigation of the River Humber.
- IV. In the Humber, 80 feet.
- V. Catoptric.
- VI. To obtain a good illuminating power for lighthouses of this class.
- VII. Fixed.
- VIII. That a fixed bright light is best suited for a leading mark, and that colour is introduced when the actual bearing of the light is required to be known to mark any particular danger. Thus the three lights at Killingholme are fixed bright lights. Stallingborough is a fixed bright light. Paull shows a fixed bright light until abreast of the Skitter Sand End Buoy, when the light appears red, to show the necessity for altering the course of the vessel.
- IX. Drawing herewith, marked A.
- X. Sent herewith, marked B.
- XI. Oil is supplied by contract, tested by the buoy master and approved of by the Buoyage and Beaconage Committee, and care is taken that all stores supplied are of good quality.
- XII., XIII. Not considered necessary.
- XIV. None.
- XV. No separate account in respect of "lighthouses" is kept. The lighthouses are all maintained out of the old buoyage and beaconage dues; the increased income from which, owing to the increase of trade, has enabled the Corporation to maintain these lighthouses without any additional charge on shipping.
- XVI. It is presumed that by the term "General Authority" here used, "Local Authority" is meant. Suggested improvements are submitted to the whole Board of the Corporation, who, if thought requisite, refer the subject to the Committee, who obtain such scientific assistance as they may think fit.
- XVII. Here again the term "General Authority" is supposed to mean "Local Authority." The only application made since 1st October 1853 was one on the 16th May 1859, which was complied with.
- XVIII. The inspection and management of the lighthouses is vested in the Committee. The lightkeepers are required to transmit returns monthly, stating the quantity of oil consumed and the particulars of stores received and expended, and also to observe the general rules and regulations specified in the annexed Form, marked C.
- XIX. The three lighthouses at Killingholme are included in one special return, being connected as leading marks for the river.

KILLINGHOLME.

The High and South Low Lights are a leading mark for the mid channel below Killingholme, and to keep vessels clear of the sands or shoals on each side of the river, between Killingholme and Spurn.

The High and North Low Lights are a leading mark for the channel above Killingholme, and to keep vessels clear of the sands and shoals between Killingholme and Paull.

PAULL.

A fixed bright light is seen in this lighthouse between Killingholme and Paull, or until abreast of the Skitter Sand End Buoy, which bears from the lighthouse S. W. by W. $\frac{1}{2}$ W., when the light suddenly changes to a fixed red light, and continues so until the length of the elbow buoy, when it again changes to a fixed bright light, and continues so up to Hull Roads.

HULL
Circular

Circular VI.

HULL.

STALINGBOROUGH.

This light is seen in coming up the Humber about mid-way up the Bureum, and exhibits the brightest light when bearing W. S. W., when good anchorage may be found for large ships below the Holm Ridge, or in the Sunk Upper Roads. In proceeding further up the river the light disappears altogether when the length of the Holm buoy.

TABLE OF PRICES.

Catoptric. 6 Burners.			
Price	-	-	Fixed. 21 <i>l.</i> 6 <i>s.</i> 11 <i>d.</i>
Ordinary repairs	-	-	About 17 <i>l.</i>
Oil	- {	Consumption	- 7½ gallons.
		Cost	- 1 <i>l.</i> 5 <i>s.</i>
Wicks	- {	Consumption	- Eight.
		Cost	- 4 <i>d.</i>
Catoptric. 3 Burners.			
Price	-	-	Fixed. 85 <i>l.</i> 3 <i>s.</i> 3 <i>d.</i>
Ordinary repairs	-	-	About 5 <i>l.</i>
Oil	- {	Consumption	- 3½ gallons.
		Cost	- 12 <i>s.</i> 6 <i>d.</i>
Wicks	- {	Consumption	- Four.
		Cost	- 2 <i>d.</i>
Catoptric. 1 Burner.			
Price	-	-	Fixed. 5 <i>l.</i> 10 <i>s.</i> 7 <i>d.</i>
Ordinary repairs	-	-	About 1 <i>l.</i>
Oil	- {	Consumption	- 3 quarts.
		Cost	- 2 <i>s.</i> 6 <i>d.</i>
Wicks	- {	Consumption	- Two.
		Cost	- 1 <i>d.</i>

} Lights at Kingholme.

} Light at Hull.

} Light at Stalingborough.

On the 2d of August, 1859, the Commissioners obtained the following information from the Secretary to the Corporation at Hull:—

The corporation is very ancient. Any master of a merchant ship who trades or has traded out of Hull, or any port within the limits of the jurisdiction of the Trinity House at Hull, may become a YOUNGER BROTHER on passing an examination. The number of Younger Brethren is unlimited. The examination is passed before the governing body, which consists of TWELVE ELDER BROTHERS and SIX ASSISTANTS, in all 18. The whole body choose annually two STEWARDS from amongst the Younger Brethren. Their duty is to audit the accounts. When a vacancy occurs amongst the Elder Brethren the whole body choose from amongst the past stewards one to be assistant, and the remaining Elder Brethren choose from the assistants one who becomes an elder brother. They choose by a majority of votes; but practically the choice goes by rotation.

The whole body choose annually, on the 1st of September, two WARDENS from amongst the Elder Brethren. An elder brother receives from 90*l.* to 100*l.* a year, an assistant about 45*l.*, say 1,400*l.* or 1,500*l.* in all. The receipts of the wardens and stewards were not stated. There is a staff of clerks, and there are other office bearers.

The duties of the corporation are,—the care and management of the lights, buoys, and beacons within their jurisdiction.

From the testimony of all persons who were questioned on the subject, these duties appear to be efficiently performed; and from a personal inspection of the lights, &c. in the Humber, the Commissioners find no reason to think otherwise, though in the several particulars mentioned below they thought the lights inferior to others under other jurisdictions. No complaints of the lights, buoys, or beacons in the Humber were made to the Commissioners.

The corporation support a naval school, to which any seaman's son is eligible. It was visited and found to be remarkably well conducted.

They also support extensive charities. There are 334 pensioners, who live in 11 almshouses or hospitals. These are wives and widows of masters of merchant ships, who have served 60 months out of ports within the jurisdiction, and decayed masters who have served during a like period.

The lights, buoys, and beacons are all maintained out of buoyage dues, as stated below.

HULL.

The school and charities are supported from the income of estates, and from primage dues levied on shipping.

On the 3d of August, on leaving the Humber, the Commissioners agreed, that the lights under the Trinity House of Hull appear to give satisfaction to those who use them. They were seen from the points where they were required on a fine night; and those which were inspected were found to be well kept by the men entrusted with them. But though the lights may be considered generally sufficient for their purpose, and the houses and vessels amply so, still the illuminating apparatus is inferior to that used by the General Lighthouse Boards, and, in one instance, is decidedly bad in principle.

The apparatus, as stated by the authorities, is generally manufactured in Hull; there is no open tender. After visiting French shore lights of the same class, the Commissioners are of opinion that they are superior to the Humber lights. The new pier light at Berwick-upon-Tweed is also far superior.

STALINGBOROUGH LIGHTHOUSE.—
(SPECIAL RETURN.)

HULL.
Circular III.
Observations
by Commis-
sioners.

Circular III.

- I. Stalingborough.
- II. The Master, Wardens, and Assistants of the Guild or Brotherhood of the most Glorious and Undivided Trinity, and of St. Clement, in the parish of Deptford Strond, in the county of Kent, commonly called the Corporation of the Trinity House of Deptford Strond.
- III. The Guild or Brotherhood of Masters and Pilots Seamen of the Trinity House in Kingston-upon-Hull.
- IV. One light only.
- V, VI. Suggested by the Buoyage and Beaconage Committee of the Trinity House, Hull, in the year 1849.
- VII. Being the most suitable position to denote the approach to the sunk Upper Roads and Holm buoy.
- VIII. 25th August 1849.
- IX. The light is placed in the window of the Ferry House, at Stalingborough.
- X. River light.
- XI. Brick; drab.
- XII. Not fitted with a lightning conductor.
- XIII. About 12 feet.
- XIV. About 10 feet.
- XV. About six miles.
- XVI. About six miles.
- XVII. One hundred and twenty degrees N. ¼ E. to S. E. by E.
- XVIII. Fixed; bright.
- XIX. See 18.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. One burner.
- XXIII. None.
- XXIV. Thomas Purdon.
- XXV. By a funnel leading out of the lightroom.
- XXVI. None.
- XXVII. See XXVI.
- XXVIII. None kept.
- XXIX., XXX. Not built by the Corporation; built for a Ferry House.
- XXXI. No lantern. Light exhibited from a room altered and fitted for the purpose at a cost of 28*l.* 12*s.* 9*d.*
- XXXII. Not purchased.
- XXXIII. The repairs, painting, and coloring are not executed by this Corporation.
- XXXIV. See XXXIII.
- XXXV. One keeper; salary, 20*l.* per annum.
- XXXVI. 5*l.* 10*s.* 7*d.*
- XXXVII. For the year ending September 1857, 1*l.* 2*s.* 6*d.*; September 1858, 1*l.* 3*d.*
- XXXVIII. Eighty-three gallons oil; 15 dozen wicks.
- XXXIX. Refined pale rape, the price of which in 1857 was from 4*s.* to 4*s.* 2½*d.* per gallon, and in 1858, 3*s.* 6*d.* per gallon.
- XL. French lamp wicks, made of cotton, price 6*d.* per dozen; cost for 1857 and 1858, 7*s.* 6*d.*
- XLI. None used.
- XLII. From the buoyage and beaconage dues levied on ships and vessels passing or having the benefit of any of the floating and shore lights, buoys, and beacons, and the dues are payable at the office of the Trinity House, in Hull.

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- XLIII., XLIV. No separate account in respect of "Lighthouses" is kept; the lighthouses are all maintained out of the old buoyage and beaconage dues, the increased income from which, owing to the increase of trade, has enabled the Corporation to maintain this light without any additional charge on shipping.
- XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. The Buoyage and Beaconage Committee.
 LI. Not less than four times a year, and as much oftener as circumstances required.
 LII. No.
 LIII. One spare lamp. The oil is stored in the lightroom.
 LIV. None.
 LV. Not used; not considered necessary.
 LVI. None; not considered requisite.
 LVII. The keeper, with his family, reside at the lighthouse, and is not relieved.
 LVIII. See Rules and Regulations annexed.
- This light was observed from the "Vivid" on the night of the 2d of August 1859. It was very bright when opposite to it; less bright in other directions. It appeared to be the brightest light in the Humber. It stands 88 on the list of lighthouses visited or seen alight.

Circular III.

KILLINGHOLME LIGHTHOUSE.—(SPECIAL RETURN.)

- I. { High Light
 South Low Light } Killingholme.
 North Low Light }
- II. The master, wardens, and assistants of the Guild, Fraternity, or Brotherhood of the most Glorious and Undivided Trinity, and of St. Clement, in the parish of Deptford Strond, in the county of Kent, commonly called the Corporation of the Trinity House of Deptford Strond.
- III. The Guild or Brotherhood of Masters and Pilots Seamen of the Trinity House in Kingston-upon-Hull.
- IV. Three lighthouses—
 The High Light bears from the North Low Light S. by W., distance 780 feet.
 The South Low Light bears from the High Light S.E., distance 620 feet.
 The North Low Light bears from the South Low Light N. by W. $\frac{1}{2}$ W., distance 1,240 feet.
- V., VI. Suggested by the Buoyage and Beaconage Committee of the Trinity House of Hull, in the year 1835.
- VII. To serve as leading marks between Spurn and Killingholme, and between Killingholme and Paull.
- VIII. High Light and South Low Light, 30th December 1836. North Low Light, 15th January 1852.
- IX. Will. H. Hearfield, Builder, and Fras. Dales, Surveyor of the High Light and South Low Light, and Messrs. Hutchinson and Musgrave, Builders, and Will. Foale, Surveyor of the North Low Light, all built by contract.
- X. River lights.
- XI. High Light, brick, solid, coated with cement and painted red.
 South Low Light, brick, solid, coated with cement, and painted white.
 North Low Light, inner and outer wall, cemented and painted red.
- XII. Not fitted with lightning conductors.
- XIII. High Lighthouse - 80 feet 6 inches.
 South Low Lighthouse 46 " 3 "
 North Low Lighthouse 46 " 9 "
- XIV. High Light { Up Light - 66 feet 1 inch.
 Down Light 67 " 3 "
 South Low Light - 32 " 6 "
 North Low Light - 34 " 0 "
- XV. High Light may be seen 12 miles.
 South Low Light may be seen 9 miles.
 North Low Light. This may be seen on the river at a distance of 6 miles, and beyond that it is shut in with the land.
- XVI. High Light may be seen about 14 miles.
 South Low Light may be seen about 10 miles.
 North Low Light may be seen not more than 6 miles on the river.

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- XVII. High Light, 163 degrees N. by W. to S.E. by S. $\frac{1}{2}$ S.
 South Low Light, 85 degrees, E.N.E. to S.E. by S. $\frac{1}{2}$ S.
 North Low Light, 90 degrees N. by W. to E. by N.
- XVIII., XIX. Fixed lights.
 XX. Sunset to sunrise.
 XXI. Catoptric.
 XXII. High Light - 3 lamps, 1 burner each.
 South Low Light 2 " 1 "
 North Low Light 1 " 1 "
- XXIII. None.
 XXIV. Thomas Purdon.
 XXV. From gratings under the gallery and through the dome.
 XXVI. No fog signals used.
 XXVII. No fog signals used.
 XXVIII. No register of fogs kept.
 XXIX. The first cost of High Lighthouse and South Low Lighthouse was, for buildings, 79*l.* 15*s.*, and for ground and conveyance, 145*l.* 14*s.* 5*d.*; and the North Low Lighthouse, including lantern, 702*l.* 2*s.* 9*d.*; and the ground and conveyance 94*l.* 1*s.* 5*d.*
- XXX. Finished.
 XXXI. The inside diameter of each lantern is 8 feet 6 inches; the cost of the lanterns, for the High and South Low Lighthouses was about 420*l.* The cost of the lantern in the North Low Light cannot be stated, as it was included in the builders' contract.
 XXXII. Was not purchased.
 XXXIII. The average annual cost of repairs and alterations for five years ending September 1858, for the three lighthouses, amounts to 104*l.* 13*s.* 6*d.*, done partly by contract and partly by days' labour.
 XXXIV. The cost of painting or colouring is included in the average annual cost of repairs and alterations of buildings just given, and coated once in two years.
 XXXV. One keeper to each light; each having a salary of 52*l.* per annum, and allowance of coals and oil.
 XXXVI. The entire cost of illuminating apparatus, fitting, and transport for the High Lighthouse and South Low Lighthouse amounted to 180*l.* 13*s.* 2*d.*, and for the North Low Lighthouse to 34*l.* 13*s.* 9*d.*; these sums included tinner's ware.
 XXXVII. 1857, year ending September, 15*l.* 14*s.* 4*d.*; exclusive of carriage.
 1858, year ending September, 18*l.* 0*s.* 5*d.*, exclusive of carriage.
 XXXVIII. Five hundred and ninety-six gallons oil, and 62 dozen wicks, for the three lighthouses.
 XXXIX. Refined pale rape oil; the price of which in 1857 was from 4*s.* to 4*s.* 2*d.* per gallon; and in 1858 the price was 3*s.* 6*d.* per gallon.
 XL. French lamp wicks made of cotton, price 6*d.* per dozen; cost for 1857 and 1858, 31*s.*
- XLI. Not used.
 XLII. From the buoyage and beaconage dues levied on ships and vessels passing or having the benefit of any of the floating and shore lights, buoys and beacons, and the dues are payable at the office of the Trinity House in Hull.
 XLIII., XLIV. No separate account in respect of "lighthouses" is kept. The lighthouses are all maintained out of the old buoyage and beaconage dues, the increased income from which, owing to the increase of trade, has enabled the corporation to maintain these lighthouses without any additional charge on shipping.
- XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. The Buoyage and Beaconage Committee.
 LI. Not less than four times a year, and as much oftener as circumstances required.
 LII. No.
 LIII. The spare lamps, burners, &c. are for the
 High Light - - 3.
 South Low Light - 2.
 North Low Light - 1.
 The oil is stored in a room under the lantern in each lighthouse.
 LIV. None.
 LV. Not used; not considered necessary.
 LVI. None; not considered requisite.
 LVII. The keepers, with their families, reside at the lighthouses, and are not relieved.
 LVIII. See Rules and Regulations annexed.

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On the evening of the 1st of August it was remarked that the two lighthouses coloured white were more clearly seen against the land than the third contiguous lighthouse coloured red; and that a light vessel coloured red, and seen against the sea, was very distinctly seen shortly before. The lights were observed from the "Vivid" on the night of the 3rd of August. They were burning well; they were brilliant as seen from certain positions, but, like other reflector lights, were less bright when seen from other positions. They appeared to be well placed for showing the channel, and were seen from a considerable distance. They were considered to be fit for their position, at least, in fine weather. These lights stand 85, 86, and 87 on the list of lights visited or seen alight.

PAULL LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Paull Lighthouse, on the River Humber.
- II. The Master, Wardens, and Assistants of the Guild, Fraternity, or Brotherhood of the most Glorious and Undivided Trinity and of St. Clement, in the parish of Deptford Strond, in the county of Kent, commonly called the Corporation of the Trinity House of Deptford Strond.
- III. The Guild or Brotherhood of Masters and Pilots Seamen of the Trinity House in Kingston-upon-Hull.
- IV. One lantern showing two lights.
- V., VI. Suggested by the Buoyage and Beaconage Committee of the Trinity House of Hull in the year 1835.
- VII. As a leading mark to clear the Holm Sand and Skitter Sand.
- VIII. 30th December 1836.
- IX. Builder, W. H. Hearfield; surveyor, Fras. Dales. Built by contract.
- X. River lights.
- XI. Brick; solid; coated with cement, and painted red.
- XII. Not fitted with lightning conductor.
- XIII. Forty feet.
- XIV. Thirty-four feet.
- XV., XVI. Five miles is about the distance the light may be seen in a direct line on the river.
- XVII. One hundred and eighty degrees, S. $\frac{1}{4}$ W. to N. $\frac{1}{4}$ E.
- XVIII., XIX. This is a bright fixed light up to the Skitter Sand End buoy, No. 7, when it shows a red light, and continues so up to the Elbow Buoy, No. 8, when it again shows a bright light.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. Three lamps, with one burner to each.
- XXIII. This was originally a bright light, but to improve the navigation the red light was added, 1st March 1852, at the suggestion of the Buoyage and Beaconage Committee.
- XXIV. Thomas Purdon.
- XXV. From gratings under the gallery and through the dome.
- XXVI. No fog signals used.
- XXVII. No fog signals used.
- XXVIII. No register of fogs kept.
- XXIX. First cost of building, 262*l.* 15*s.* 4*d.*; ground, 62*l.* 2*s.*
- XXX. Finished.
- XXXI. Inside diameter 8 feet 6 inches; cost of lantern was about 200*l.*
- XXXII. Was not purchased.
- XXXIII. The average annual cost of repairs and alterations for five years ending September 1858 is 8*l.* 11*s.* 5*d.*
- XXXIV. The cost of painting or colouring is included in the average annual cost of repairs and alterations of buildings just given, and coated once in two years.
- XXXV. One lightkeeper, salary 55*l.* per annum, and allowance of coals and oil.
- XXXVI. The entire cost was 85*l.* 3*s.* 3*d.*, including tinnors' ware.
- XXXVII. For the year ending September 1857, exclusive of carriage, 6*l.* 3*s.* 9*d.*. For the year ending September 1858, exclusive of carriage, 4*l.* 15*s.* 6*d.*
- XXXVIII. Three hundred gallons of oil and 37 dozen wicks.
- XXXIX. Refined pale rape oil, the price of which, in 1857, was from 4*s.* to 4*s.* 2½*d.* per gallon, and in 1858 the price was 3*s.* 6*d.* per gallon.
- XL. French lamp wicks, made of cotton, price 6*d.* per dozen; cost for 1857 and 1858, 18*s.* 6*d.*
- XLI. Not used.

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XLII. From the buoyage and beaconage dues, levied on ships and vessels passing or having the benefit of any of the floating and shore lights, buoys and beacons, and the dues are payable at the office of the Trinity House in Hull.

XLIII., XLIV. No separate account in respect of "light-houses" is kept. The lighthouses are all maintained out of the old buoyage and beaconage dues, the increased income from which, owing to the increase of trade, has enabled the corporation to maintain this light without any additional charge on shipping.

XLV. None.

XLVI. None.

XLVII. None.

XLVIII. None.

XLIX. None.

L. The Buoyage and Beaconage Committee.

LI. Not less than four times a year, and as much oftener as circumstances require.

LII. No.

LIII. Three spare lamps. The oil is kept in a room under the lantern.

LIV. None.

LV. Not used; not considered necessary.

LVI. None; not considered requisite.

LVII. The keeper with his family resides at the lighthouse, and is not relieved.

LVIII. See Rules and Regulations annexed.

RULES AND REGULATIONS OF THE KEEPERS OF THE LIGHTHOUSES.

The lightkeeper is required to obey and observe all such orders, rules, and directions as he may receive from the corporation, or from the committee for the management of the buoyage and beaconage of the Humber relating to the care and management of the lighthouse, and the regulation and exhibition of lights and signals therefrom, or otherwise concerning the buoyage and beaconage service.

He is also required to keep the lanterns of the lighthouses, and the lamps, reflectors, machinery, windows, and every part of the apparatus necessary for properly exhibiting the lights, in a perfectly clean state and condition.

He is also expressly prohibited from permitting the lights to be meddled or interfered with, managed, or regulated by any person other than himself.

He is also required to exhibit, watch, and regulate the lights for such and so many hours or periods of time on each and every night throughout the year as the corporation, or their buoyage committee, shall direct, and in all other respects to use his utmost endeavours to carry into complete effect the object and intention of the corporation in establishing and maintaining the lighthouse, by regular exhibition of such lights by night and signals by day, in order that the shipping frequenting the river may receive and enjoy every possible advantage therefrom, and so that no interruption in the exhibition thereof may at any time take place.

The lightkeeper is also required constantly to reside at the lighthouse (except for such periods of time as shall be allowed by the corporation or by the buoyage committee), and not to suffer any person other than himself and the members of his own family to reside in the lighthouse.

The lightkeeper is required, on his appointment, to enter into a bond containing the above conditions, and with a stipulation not to quit the charge and care of the lighthouse without receiving a notice for that purpose from the corporation, or without giving to the corporation one calendar month's previous notice in writing of his intention to quit; and further, that on quitting the charge or care of the lighthouse he will deliver up the same in a tenable and orderly condition, together with the lamps, oil, furniture, and apparatus, and all registers, journals, books, accounts, documents, and writings, goods, chattels, and effects belonging to the corporation, which may be in and about the lighthouse, or which may have been entrusted to his care or custody.

This establishment was visited from the "Vivid" Observations by Commissioners. at 9-30 p.m. on the night of August 2nd 1859. The building is coloured red, and has a very comfortable dwelling house attached. The light was burning and very well kept; the spare lamps trimmed and ready. The three reflectors are small; they were clean, but scratched. The red is produced by a red glass in front of one reflector; the others show a white light in different directions. The keeper is an old sailor, and seemed to take a great pride in his work. He is married and has eleven children. His

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orders are,—to light at sunset and extinguish at sunrise by the almanack. The light was also observed from the "Vivid." It was not powerful, but seemed sufficient for its purpose, at least, in fine weather; it stands 84 on the list of lights visited or seen afloat.

has much increased since the introduction of steam vessels.

The spare lightship. The lantern of this lightship can be readily adapted to either a red or white light.

Circular II. HEBBLES AND BULL FLOATING LIGHTS.—
(GENERAL RETURN.)

- I. The Master, Wardens, and Assistants of the Guild, Fraternity, or Brotherhood of the most Glorious and Undivided Trinity, and of St. Clement, in the parish of Deptford Strond, in the county of Kent, commonly called the Corporation of the Trinity House of Deptford Strond.
- II. "This authority" is presumed to mean the local authority of the Trinity House of Hull. Bull Sand floating lightship; Hebbles Sand lightship, and lightship.
- III. The selection of positions in which the lightships and the lights exhibited therein may serve as marks to clear the sands (near which they are placed) by night as well as by day.
- IV. One, moored in the Victoria Dock. Crew supplied from the lightship requiring to be replaced, or in an emergency from the crew of the buoy yacht. The spare lightship is fully equipped with stores.
- V. The Bull and the Hebbles Floating lightvessels are so far apart that one cannot be mistaken for the other, but the former is capable of being distinguished from the latter, and from other vessels, by day as being marked in large white letters on each side, "Bull," the latter in the same manner, "Hebbles," and both are painted red, with a red ball at the masthead. At night the "Bull" exhibits a bright white light, and "Hebbles" a bright red light.
- VI. Yes; in their brightness and magnitude.
- VII. Catoptric.
- VIII. To obtain a sufficient illuminating power for the distance within which the lights are useful.
- IX. Fixed.
- X. To prevent the possibility of their being mistaken for other lights, and as the Newsand Floating Light is revolving, it was thought that a fixed bright light was best suited for the Bull, and colour was introduced into the Hebbles in order to distinguish it from the light at Paull, and from ships' lights.
- XI. See table annexed marked A.
- XII. See drawing annexed, marked B.
- XIII. To obtain sufficient sound to warn vessels from approaching too near the sands or the lightships.
- XIV. Tide signals not used.
- XV. None.
- XVI. No separate account of income in respect of lightships is kept. The floating lightships are maintained out of the old buoyage and beaconage dues, the increased income from which, owing to the increase of trade, has enabled the corporation to establish and maintain these lightships without any additional charge on shipping.
- XVII. It is presumed by the term "general authority," here used, that local authority is meant. Suggested improvements are submitted to the whole Board of the Corporation, who, if it be thought necessary, refer the subject to the Buoyage and Beaconage Committee, who obtain such scientific assistance as they may think fit.
- XVIII. The inspection and management of the lightships is vested in the committee. The masters of the lightships are required to transmit returns monthly, stating the quantity of oil consumed, and particulars of stores received and expended, and also to observe the general rules and regulations specified in the annexed form, marked C.
- XIX. Here again the term "general authority" is supposed to mean local authority. No application has been made since 1853.
- XX. The Bull lightship is not only a mark for the Bull Sand, but serves as a guide to clear the Inner Binks, and on entering or leaving the Humber when the Killingholme lights cannot be seen. The Hebbles lightship is not only a mark for the Hebbles Sand, but serves as a guide to clear the Skitter and other sands on the south side of the Humber, between Hull and Paull, and is indispensable to the safe navigation of this channel in the night time, and the necessity of navigating it during the night

HEBBLES FLOATING LIGHT.—(SPECIAL RETURN.)

- I. Hebbles Lightship, moored in the Hebbles Channel, in the River Humber.
- II. About 3 fathoms. Bottom, silt; tide, 4 to 5 knots.
- III. See General Return.
- IV. The Guild or Brotherhood of Masters and Pilots Seamen of the Trinity House, in Kingston-upon-Hull.
- V. No written application was made by the trade, but the lightship was placed on this station at the recommendation of the Buoyage and Beaconage Committee, in order to facilitate the navigation of the Humber by night.
- VI. To serve as a mark to clear the Hebbles and other sands between Hull and Paull.
- VII. Since 26th December 1839.
- VIII. Only one light exhibited.
- IX. Length, 50 feet; breadth, 14½ feet; depth, 9½ feet.
- X. Wood.
- XI. Fifty tons.
- XII. At Hull, by Edward Gibson and Son.
- XIII. 6 feet aft; 5 feet forward.
- XIV. Red.
- XV. Marked "Hebbles" in large white letters on each side, and a red ball at the masthead.
- XVI. One mast, foresail and mainsail.
- XVII. Not fitted with lightning conductors.
- XVIII. Single moorings; two spare anchors and chain cables on board.
- XIX. Mushroom anchor, about 20 cwt., with 15 fathoms ¼ inch ground chain, to which is attached 90 fathoms 1 inch chain. The two spare anchors are 6 cwt. each, and the cables each 90 fathoms of ¾ inch chain.
- XX. Todd and Campbell, of Hull, made the mushroom anchor. The chains were purchased of Thos. Clark, of Hull.
- XXI. Twenty feet.
- XXII. About five miles.
- XXIII. About six miles.
- XXIV., XXV. A fixed red light.
- XXVI. Sunset to sunrise.
- XXVII. Catoptric.
- XXVIII. Eight burners.
- XXIX. A new lantern, with lamps in gimbals, was purchased in September 1846, at the suggestion of the Buoyage and Beaconage Committee.
- XXX. Wm. Wilkins, London.
- XXXI. The lantern is suspended by a chain round the mast, and the lamps are fixed round the lantern.
- XXXII. Bell.
- XXXIII. Fifty days.
- XXXIV. No meteorological register is kept.
- XXXV. 1,096*l.* 8*s.* 6*d.*
- XXXVI. 1,356*l.* 1*s.* 8*d.*
- XXXVII. Ordinary expenditure, 32*l.* 8*s.* 3*d.* Extraordinary ditto, 1*l.* Not by contract.
- XXXVIII. Six, including the master.
- XXXIX. Master, 4*l.* 15*s.*; mate, 3*l.* 12*s.* 6*d.*; seamen, 3*l.* per month.
- XL. For the year ending September 1858, 187*l.* 10*s.*, exclusive of coals, water, and medical attendance.
- XLI. See answer to last question.
- XLII. About 75*l.*
- XLIII. First lantern, 212*l.* Second ditto, with gimbals, 343*l.* 5*s.* 2*d.*
- XLIV. 1857, 4*l.* 12*s.* 10. 1858, 6*l.* 4*s.* 2*d.*
- XLV. 1857, oil, 200 gallons. 1858, oil, 207 gallons. 1857, wicks, 50 dozen. 1858, wicks, 49 dozen.
- XLVI. Refined pale rape. The price, in 1857, was from 4*s.* to 4*s.* 2½*d.* per gallon; and in 1858, the price was 3*s.* 6*d.* per gallon. The annual cost in 1857, 38*l.* 6*s.* 8*d.*; 1858, 39*l.* 13*s.* 6*d.*
- XLVII. French lamp wicks, made of cotton, price 6*d.* per dozen. 1857, cost 1*l.* 5*s.*; 1858, cost 1*l.* 4*s.* 6*d.*
- XLVIII. About 7*l.*
- XLIX. From the buoyage and beaconage dues levied on ships and vessels passing or having the benefit of any of the floating or shore lights, buoys and beacons, and the dues are payable at the office of the Trinity House, in Hull.
- L., LI. No separate account in respect of lightships is kept. The lightships are all maintained out of the old

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buoyage and beaconage dues, the increased revenue, from which, owing to the increase of trade, has enabled the corporation to maintain the light without any additional charge on shipping.

- LII. None.
LIII. None.
LIV. None.
LV. None.
LVI. None.
LVII. None.

LVIII., LIX. By the Buoyage and Beaconage Committee. Not less than four times a year, and as much oftener as circumstances required. The lightship was also frequently visited by the buoy master.

LX. No.

LXI. 1853, December 25, the chain broke in a gale of wind at W.N.W.; off the station 6 hours during the day only. 1855, February 18, taken from the station to Hull, on account of the large and unusual quantity of heavy ice in the river, and returned to her station 2nd March; her place being temporarily supplied by a large ice buoy.

LXII. None.

LXIII. She has a boat with life buoy and 60 fathoms line attached, ready for immediate use.

LXIV. Being in sight of Hull not required by day, rockets and blue lights used by night.

LXV. Not used; not considered necessary.

LXVI. The crew is relieved once a month, two being on shore during the winter months, and three during the summer months; the master three weeks per quarter. The men when on shore are employed in the day time at the buoy yacht, buoy shed, and on general business connected with the buoyage and beaconage department.

LXVII. A buoy yacht is kept for this and general purposes connected with the buoyage and beaconage department.

LXVIII. Yes, in the Victoria Dock at Hull, ready to replace the other in three or four hours.

LXIX. The person in charge of the lightship is required to transmit a return monthly, stating the quantity of oil consumed, and particulars of stores received and expended, and also to observe the general rules and regulations specified in the annexed form marked C.

This vessel was boarded from the "Vivid" at 10 minutes past 9 p.m., on the 2d of August. It stands No. 83 on the list of lights visited or seen alight. The lamps were in process of lighting, and it appeared to the Commission that it was decidedly too late. There are eight reflectors hung on gimbals. They were clean but scratched, as is usual in floating lights. The red colour is produced by covers of red glass placed in front of the reflectors. The light is said to be visible at a distance of five miles.

The crew consists of a master and mate and four men, three of whom are afloat and three on shore. The master stated that he had been 40 years at sea, and had crossed the Atlantic 60 times, and that he "had never seen such a nasty sea as on this station." It is short and cross. It was breaking right over him on Sunday and on Monday also. The vessel is 50 feet long; he considers her to be perhaps 30 too short. The vessel was clean and in good order. No meteorological instruments are kept. A log is kept. The master's rule for lighting is when he loses sight of the buoys; there are no printed regulations on board. The statement relative to the sea may be contrasted with that of the master of the Seven Stones floating light moored off Scilly, and that of the master of the Spurn, moved outside the Humber. The light was afterwards seen from the Paull light. It was very dim. On leaving Paull light it was again observed and compared with the ordinary town lights at Hull. The gas lamps were distant about five miles, and were more clearly seen than the Hebbles light distant about three. It is inferior to other floating lights which have been seen, but it is probably sufficient for its purpose.

BULL FLOATING LIGHT.—(SPECIAL RETURN.)

I. Bull lightship; moored on the east side of the bull sand in the River Humber.

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II. In 5½ fathoms. Bottom, silt. Tide, about 4 knots.

III. See General Return.

IV. The Guild or Brotherhood of Masters and Pilots Seamen of the Trinity House in Kingston-upon-Hull.

V. 4 February, 1830. The Shipowners' Society forwarded a requisition to this corporation, signed by several ship masters belonging to the port.

VI. To serve as a mark to clear the Bull Sand.

VII. Since 1832.

VIII. Only one light exhibited.

IX. Length of keel for tonnage, 74 feet. Breadth, moulded, 18 $\frac{6}{12}$. Breadth, extreme, 18 $\frac{11}{12}$. Depth in hold, 10 $\frac{6}{12}$.

X. Iron.

XI. 120 $\frac{1}{4}$ tons.

XII. At Hull; by Messrs. Gibsons, Clifford, and Brown.

XIII. 8 feet aft, 7 feet forward.

XIV. Red.

XV. Marked "Bull" in large white letters on each side, and a red ball at the masthead.

XVI. One mast, foresail and mainsail.

XVII. Not fitted with lightning conductor.

XVIII. Single moorings; two spare anchors and chain cables on board.

XIX. Mushroom anchor, 30 cwt., with 20 fathoms, 1½ inch ground chain, to which is attached 90 fathoms, 1½ inch chain. The two spare anchors weigh about 12 and 10 cwt., and the cables are each 90 fathoms 1 inch chain.

XX. Thompson and Stather, Hull, made the last mushroom anchor, and Abbott and Co., of Newcastle, the china.

XXI. Twenty-five feet.

XXII. About 6 miles.

XXIII. About 7 miles.

XXIV., XXV. A fixed white light.

XXVI. Sunset to sunrise.

XXVII. Catoptric.

XXVIII. Eight burners.

XXIX. None.

XXX. W. and I. Walker, Hull.

XXXI. The lantern is suspended by a chain round the mast, and the lamps are fixed round the lantern.

XXXII. Bell.

XXXIII. Six days are recorded in the log book, but the master states that the bell was frequently used for a short period only on other days.

XXXIV. No meteorological register is kept.

XXXV. 2,888l. 16s.

XXXVI. 3,515l. 18s. 11d.

XXXVII. Ordinary expenditure, 48l. 4s. 1d.; extraordinary expenditure, 7l. 7s. 9d. Not by contract.

XXXVIII. Eight, including the master.

XXXIX. Master 5l. per month; mate 4l. per month; seamen 3l. per month.

XL. For the year ending September 1853, 251l. 7s. 6d., exclusive of coals, water, and medical attendance.

XLI. See answer to last question.

XLII. The last mushroom anchor and chain cost 81l. 14s. 3d. XLIII. 212l.

XLIV. For the year ending September 1857, 2l. 6s. 3d.; for the year ending September 1858, 11s. 3d.

XLV. Oil, 214 gallons in 1857; 211 $\frac{3}{4}$ gallons in 1858. Wicks, 80 dozen in 1857; 84 dozen in 1858.

XLVI. Refined pale rape, the price of which in 1857 was from 4s. to 4s. 2½d. per gallon, and in 1858, 3s. 6d. per gallon. The annual cost in 1857, 43l. 13s. 10d.; in 1858, 37l. 16s.

XLVII. French lamp wicks, made of cotton, per dozen; cost for 1857, 40s.; 1858, 42s.

XLVIII. About 9l.

XLIX. From the buoyage and beaconage dues levied on ships and vessels passing or having the benefit of any of the floating or shore lights, buoys, and beacons, and the dues are payable at the office of the Trinity House in Hull.

L., LI. No separate account in respect of lightships is kept. The lightships are all maintained out of the old buoyage and beaconage dues, the increased revenue from which, owing to the increase of trade, has enabled the corporation to maintain this light without any additional charge on shipping.

LII. None.

LIII. None.

LIV. None.

LV. None.

LVI. None.

LVII. None.

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LXVIII., LIX. By the Buoyage and Beaconage Committee. Not less than four times a year, and as much oftener as circumstances required. The lightship was also frequently visited by the buoy master.

LX. No.

LXI. 1856, February 8, fouled by a vessel; off the station 7 hours during the day only. 1858, March 6, the chain cable broke in a gale of wind at N.W.; off the station 6 hours during the day only.

LXII. None.

LXIII. The lightship has a boat, and also a life buoy, with 60 fathoms of line attached, always ready for use. A life boat, with a crew of 11 men, is stationed at Spurn Point, under the control and management of this Corporation.

LXIV. Watson's telegraph code of signals is used by day, and rockets and blue lights by night.

LXV. Not used, not considered necessary.

LXVI. The crew is relieved once a month, three being on shore at a time during the winter months, and four during the summer months; the master three weeks per quarter. The men when on shore are employed in the day time at the buoy yacht, buoy shed, and on general business connected with the buoyage and beaconage department.

LXVII. A buoy yacht is kept for this and general purposes connected with the buoyage and beaconage department.

LXVIII. Yes, in the Victoria Dock at Hull, ready to replace the other in three or four hours.

LXIX. The person in charge of the lightship is required to transmit a return monthly, stating the quantity of oil consumed, and particulars of stores received and expended, and also to observe the general rules and regulations specified in the annexed form marked C.

RULES and REGULATIONS for MASTERS of FLOATING LIGHTVESSELS.

The master is required to maintain proper obedience in the crew appointed or placed under his care to all his reasonable orders and commands, and to keep and observe such directions as he may from time to time receive from the Corporation of the Trinity House of Hull, or from their Buoyage and Beaconage Committee for the time being, to be signified to him by such committee or by the clerk to the wardens for the time being of the said Corporation. He is also required to keep a constant and regular exhibition of such lanterns and lights by night, and signals by day, as he shall from time to time be ordered and directed to exhibit by the said Corporation, or their said committee, in order that the shipping frequenting the river may receive and enjoy every possible advantage therefrom. He is also required to remain and reside on board the lightvessel at all times (except for such periods of time as shall be allowed him by the said Corporation or their said committee to be signified by writing, under the hand of the said warden's clerk), and to keep the vessel in a clean and orderly state and condition, together with all her boats, stores, and appurtenances, and particularly the lanterns, lights, and signals, with the several apparatus, matters, and things belonging thereto, so that no delay or interruption in the exhibition thereof may take place.

The master is required on his appointment to enter into a bond containing the above conditions, and with a stipulation not to quit the charge or command of the vessel without receiving a month's notice for that purpose from the corporation or without giving to the corporation one month's previous notice in writing of his intention to quit, and further that, on quitting the charge or command of the vessel, he will deliver up the same with her boats, ropes, stores, tackle, and apparatus, and account for all such as shall or may have been necessarily worn out or consumed or unavailably lost, and also deliver up all registers, journals, books, accounts, documents, and writings whatsoever which may have been entrusted to his care or custody, or which may then be in his possession, or which he can come by.

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"thinks his vessel would ride still better if she were longer." The vessel was well kept.

There are four reflectors with two lamps in each, fixed, not hung on gimbals, as in Trinity lightvessels, and in the Hebbles. These were very well cleaned, and but little scratched; but they appeared to be very ill contrived for making the most of the light produced by lamps of a very inferior construction.

"When the vessel rolls the oil is thrown out of the lamps," and, the oil cistern being in front of the reflectors, it is impossible that half the small amount of light produced can be used. Several persons had mentioned this as the worst light in the Humber. Others had praised it as a good light. It may be sufficient for its purpose, but the illuminating apparatus was certainly the worst that had been seen, and is entirely out of keeping with the vessel, which seemed to be good. She is of iron, and lined with wood only in the master's cabin. Like other iron floating lightvessels, she is very cold in winter, very hot in summer, and sweats in particular states of the atmosphere.

The master victuals the crew, and has 1s. 9d. per day for the purpose. He has 20l. from the telegraph company for working the semaphore on board. There are no spare reflectors as in other floating lights. No meteorological instruments. The master has a clock of his own. There is a medicine chest, and there are printed regulations on board. The Trinity House (of Hull) visit, perhaps, once a year.

TABLE OF PRICES.

Catoptric.—8 Burners.			
Price	-	-	Fixed, 212l.
Ordinary repairs	-	-	About 2l.
Oil	- {	Consumption	5½ gallons.
		Cost	17s. 1d.
Wicks	- {	Consumption	Twenty-four.
		Cost	1s.
Catoptric.—8 Burners.			
Price of lantern at present	-	-	343l. 5s. 2d.
in use	-	-	-
Ordinary repairs	-	-	About 5l.
Oil	- {	Consumption	5 gallons.
		Cost	16s. 8d.
Wicks	- {	Consumption	Ten.
		Cost	5d.

Light at the "Bull."

Light at the "Hebbles."

BUOYS AND BEACONS.

Circular

- I. The Guild or Brotherhood of Masters and Pilots Seamen of the Trinity House in Kingston-upon-Hull.
- II. This corporation's jurisdiction above Hull is not mapped out, but an Admiralty chart of the Humber, showing the positions of all the buoys, beacons, floating and shore lights, from Hull to the sea, accompanies this return. The cost of maintaining the buoys and beacons is included in the general expenditure connected with buoys, beacons, floating and shore lights, and no separate account for their maintenance and of the income derived from each can be stated. The number of buoys belonging to the establishment is 62, besides nine ice buoys occasionally used in the winter season. There are four beacons also belonging to the establishment.
- III. No, except as appears by the thirty-ninth section of the Merchant Shipping Act, 1859.
- IV. None.
- V. See diagram of each class herewith, marked D.
 - a. Nun buoys, made both of fir and oak. Can buoys made of oak. Nun wreck made of oak and iron
 - b. Fir nun buoys from 24l. to 26l. Oak nun buoys from 30l. to 32l. Oak can buoys from 25l. to Iron wreck buoys from 25l. to 30l.
 - c. About 1l. 5s. per buoy.
 - d. Cannot be stated, as much of the work is done by the crews of the light ships.
 - e. Seventeen nun buoys, 11 can buoys, and two wreck buoys (nun)

Observations by Commissioners.

This vessel was boarded from the "Vivid" on the 3d of August, at 6:30 a.m., and stands 89 on the list of lights visited or seen afloat. She is of iron, 83 feet long, and the master says, "she rides very easily." He has been on the Hebbles station, and "thinks this easier to ride in. It is a better vessel and a better station, though more exposed. The master has been on the river for 52 years, and

HULL.

- f. Duplicates of the buoys in position are kept in reserve, and 32 buoys are at present in the shed, four of which are to be used for buoying wrecks if necessary.
- g. The whole are kept in the buoy shed at Hull, built for the purpose.
- h. The whole are complete, and a sufficient number of moorings are also kept in the buoy shed for any ordinary demand.
- i. Twenty.
- j. Eighteen were damaged by collision, and two were driven from their moorings.
- k. By stone and chain.
- l. About 8l.
- m. By workmen employed for the purpose.
- n. o. No special means are applied other than color, number, balls, vane, and a varied description.

VI. Nun or nine pin buoys.

VII. They are thoroughly overhauled, repaired, and painted once a year.

VIII. The buoy yacht passes up and down the Humber not less than once a month. The Buoyage and Beaconage Committee also make periodical surveys. The Humber pilots are instructed to report immediately any shifting or displacement of the buoys.

IX. For the different kinds of beacons see the accompanying chart.

- X. a. b. Clee - - - - 13 August 1834.
- Donnanook - - - - 14 October 1835.
- Kilnsea - - - - 3 October 1840.
- Beacon Lamp at Hull - 2 April 1842.
- c. Clee Beacon to serve as a leading mark for vessels navigating the Humber. Donnanook and Kilnsea to distinguish the coast north and south of the Humber, and the beacon lamp at South End to serve as a guide to Hull Roads.
- d. By form and colour as shown in the accompanying chart.
- e. Wood, with the exception of the beacon lamp at South End, which is a lofty iron column.
- f. Clee - - - - Black supported on a white frame.
- Donnanook - - Red.
- Kilnsea - - - Black.
- Beacon Lamp at } Green.
- Hull - - - - }
- g. Not lighted except the Beacon Lamp at Hull.
- h. Clee - - - - about 64 feet.
- Donnanook - - - - " 60 "
- Kilnsea - - - - " 67 "
- Beacon Lamp - - - - " 34 "
- i. Clee - - - - £338 2 4
- Donnanook - - - - 210 4 5
- Kilnsea - - - - 382 10 8
- Beacon Lamp - - - - Not known.
- j. Clee - 1852 £12 17 6 1858 £2 0 0
- Donnanook " 6 13 10 " 2 2 0
- Kilnsea - " 1 0 0 " 3 1 1
- Beacon lamp " 18 6 8 " 18 6 8

(This corporation's proportion.)

k. There is no separate charge for beacons. They are maintained out of the general fund.

XI. The nun buoys are preferred to the can buoys, and are gradually replacing them as they are worn out. No improvement has been suggested in the beacons.

XII. The buoys are laid down for the purpose of marking the sands and dangers in the river. The buoys are all black on the starboard side coming up the river, and red with white ribbon on the port side. When a new danger shows itself the Buoyage Committee immediately survey it, and recommend to the whole board what in their opinion is the best means of warning navigators of such danger.

XIII. If the beacon is required for a leading mark the locality is surveyed by the Buoyage Committee, and the best site selected. If to distinguish coast, then a form of beacon readily distinguishable from others in the vicinity is determined upon and constructed.

XIV., XV. From the buoyage and beaconage dues levied on ships and vessels passing or having the benefit of any of the floating and shore lights, buoys, and beacons, and the dues are paid at the office of the Trinity House in Hull.

XVI. No separate account of income for buoys and beacons is kept, but the following is the total income and expenditure for the particular periods required as

HULL.

regards not only buoys and beacons but also floating and shore lights.

Income for the quarter ending June 1852	£667	6	3
do. do. do. June 1858	845	4	9
do. year do. Sept. 1852	3,916	8	3
Disbursements, year ending Sept. 1852	3,934	7	7
do. do. Sept. 1858	5,526	8	1

XVII. The Humber Conservancy Commissioners applied for a new buoy to be placed at the end of the old landing jetty at Hessele, and on the 15th May 1858 the application was complied with. No other application has been made, and the endeavours of the Buoyage Committee are always to anticipate such applications.

XVIII. The Trinity House of Deptford Strond concurred in an additional buoy being placed on the lower middle, 1st August 1855. In no instance have they not complied with or deviated from the original proposal.

XIX. The Buoyage and Beaconage Committee inspected the buoys—

1857.	1858.
April 20.	March 29.
June 9.	June 9.
August 12.	July 14.
September 10.	August 30.
October 6.	

The buoy master, as before stated, made his inspections once a month.

XX. There is a superintendent to each beacon resident near to them. The beacons are also inspected by the committee as occasion requires.

XXI. The buoys when off their station are generally replaced within a few hours, and any change made in the positions of buoys or beacons is forthwith advertised for the general information of mariners.

XXII. The buoy master is always in attendance with instructions to replace immediately any buoy that may be displaced.

XXIII. The pilots appointed by this corporation who are constantly passing up and down the river, have instructions to communicate immediately to the Trinity House.

XXIV. No such complaints or representations have been received.

XXV. No improvement on the nun buoy has been tried by this authority. The most important alteration and improvement in the buoys was the introduction of the nun buoy by the Committee in the year 1842. This description of buoy shows itself in the water better than the can buoy, particularly in a strong tideway.

XXVI. The inspection and management of the buoys and beacons is vested in a committee of the brethren of the Trinity House of Hull, all of whom are or have been mariners. They give such directions to the buoy master as circumstances require. The buoy master is also a mariner, and was for several years a Humber pilot, and he is exclusively employed in this service. No printed forms are in use.

XXVII. All the buoys on the south side of the Humber are coloured red, with a horizontal white stripe, and numbered 1 to 12, commencing with the sand hale buoy, and terminating with the westernmost buoy on the upper middle, opposite the town of Hull. The buoys on the north side are all black, and numbered 1 to 12, commencing with the outer binks buoy, and terminating with the upper hebbles buoy. The buoys on the middle sands or shoals in the lower part of the Humber are all chequered black and white. The hook buoy on the lower middle is painted white, and marked "hook middle."

The secretary informed the Commissioners on the 2d of August that the river above Hull is not buoyed, because the sands and shoals alter almost every spring tide. That this portion of the river is chiefly used by coasters, which are towed up; that dues are levied on all vessels going up to Goole and Gainsborough, but that no complaints are made by the owners of vessels. These statements were confirmed by the witnesses examined by the commission.

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Circular V.

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HULL—IPSWICH—JERSEY.

Observations
by Commis-
sioners.

The buoy yard was examined. A spare buoy was found ready to replace every buoy on the station, painted and numbered. The pilots and masters examined praised the system of buoyage in the Humber, and the efficiency of the management.

Thomas Lewis, master of the "Vigilant," said, "They are as good as can be." A pilot said that he had never known a vessel to go on shore there, and similar testimony was obtained from others.

The Hull system of buoyage, namely, black, right, red, left, entering, is the reverse of the Liverpool system, and wants the distinction of form which is adopted at Liverpool.

Circular VI.

LLOYD'S EVIDENCE.

- I. Stephen Oates, Great Grimsby, Lloyd's agent.
- II. GREAT GRIMSBY.
- III. Mr. John Newby, dock master, Great Grimsby.
- IV. Yes.
- VII. Oil is used for the Humber lights; gas is used for the harbour lights at Great Grimsby.
- XI. See code of day and night signals enclosed, approved by the brethren of the Trinity House, London.
- XII. No fog signals are used; in my opinion a bell on the Royal Dock pier head would be very useful in foggy weather.
- XIII. Two square buoys, painted black, are placed in the Royal Dock basin, one on each side the channel.
- XV. At Great Grimsby the Bull floating light, and Humber buoyage dues, are collected by Henry Trittan; say fourpence for every ten tons, as per ship's register.
- XVII. No complaints, to my knowledge.

IPSWICH.

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Circular III.

IPSWICH DOCK COMMISSION.

" V.

IPSWICH, 12th January, 1860.
I HAVE gone carefully through the queries sent by your Board, which seem to me to apply, but in very slight degree, to our river.

The jurisdiction of the Commissioners extends to Harwich Harbour.

We have no lights or beacons, the channel being merely partially buoyed with cask buoys.

These buoys are all shown on the Admiralty Charts of the river, one of which has been taken within the last few weeks.

There are no light or buoy dues whatever, the buoys being maintained by the Commissioners as conservators of the river.

Should the Board desire further information, I shall be most happy to supply any in my power.

I am, &c.,

PETER BN. LONG,

Clerk and Solicitor to the Commissioners.

J. F. Campbell, Esq.,
&c. &c.

35. JERSEY.

JERSEY.

Circular II.

" III.

" V.

Jersey, June 24, 1859.

I AM directed by the States Committee of Harbours of this island to forward you the enclosed act of the said Committee, together with copies of the reports of the Harbour Masters of St. Helier and Gorey therein referred to, which have been made in accordance to the request contained in your letter of the 4th instant (No. 397).

I have, &c.

J. F. Campbell, Esq.,
&c. &c.JOHN COUTANCHE,
Commis-au-Greffé.

Au Comité des Chaussées,

L'AN mil huit cent cinquante neuf, levingt-troisième jour de Juin. Le Député de St. Martin ayant remis devant le Comité les réponses des maîtres de Port de St. Helier et de

JERSEY.

Gorey, relativement aux questions envoyées par le Secrétaire de la Commission touchant les retours pour les "Buoys and Beacons" placés dans les environs de cette île, le Comité a chargé le Commis-au-Greffé de transmettre copie des dites réponses au dit Secrétaire sans délai. Pour et au nom du Comité.

JOHN COUTANCHE,
Commis-au-Greffé.Harbour Master's Office, St. Helier, Jersey,
June 6, 1859.

SIR,

I HAVE received your note of 1st instant, in which you inform me you have been directed by the President of the Committee of Harbours to forward me "Returns to Buoys and Beacons," and to request me to answer in writing the several questions asked, in order that the whole may be submitted to the Committee at their next meeting.

In answer, I beg to state, that with respect to the lights, I cannot do better than enclose you my communication of July last to Capt. J. Washington, R.N., Hydrographer to the Lords of the Admiralty. There has been no alteration since, and I have nothing to add to said communication.

As to beacons, I beg to state that I have fixed one of my invented swinging beacons on each of the following rocks, viz. :—

1. On "Sellette Rock." The tide rises about 24 feet above this rock spring tides. The beacon is painted black, and about 20 feet above the rock.

On "Huitriers" or "Oyster Rocks." The tide rises about 22 feet above these rocks spring tides. The beacon is fixed on the middle head, and about 28 feet above the rock.

On "Grune Malett." Covers about the same time as the "Huitriers." The beacon is painted different, as you will observe by the sketch subjoined by steering between these two beacons is the best channel for the inner or small roads. This beacon is about 1½ cable S.E. by S. of the "Huitriers."

On "Demie des Pas." This rock is about 5 feet above the "Huitriers." The beacon is painted black.

On "Frouquie Aubin." This rock is about 8 feet above the "Huitriers." The beacon is painted black, and is from 4 to 5 miles southward of "La Roque Point."

All the above beacons have been fixed in the last 12 to 8 years, and out of the revenue of the Harbour of St. Helier.

There are no buoys to indicate leading marks for any channel round the island.

I have, &c.

JNO. CHEVALIER,

Harbour Master for St. Helier.

To James Godfray, Esq.,
&c. &c.

NOTICE TO MARINERS.

(No 45.)

ENGLISH CHANNEL.—JERSEY.

Lights at St. Helier.

Hydrographic Office, Admiralty, London,
July 6, 1858.

THE Harbour Master at St. Helier, Jersey, has given notice that the following lights are exhibited all night for the guidance of vessels bound into the harbour of that place:—

A fixed white light from the lighthouse on Victoria or New South Pier Head, placed at an elevation of 31 feet above the level of the sea at high water, and should be visible in ordinary weather from a distance of about 6 miles.

A fixed red light from a lantern post on Albert Pier Head elevated 15 feet above high water, and visible in ordinary weather from a distance of about 3 miles.

A fixed blue light on the parapet of the Old North Pier at 477 yards to the N.E. by E. of the Albert Pier light, and it should be seen about 3 miles distant in ordinary weather.

A fixed red light from a lantern post on the Upper Pier Road, 680 yards to the E.N.E. of the Victoria Pier light at an elevation of 46 feet above high water, and also visible 3 miles in ordinary weather.

SEY.

JERSEY.

Vessels approaching the harbour by keeping the Albert Pier red, and Old North Pier blue lights in line, will pass a little to the westward of the Grune St. Michel, and to the eastward, but rather too close to "Les Huitriers" or Oyster Rocks.

The best approach from the westward will be the passage between the Oyster Rocks and the Bues, with the Victoria or New South Pier light in line with the Upper Pier Road red light, although this leads too close to the Grune au Dart and the Grande Vaudin.

(The bearings are magnetic, variation $21\frac{3}{4}^{\circ}$ West in 1858.)

By command of their Lordships,

(Signed) JOHN WASHINGTON,
Hydrographer.

This notice affects the following Admiralty charts:—Jersey Island, No. 62; France, North Coast, Cherbourg to Cape Carteret, No. 58; also Channel Directions by Captain Martin White, fourth edition, page 143, and British Islands' Lights' List for June 1858, Nos. 25, 25*, 26, 26*.

Harbour Master's Office, Gorey, Jersey,
June 17, 1859.

SIR,

In reply to your note relative to returns of buoys, beacons, &c., I beg to state, for the information of the Secretary to the Royal Commission, that the beacons and lights under my superintendance are as follows, viz.:

On "Lequervièrè Rock." The tide rises about five feet above the rock, ordinary spring tides. Upon this rock is a standing beacon painted black, with a "cross" at top, and about 15 feet above the rock.

On "Lecreull." The tide rises about 17 feet above the rock, ordinary spring tides. Upon this rock is a standing beacon painted black, with a large basket at top, and about 30 feet above the rock.

On "Frouques des Grèves." The tides rises about 14 feet above the rock, ordinary spring tides. Upon this rock is a standing beacon painted black, and about 30 feet above the rock; between these two latter beacons is a fine passage about three quarters of a mile wide, and is the best channel for entering Gorey Harbour.

On "Seymour Rock." This rock covers about the same time as Lequervièrè. Upon this rock is a standing beacon painted black, with an arm at top. This rock is about three cables' length E. N. E. from Seymour Tower. Nota.—This beacon is only useful as a leading mark.

On "Anquette." The tide rises about 14 feet above the rock, ordinary spring tides. Upon this rock a beautiful round granite tower is now building, which will be finished (weather permitting) about the middle of August next. The top of the tower will be about 10 feet above high water, ordinary spring tides; it will be surmounted by a mast and globe 15 feet high and 5 feet in diameter, which will place the globe about 25 feet above high water, spring tides. There is at present a beacon painted black, which will be removed as soon as the tower is completed. The rock lies S. E. by S. $\frac{1}{2}$ S. distant five and half miles from Gorey Pier Head.

There are no buoys to indicate leading marks. There is one large Government mooring buoy in the middle of Gorey Roads, where Her Majesty's ships often moor to.

There is a lighthouse on Gorey Pier Head, where a fixed light is kept burning throughout the year, from sunset to sunrise, placed at an elevation of 21 feet above the level of high water spring tides.

There is also a fixed light on the breakwater at St. Catherine's.

The within-mentioned beacons and Gorey harbour light have been fixed and maintained out of the revenue of harbours.

The buoy and St. Catherine's light have been fixed and maintained out of the revenue of Her Majesty's Government.

I have, &c.
(Signed) JOHN AMY,
Harbour Master of Gorey.

To James Godfray, Esq.
&c. &c.

NOTES BY CAPT. RYDER.

Captain Goodrich, commanding "Courier," Jersey packets, states that Green Rock off Point Corbière, south-west corner of Jersey, ought to be buoyed.

Rigdon Shoal, off north-west end of Jersey, should be marked.

Petit Grune and Hubaut Shoals, off Portelet Bay, should be buoyed.

JERSEY.

Pignonet and Petit Four should be buoyed.
Ronnaudière and Diamond Rocks should be marked, and Hungenette.

JERSEY.

Observations
by Commis-
sioners.

The harbour of Jersey be considered very indifferent, and stated that "Courier" pays as harbour dues 4l. 18s. at Jersey, and 3l. 18s. for Guernsey, every voyage. He stated that the Guernsey dues were at one time laid out on the island generally; but now strictly on harbour purposes. It is generally believed that this is not the case at Jersey, and considered that the only lights being merely harbour lights, are quite insufficient for navigation.

I left the "Courier" at Guernsey, and crossed to Jersey in the afternoon in one of the Weymouth packets.

We entered the harbour on a misty night. The approach was evidently very anxious work for the captain, although he was considered the most experienced pilot. There is no light until you get past Corbière. He said he would willingly contribute out of his own pocket towards the expense of a light on Corbière.

Examination at Harbour Master's Office.

Geo. Allix, pilot for 23 years.—Corbière should be lighted. Nature of light must depend on that of the neighbouring lights. Thinks red to the northward would be a useful mark to clear the rocks off the west coast.

- A buoy should be placed inside Grand Four.
- " " on Pignonet.
- " " Diamond Rock.
- " " Bouaudière.
- A beacon " Hingette.
- A bigger beacon " Denn des Pas.

Two leading marks should be placed on Verclut and La Coupe.

A fixed beacon on l'Echiquèze.

Edward Gallishaw, agent for Brighton company (who received one of our covering letters, but no mariners' questions), and Elias Neel, agent for Weymouth and Channel Islands steam packets, agreed in above list of required buoys and lights.

They stated that the island were afraid to ask the Trinity Board to build lighthouses at Corbière for fear of having to pay all the dues when once a collector was established.

There is a correspondence between the States and the Trinity House on the subject.

The two agents say their directors complain very much of inattention and want of distinct published accounts by the Harbour Board.

The harbour accounts were said to be published for the first time in any shape in 1858, but are even now said to be so puzzling as to confuse and mislead practised accountants. The lighting, buoying, and beaconing are supported out of the harbour dues.

Considering that the lighting and buoying was very inefficient, I made inquiries regarding the harbour dues, and was informed that there was a very large surplus every year, but how it was appropriated no one could ascertain. Also that in 1837 a law passed that the impôt on wine and spirits was to be divided, and one portion was to be appropriated to pay off the harbour debt. And on this account, and in opposition to the wishes of the commercial community, the harbour dues were retained at the present high rate, and yet the shipping derives no corresponding benefit. It is now stated by members of the commercial community that they doubt whether the portion of the impôt stipulated to be credited to the Harbour Committee has ever been so treated; they are under the impression that it has been expended for interior purposes. The impôt has been raised twice on the plea of the harbour works, viz., in 1840 and in 1846.

The harbour requires to be made efficient, being now merely a tidal harbour, and inferior to Guernsey. Yet, although the income would allow of a consider-

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Observations
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able sum being borrowed to improve the harbour and properly light and buoy its approaches, the whole of the surplus is carried over, or said to be, to the paying off of the debt. This causes great discontent to the shipping interest; and as the expense of lighting and buoying is not a separate charge, but a charge on the harbour dues, they have no remedy unless the accounts are published in a clear and distinct manner.

Judge De Quetteville, President of the Chamber of Commerce, was said to know all the pros and cons of the matter; but I was warned that it would be difficult to get him to speak out. The country influence is so strong in the Estates that it is said to be a hopeless task to persuade them to let daylight in on their harbour accounts.

Captain Chevalier, the harbour master, was away. He is the inventor of a remarkable floating beacon, a mast on gimbals. A ship passing over it neither injures herself nor it, as it is pressed down and rises again.

Judge Bisson, Chairman of Harbour Board.

Judge Le Galce.

De Ste. Croix.

— Aubyn.

Col. Hemery.

— Nicollo

} Commercial men.

Mr. George Orange, acquainted with nautical matters, has answered our questions—

States that the Jersey people would not ask for a light on Corbière until a light was first placed on Guernsey, where it was most wanted. Now that there is to be a light on Hanois, there ought to be one on Corbière; which, if a ship in passing Hanois had mistaken it for the Lizard or Start, would, when made ahead, inform her of her mistake.

States that it is a mistake to say Hanois or Corbière are so much required by Guernsey and Jersey ships. They are hardly ever wrecked. It is the foreigners who form the long list of wrecks.

Captain Amy, harbour master at Goree, a very intelligent man, states that Cape Gronoz would be the cape to light for the safety of foreigners. Cape Corbière is only a local object.

Query. If Trinity Board lit Gronoz, would island light Corbière?

Visited Goree. Light very indifferent. One Argand.

William Adams, pilot to "Mercury." Very intelligent. Agreed with above.

Circular VI.

LLOYD'S EVIDENCE.

I. Thomas Mallet, Lloyd's Agent and Merchant.

II. ISLAND OF JERSEY.

III. E. L. Bisson, Esq. President of the Committee of Harbours, Jersey.

IV. Yes.

V. None that I am aware of.

XI. None.

XII. The masters of the mail packets have suggested that a person should be appointed to fire occasional guns during fogs at the point near the Corbière Rocks.

XIII. See the harbourmaster's report to the committee of the harbours.

XIV. No.

XV. None.

XVI. I am not aware of any.

XVII. Refer to No. VI. query.

XVIII. None collected.

XIX. None.

XX. I am not. I herewith enclose copies of the harbourmasters of St. Helier and Gouray harbours to the Committee of harbours in this island which gives a full account of the lights and beacons used in this island, and also the bearings of the lights for the Harbour of St. Helier. The currents are so strong, buoys would not be of service round this island. The tower Anquette is completed. No alteration in the lights and beacons has taken place since the harbour master's report.—17th December 1859.

12th May 1860.—The Commission crossed to the Harbour of Goree, Jersey, in H.M.S. "Dasher," Commander P. de Saumarez.

14th May.—Examined witnesses at St. Helier. Mr. Matthew Gallishaw, Agent for Jersey Steam Packet Company, Mr. Elias Neel, Weymouth Steam Agent, agree in stating that it is the universal wish that Corbière, the south-west point of the Island, be lighted as soon as possible.

Captain Amy, commanding the steamer Rose, trading to St. Malo and Granville, and Pilots George Alea, 23 years branch pilot, and Philip Payne, 21 years branch pilot, are very desirous that Cape Corbière should be lighted.

The evidence given by them, with regard to buoys and beacons, confirmed that obtained by Captain Ryder, (see p. 21, England, Local Authorities.)

The Commissioners had an interview with the following members of the Harbour Committee:— Judge Bisson and Messrs. de St. Croix, Nicolle, and Le Gallais. The following Minute was drawn up of their evidence:—

"These gentlemen admitted that it was their duty to properly mark and indicate the approach to the harbour by lights, buoys, and beacons. They also stated that there was a large annual surplus on the harbour dues which was employed for no other purpose than the diminution of the harbour debt, and that a portion of the impôt, an import duty on spirits and wine [see p. 321,] had also been ordered by the States to be expended yearly in diminution of the harbour debt. Books, showing how the revenue received from the impôt had been expended, were sent for and examined, but no trace could be discovered of any record of such an annual application, nor was any distinct statement obtained as to the present state of the harbour debt. A letter was therefore addressed to the Harbour Committee, and they were requested to cause a table to be filled up, giving a detailed account of the receipts both from harbour dues, and impôt, and the expenditure since the harbour improvements commenced, so as to enable the Commissioners to form an opinion as to the state of the fund from which the money must be derived for the erection of those lights, buoys, beacons, &c., which are, in the opinion of all the witnesses examined urgently required for the safety of navigation."

The sites for a light, buoys, and beacons, suggested by the various witnesses examined by Captain Ryder, on the previous visit, (see pp. 310, 311,) and by the above-mentioned witnesses, were again pointed out by Mr. Burney, an experienced officer, late Master of H.M.S. Dasher, and the great advantages to navigation which would result from the light, buoys, and beacons being placed on them as soon as possible were stated most forcibly by him.

It would be advisable, in our opinion, for Commander Sidney to be directed, at an early period, to draw up a plan for lighting, buoying, &c. the approaches of St. Helier, Jersey, as he has done for Guernsey.

Advantage was taken of one of the Commissioners making a subsequent visit to Jersey, to instruct him to ascertain the reason of the remarkable delay of many months on the part of the Harbour Committee in furnishing the information required.

Captain Ryder, the Commissioner referred to, reports as follows:—

6th November 1860.—I have just returned from visiting the Island of Jersey, where I met by appointment Mr. Godfray, one of the Harbour Committee, who had undertaken to prepare the return required by the Royal Commission.

I made the following minute on my meeting with Mr. Godfray, and read it and the above-mentioned

JERSEY and LANCASTER.

Minute over to him before I left; he admitted the truth of both minutes. The harbour accounts appear to be kept in a most unbusiness-like manner. Mr. Godfray had been occupied for some months in endeavouring to draw up the return required, but had failed to do so. Some accounts for past years were not to be found at all; and as to ascertaining with any certainty the progress, if any, of the diminution of the debt, it appeared to be impracticable without the aid of a professional actuary, if then, so inextricable was the confusion. As I have at last ascertained from Mr. Godfray the fact regarding the appropriation of the surplus harbour revenue to other purposes, the tabular return is of no material consequence, but should be printed if it arrives in time.

Minute of meeting with Mr. Godfray.—“In attempting to ascertain the state of the harbour account since the new works commenced, the following difficulty was stated by Mr. Godfray:—“Mr. Le Sueur, who was treasurer from 1847–52, died within the last named year. His accounts were most probably lodged *à greffe*, but cannot now be found owing to the office being changed. His family decline to allow his books to be inspected, on the ground that his accounts have been passed and approved. The surplus revenue for these years cannot therefore be ascertained. In 1853, 5th November, the Governor, Bailie, and Jurats took upon themselves to incur the responsibility of paying off Harbour Debentures to the amount of 42,811*l.* 6*s.* 9*d.* from the impôt, leaving for the harbour account as a charge on the harbour dues 34,249*l.* 14*s.* 3*d.* (Jersey currency.)

“Notwithstanding a surplus of annual harbour receipts from harbour dues, varying from 2,000*l.* to 4,000*l.* since 1856, which, it is admitted, has accumulated since that date to 15,000*l.*, no trace can be found of its appropriation towards the diminution of the harbour debt; it has been otherwise appropriated. The treasurer admits in the ‘re-capitulation, December 1859,’ that the balance against him on account of the harbour is 15,000*l.* The statements of the shipowners and others given to me at my preceding visit, regarding the appropriation of harbour dues to purposes other than reduction of the debt, are therefore fully confirmed.”

The above figures were carefully taken down by me from Mr. Godfray’s statement, and read over to him, but while admitting the accuracy of the minute he did not appear, by any means, certain of the amount.

It is only due to Mr. Godfray to state that he appeared to have every desire to give me clear and explicit information; he admitted with regret that he was prevented from doing more than give me the above general statement by the extraordinary method that had been adopted of keeping the accounts. Amongst all the numerous local authorities having charge of lights, buoys, and beacons, that I have visited, the Harbour Committee at Jersey appear to give the least satisfaction, and most deservedly so, to the shipping interest. It appears to be very problematical whether they will ever efficiently light and buoy the approaches to the harbour, until they are obliged to publish annually an explicit account of harbour receipts and expenditure, with the state of the debt. When this is done, public opinion will find a way of expressing itself, and point out the manner in which any surplus dues may be best employed for lighting and buoying purposes.

36. LANCASTER.

RIVER LUNE LIGHTHOUSE.—(SPECIAL RETURN.)

- I. River Lune, Lancaster.
- II. Commissioners and Trustees of the port of Lancaster.
- III. John Walker, Tonnage Office, Lancaster.

LANCASTER.

- IV. Two lights. One (No. 1) on Abbey Scar Rock, and one (No. 2) on the land about half a mile distant.
- V., VI. None.
- VII. As a guidance for vessels coming up the River Lune.
- VIII. 21st February 1848.
- IX. Charles Blades, jr., Lancaster, Builder. Per contract. John B. Hartley, Liverpool, Engineer.
- X. Harbour lights.
- XI. Stone lighthouse (No. 1) on the Abbey Scar. Solid masonry. Wood lighthouse (No. 2) on the land painted white.
- XII. Fitted with copper lightning conductors.
- XIII. No. 1, 59 feet; No. 2, 53 feet 9 inches.
- XIV. No. 1, 19 feet 6 inches elevation above high-water level. No. 2, 54 feet elevation above high-water level.
- XV. About nine miles.
- XVI. About 12 miles.
- XVII. E. N. E. to S. E. by E. (by Compass).
- XVIII. Fixed; white.
- XIX. Fixed.
- XX. From half flood to half ebb.
- XXI. Catoptric.
- XXII. Three in No. 1, and two in No. 2.
- XXIII. None.
- XXIV. A. and C. Seward, Lancaster.
- XXV. An iron pipe in each, through the roof.
- XXVI. None.
- XXVII. None.
- XXVIII. Eighteen days.
- XXIX. 2,898*l.* 7*s.* 10*d.*, exclusive of illuminating apparatus, lanterns, &c., and two guineas per annum for rent of site.
- XXX. Finished.
- XXXI. No. 1, 18 feet 6 inches by 7 feet } Cost - 708*l.* 10*s.*,
No. 2, 13 “ 9 “ by 7 “ } including illuminating apparatus.
- XXXII. Not purchased.
- XXXIII. Average annual cost of repairs for five years 26*l.* 18*s.* 7*d.*, and a sum of 697*l.* 4*s.* laid out in material for casing and strengthening No. 1, in 1856.
- XXXIV. No. 1 coated once in three years, and No. 2 every two years, cost included in the average, No. 33.
- XXXV. One keeper and son, 50*l.* 3*s.* 9*d.*, with a house, garden, &c.
- XXXVI. See No. 31.
- XXXVII. No. 1 and 2, 5*l.* 3*s.* 6*d.* for glass cylinders and cleaning stores.
- XXXVIII. 1857, 156 gallons, three gross of wicks; 1858, 158 gallons, three gross of wicks.
- XXXIX. Olive oil, 1857, at 5*s.* 6*d.* per gallon; olive oil, 1858, at 5*s.* 6*d.* per gallon.
- XL. Common round cotton wicks at 6*s.* 6*d.* per gross; total cost, 1857, 19*s.* 6*d.*; 1858, 19*s.* 6*d.*
- XLI. None.
- XLII., XLIII., XLIV. Included in Walney lighthouse account.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. The Commissioners and Trustees of the port of Lancaster.
- LI. Various times during the years by the Commissioners and Trustees of the port.
- LII. No.
- LIII. One spare lamp and burner for each lighthouse. Oil kept in a cask at the upper lighthouse.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. Not relieved.
- LVIII. To attend the lighthouses and keep in the same bright and clear lights during the night whilst there is rise of eight feet of water in the Channel throughout the year, and keeping the reflectors clean and lights properly trimmed.

In addition to the above harbour lights there is a small light on the pier head at Glasson Dock, for the guidance of vessels at night tide.

WALNEY LIGHTHOUSE.—(SPECIAL RETURN.)

Circular III.

- I. Walney Lighthouse on Walney Island.
- II. Commissioners and Trustees of the port of Lancaster.
- III. John Walker, Tonnage Office, Lancaster.
- IV. Lighthouse on the south end of Haws Point on Walney Island.

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<p>Circular III.</p> <p>V. 10th March 1789.</p> <p>VI. The Commissioners and Trustees of the port of Lancaster.</p> <p>VII. Recommended, on a survey in Lancaster Bay, by five of the Commissioners.</p> <p>VIII. 1st December 1790.</p> <p>IX. Joshua Britton, Mason. Per contract. E. Dawson, Whitehaven, for the plans.</p> <p>X. Sea light.</p> <p>XI. Stone. Outer wall coated with white paint and deck varnish.</p> <p>XII. No.</p> <p>XIII. Seventy-two feet.</p> <p>XIV. Seventy-one feet.</p> <p>XV. Thirteen miles.</p> <p>XVI. Twenty-two miles.</p> <p>XVIII. Revolving light; white.</p> <p>XIX. One minute.</p> <p>XX. Two seconds.</p> <p>XXI. Silver plated reflectors. Catoptric.</p> <p>XXII. Four burners.</p> <p>XXIII. Before 1846 the light showed once in five minutes, since 1846 it shows every minute. By the owners and masters of vessels and pilots.</p> <p>XXIV. In 1790 by W. and M. King, and renewed in 1846 by A. and C. Seward, Lancaster.</p> <p>XXV. Three copper ventilators in the roof.</p> <p>XXVI. No fog signals.</p> <p>XXVII. None used.</p> <p>XXVIII. Eighteen days.</p> <p>XXIX. 1,046<i>l</i>.</p> <p>XXX. Finished.</p> <p>XXXI. Height of lantern, 8 feet 4 inches; breadth, 11 feet.</p> <p>XXXII. Not purchased.</p> <p>XXXIII. Average for five years 1<i>l</i>. 1<i>s</i>. 10<i>d</i>. Not by contract.</p> <p>XXXIV. The stone work has only been coated three times at 5<i>l</i>. 6<i>s</i>. 3<i>d</i>. each time. Not by contract.</p> <p>XXXV. Two, 40<i>l</i>. and 30<i>l</i>., with a dwelling house, &c.</p> <p>XXXVI. Illuminating apparatus in 1846, 27<i>l</i>. 5<i>s</i>. 6<i>d</i>.</p> <p>XXXVII. In 1857, 7<i>l</i>. 8<i>s</i>., and 1858, 3<i>l</i>. 2<i>s</i>. 8<i>d</i>., exclusive of wear and tear.</p> <p>XXXVIII. 1857, 302 gallons; 1858, 303 gallons. 1857, 5½ gross of wicks; 1858, 5½ gross of wicks.</p> <p>XXXIX. Olive oil, 5<i>s</i>. 6<i>d</i>. per gallon.</p> <p>XL. Common round cotton wicks, 6<i>s</i>. 6<i>d</i>. per gross; total cost, 1857, 1<i>l</i>. 15<i>s</i>. 9<i>d</i>.; 1858, 1<i>l</i>. 15<i>s</i>. 9<i>d</i>.</p> <p>XLI. None.</p> <p>XLII. 3<i>d</i>. per register ton on vessels discharging within Lancaster Bay for the year, except the vessels discharging in the River Lane, and 1<i>d</i>. per ton on wind-bound vessels.</p> <p>XLIII. April to June. 1852, 148<i>l</i>. 16<i>s</i>. 10<i>d</i>.; April to June, 1858, 242<i>l</i>. 7<i>s</i>. 4<i>d</i>. Total income in 1852, 618<i>l</i>. 3<i>s</i>. 5<i>d</i>.</p> <p>XLIV. 1852, 333<i>l</i>. 10<i>s</i>. 4<i>d</i>.; 1858, 412<i>l</i>. 7<i>s</i>. 2<i>d</i>. See No. XXXIII, in Lune Lighthouse Return.</p> <p>XLV. None.</p> <p>XLVI. None.</p> <p>XLVII. None.</p> <p>XLVIII. None.</p> <p>XLIX. None.</p> <p>L. The Commissioners and Trustees of the port of Lancaster in 1857.</p> <p>LI. 18th June 1857.</p> <p>LII. No.</p> <p>LIII. One spare lamp and burner; the oil kept in a lead cistern within the lighthouse.</p> <p>LIV. Not any.</p> <p>LV. A red light is hoisted from half flood to half ebb in the night; no signals by day.</p> <p>LVI. None.</p> <p>LVII. Relieved immediately after the tidal light will allow it.</p> <p>LVIII. To light and constantly keep in the same bright and clear lights from the time of sunseting to sunrise throughout the year, and keeping the reflectors properly cleaned.</p> <p>The above replies refer to the Walney sea light, but the red light referred to in reply, No. 55, is a lantern, erected 1st October 1846, for the guidance of vessels entering Pile Harbour.</p>	<p>II. No income derived. Cost of maintenance in 1852, 25<i>l</i>. 9<i>s</i>. 2<i>d</i>.; 1858, 29<i>l</i>. 6<i>s</i>. 4<i>d</i>. Five sea buoys below the lighthouses; six above.</p> <p>III. No.</p> <p>IV. None.</p> <p>V. No. 1 in the chart 18 ft. 0in. in length by 9ft. 0in. diam.</p> <table border="0" style="width: 100%;"> <tr> <td style="width: 5%;">2</td> <td style="width: 15%;">do.</td> <td style="width: 15%;">9</td> <td style="width: 15%;">3</td> <td style="width: 15%;">do.</td> <td style="width: 15%;">5</td> <td style="width: 15%;">11</td> <td style="width: 15%;">do.</td> </tr> <tr> <td>3</td> <td>do.</td> <td>8</td> <td>6</td> <td>do.</td> <td>5</td> <td>9</td> <td>do.</td> </tr> <tr> <td>4</td> <td>do.</td> <td>7</td> <td>6</td> <td>do.</td> <td>4</td> <td>3</td> <td>do.</td> </tr> <tr> <td>5</td> <td>do.</td> <td>7</td> <td>0</td> <td>do.</td> <td>4</td> <td>2</td> <td>do.</td> </tr> </table> <p>a. Wood.</p> <p>b. According to size.</p> <p>c. 1<i>l</i>. 19. 2<i>d</i>.</p> <p>d. 8<i>s</i>. 10<i>d</i>.</p> <p>e. Five.</p> <p>f. Five.</p> <p>g. One at Glasson dock; four at Lancaster.</p> <p>h. With three sets of spare moorings.</p> <p>i. One.</p> <p>j. The chain broke.</p> <p>k. A chain with a square stone.</p> <p>l. 8<i>l</i>. 1<i>s</i>. 4<i>d</i>.</p> <p>m. Purchased by contract.</p> <p>n. They are numbered with white paint, 1, 2, 3, 4, 5.</p> <p>o. Five.</p> <p>VII. Yearly.</p> <p>VIII. Examined by the sea pilots.</p> <p>X. Landmark or beacon. Octagon and cone shape.</p> <p>a. Rossall landmark.</p> <p>b. Rebuilt in May 1847, and strengthened in 1858, in consequence of the beach upon which it stood washing away.</p> <p>c. For guidance into Lancaster Bay.</p> <p>d. Open timber erection, with a latticed open iron ball at the top.</p> <p>e. Wood secured with iron.</p> <p>f. Black, coated with gas tar.</p> <p>g. Not lighted.</p> <p>h. About 90 feet.</p> <p>i. Rebuilt in 1847, at a cost of 546<i>l</i>.</p> <p>j. 1852, 10<i>l</i>. 12<i>s</i>. 6<i>d</i>., and strengthened it 1858, 199<i>l</i>. 6<i>s</i>. 8<i>d</i>.</p> <p>k. None.</p> <p>XI. No alteration.</p> <p>XII. The deepest water is on the south side of all the buoys.</p> <p>XIV. The funds of the Commissioners of the port of Lancaster.</p> <p>XX. The same.</p> <p>XVI. No income.</p> <p>XVII. None.</p> <p>XVIII. None.</p> <p>XIX. The Commissioners and the pilots in May 1857 and May, 1858.</p> <p>XX. By the Commissioners of the port of Lancaster repeatedly in 1857 and 1858.</p> <p>XXI. Replaced as soon as possible.</p> <p>XXII. The pilots.</p> <p>XXIII. The pilots give the information.</p> <p>XXIV. No complaints.</p> <p>XXV. None.</p> <p>XXVI. None.</p> <p>XXVII. The beacon and buoys have hitherto been considered sufficient.</p>	2	do.	9	3	do.	5	11	do.	3	do.	8	6	do.	5	9	do.	4	do.	7	6	do.	4	3	do.	5	do.	7	0	do.	4	2	do.	<p>37. LLANELLY.*</p> <p>38. LITTLEHAMPTON.</p> <p>LIGHTHOUSE.—(SPECIAL RETURN.)</p> <p>I. Littlehampton.</p> <p>II. The Commissioners of the port of Arundel.</p> <p>III. Richard Holmes, Arundel, clerk to the said Commissioners.</p> <p>IV. One light.</p> <p>VI. By the Commissioners.</p> <p>VII. In order to assist vessels into and out of the harbour, and to enable vessels to bring up in the roads.</p> <p>IX. Built by the Commissioners.</p> <p>X. Both sea-light, and harbour-light.</p> <p>XI. Wood, white, with green top.</p> <p>XII. None.</p>	<p>Circular V.</p> <p style="text-align: center;">BUOYS AND BEACONS.</p> <p>I. The Commissioners and Trustees of the port of Lancaster.</p>
2	do.	9	3	do.	5	11	do.																												
3	do.	8	6	do.	5	9	do.																												
4	do.	7	6	do.	4	3	do.																												
5	do.	7	0	do.	4	2	do.																												

LITTLEHAMPTON.

- XIII. Thirty-two feet.
- XIV. Twenty-six feet.
- XV. Five miles.
- XVIII. Fixed red light.
- XIX. None.
- XX. From sunset to sunrise.
- XXI. Double parabola reflector.
- XXII. One argand.
- XXIII. None.
- XXIV. William Wilkins.
- XXV. Pipes in the top.
- XXVI. None.
- XXVIII. No register kept.
- XXIX. 58*l.* Is. 4*d.*
- XXX. Finished.
- XXXI. 50*l.*
- XXXII. Built by the Commissioners in the year 1848.
- XXXIII. 3*l.*
- XXXIV. 2*l.* 12*s.* Three coats.
- XXXV. No keeper, but under the superintendence of the harbour master.
- XXXVII. None.
- XXXVIII. The lighthouse burns gas.
- XXXIX. None.
- XL. None.
- XLI. None.
- XLII. The general fund belonging to the Commissioners.
- XLIII. No charge made.
- XLIV. No charge made for lighthouse.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. Master mariners generally are not satisfied with the red light, but would wish it to be a white light.
- L. Commissioners of the port.
- LII. No.
- LIII. None.
- LIV. None.
- LV. By tide gauge; by balls on flagstaff and yard by day, and lantern by night.
- LVI. By Marriott's signals by day; by night, none.
- LVIII. Lighted by gas.

The Commissioners have to explain, that they are much disappointed they are not allowed to show a white light instead of a red light. The light as a red light is only useful as a harbour light, whereas, if a white light was shown, it would be visible at least double the distance it is now, and enable vessels to bring up in the roads with more certainty than they can now. The Trinity Board refused to allow a white light.

This light was observed on the night of the 5th of July 1859, from the "Vivid." According to the Lighthouse Chart and the Admiralty list it should be seen at about 7 miles. It could hardly be seen at 4½. The night was remarkably fine. The Owers floating light was seen distinctly at about 9½ miles. Beachy Head shore light, which should be seen at 22 miles, was seen at 25, and the town lights at Brighton and Shoreham were also seen. The light at Little Hampton stands No. 5 on the list of lights visited or seen afloat, and from this observation seems to be inferior to neighbouring lights.

On the 23d of August the lighthouse was visited by Dr. Gladstone. The gas burner is an Argand. The flame was tall, not showing much body of light. The reflector is a "Sideral," and consists of two parabolic conical reflectors one above and the other below the light.

It was evident that a very large portion of the light was lost. It shows red towards the sea, white through three little windows, one showing up the river, the other two along the beach, right and left. There is but one keeper, who is paid 16*s.* per week. He has to work in the gasworks by day, to attend to the lighthouse, and is expected to look at the light every two hours from his cottage, which is very near. He has been there 15 months, and states that he has never broken a glass chimney, nor has the gas ever gone out or flickered from water in the pipes. The lighthouse has a main from the gasworks for itself, and should water ever get into the pipe there are means of pumping it out. The lighthouse was dirty. No books are kept. The gasmeter is in the lighthouse. The panes of red glass were observed to be

LITTLEHAMPTON.

extremely different from one another in colour; and the keeper said that the sun fades them unequally. Observations by Commissioners. It was stated that this light does not serve as a leading light into the harbour; vessels lie off beyond the bar all night.

BUOYS AND BEACONS.

There are no buoys and beacons; the channel of the river is defined by the piers and river banks. Circular V.

LLOYD'S EVIDENCE.

- I. George Corney, shipowner, Littlehampton. Circular VI.]
- II. LITTLEHAMPTON.
- III. Commissioners of the Port.
- IV. I frequently hear complaints of the light not being sufficiently strong to be seen at a proper distance.
- V. Nil.
- VI. Nil.
- VII. Fixed light, gas; the leading lights are oil.
- VIII. Nil.
- IX. Nil.
- X. Nil.
- XI. Lanthorns light with oil.
- XII. Nil.
- XIII. Nil.
- XIV. Nil.
- XV. Nil.
- XVI. Nil.
- XVII. Not sufficiently strong.
- XVIII. Nil.
- XIX. Nil.
- XX. Only as before stated.

- I. George Robinson, shipowner, Littlehampton. Circular VI.
- II. LITTLEHAMPTON.
- III. Commissioners of the Port and Harbour Master.
- IV. The harbour light is red, but not to be seen far enough.

- V. Nil.
- VI. Nil.
- VII. Stationary light, gas; tidal lanthorns, oil.
- VIII. Nil.
- IX. Nil.
- X. Nil.
- XI. Lanthorns used as leading lights when ships come in in the night.

- XII. Nil.
- XIII. Nil.
- XIV. Nil.
- XV. Nil.
- XVI. Nil.
- XVII. Defective light.
- XVIII. Nil.
- XIX. Nil.
- XX. None other, except above named.

- I. Thomas Howard, shipowner, Littlehampton. Circular VI.
- II. LITTLEHAMPTON, PORT of ARUNDEL.
- III. Local Commissioners and their Harbour Master.
- IV. We have a red light at the East pier end, but the general complaint is, it cannot be seen by mariners at a sufficient distance.

- V. Nil.
- VI. Nil.
- VII. Stationary light, gas; tidal lanthorns, oil.
- VIII. Nil.
- IX. Nil.
- X. Nil.
- XI. Tide lanthorns, for leading lights used when required.
- XII. Nil.
- XIII. Nil.
- XIV. Nil.
- XV. Nil.
- XVI. Nil.
- XVII. Defective light.
- XVIII. Nil.
- XIX. Nil.
- XX. None other except above mentioned.

LIVERPOOL.
Circular II.

39. LIVERPOOL.

LIGHTHOUSES.—(GENERAL RETURN.)

- I. Mersey Docks and Harbour Board, Liverpool.
- II. 1. Point Lynas. 2. Upper Hoylake. 3. Lower Hoylake. 4. Leasowe. 5. Bidston. 6. Rock Lighthouse. 7. Crosby. 8. Formby (disused.) A chart of Liverpool to Holyhead, including the above named, accompanies this return; the special returns required were furnished in July last.
- III. Sites have been selected in accordance with the particular design in view, viz., for a warning light, as Point Lynas, a bold projecting headland is chosen; the other lights constituting leading lights, their position are necessarily restricted to the line they are intended to indicate.
- IV. The elevation of the lights under the control of the Board is not sufficient to have brought this question under consideration.
- V. Catoptric only.
- VI. The catoptric principle was chosen before the dioptric principle was brought into use.
- VII. Point Lynas, flashing; Rock Lighthouse, revolving; all others fixed.
- VIII. The necessity of distinguishing neighbouring lights from each other governed the selection of the illuminating apparatus in each case; all are of the natural color, except Crosby, which is red, and Rock Lighthouse, which is red on one face.
- IX. The ordinary parabolic reflector and fountain lamp, with argand burner, is the only one in use, the colored lights being affected by tinted glass chimnies.
- X. Filled up.
- XI. Stores are purchased by the officials of the establishment, or by open contract, as at the time may appear to the Board to be most expedient, and are subject to such various tests as may apply to the article under question.
- XII. Fog signals can be conveyed only by sound. Rock Lighthouse only is supplied with fog signals, bells are then used (vide special return), none others of the lighthouses are in a position to use fog signals effectively.
- XIII. No general code is in force. Tide signals, consisting of a ball by day and a light by night, are exhibited only from Rock Lighthouse. The principle upon which those were chosen is supposed to be that of making them visible to an observer, and the selection of the lighthouse was probably governed by its site below high-water mark, affording facilities for observing the tide, and by its position at the turning point to and from a channel nearly dry at low water.
- XIV. Unknown.
- XV. The obligations imposed upon the board by the several successive Acts of Parliament, under which light dues are levied, entail the maintenance of other establishments, than the lighthouses themselves; the purposes to which the light dues are applied being as follows:—1. Maintenance of lighthouses. 2. Line of telegraph to Holyhead. 3. Lifeboat establishment. 4. Buoying and beaconage of the port. 5. Conservancy of the Mersey. The income from light dues cannot therefore be justly compared with the expenditure on the first-named object alone. The following is a statement of income from light dues, and expenditure on lighthouses, as requested:—

Light Dues Income.

1846	1847	1848	1849	1850	1851	1852
8,733 <i>l.</i>	9,712 <i>l.</i>	9,274 <i>l.</i>	10,411 <i>l.</i>	10,066 <i>l.</i>	10,909 <i>l.</i>	11,543 <i>l.</i>
1853	1854	1855	1856	1857	1858	1859
11,461 <i>l.</i>	12,937 <i>l.</i>	12,052 <i>l.</i>	13,203 <i>l.</i>	14,077 <i>l.</i>	13,323 <i>l.</i>	13,479 <i>l.</i>

Lighthouse Expenditure.

1846	1847	1848	1849	1850	1851	1852
2,230 <i>l.</i>	2,100 <i>l.</i>	3,572 <i>l.</i>	2,111 <i>l.</i>	1,902 <i>l.</i>	1,957 <i>l.</i>	1,560 <i>l.</i>
1853	1854	1855	1856	1857	1858	1859
1,729 <i>l.</i>	2,068 <i>l.</i>	2,334 <i>l.</i>	1,875 <i>l.</i>	1,909 <i>l.</i>	2,108 <i>l.</i>	1,902 <i>l.</i>

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XVI. Such improvements are submitted to the officers of the particular department to which they apply, and one experimented on or not, as may seem expedient, and results are reported to the superior authority for consideration.

XVII. Nil.

XVIII. Copies have already been furnished.

XIX. The expenditure given in answer to No. XV., include only wages of keepers, repairs, and stores, and do not include any charge for superintendence, but simply expenses attached to the lighthouses themselves.

TABLE OF PRICES.

POINT LYNAS.—Catoptric. 13 burners.

Price	-	-	-	Flashing.	85 <i>l.</i> 12 <i>s.</i>
Ordinary repairs	-	-	-		60 <i>l.</i>
Oil	-	{	Consumption	-	13·3 gallons and decimal parts.
		{	Cost	-	2 <i>l.</i> 4 <i>s.</i> 3 <i>d.</i>
Wicks	-	{	Consumption	-	17 in No.
		{	Cost	-	Two pence nearly.

UPPER HOYLAKE.—Catoptric. 2 burners.

Price	-	-	-	Fixed.	94 <i>l.</i> 10 <i>s.</i>
Ordinary repairs	-	-	-		50 <i>l.</i>
Oil	-	{	Consumption	-	4·2 gallons and decimal parts.
		{	Cost	-	14 <i>s.</i>
Wicks	-	{	Consumption	-	8 in No.
		{	Cost	-	One penny nearly.

LOWER HOYLAKE.—Catoptric. 3 burners.

Price	-	-	-	Fixed.	12 <i>l.</i> 15 <i>s.</i>
Ordinary repairs	-	-	-		50 <i>l.</i>
Oil	-	{	Consumption	-	5·2 gallons and decimal parts.
		{	Cost	-	17 <i>s.</i>
Wicks	-	{	Consumption	-	11 in No.
		{	Cost	-	One penny farthing nearly.

LEASOWE.—Catoptric. 8 burners.

Price	-	-	-	Fixed.	234 <i>l.</i> 2 <i>s.</i>
Ordinary repairs	-	-	-		100 <i>l.</i>
Oil	-	{	Consumption	-	8·5 gallons and decimal parts.
		{	Cost	-	1 <i>l.</i> 8 <i>s.</i> 3 <i>d.</i>
Wicks	-	{	Consumption	-	14 in No.
		{	Cost	-	One penny farthing nearly.

BIDSTON.—Catoptric. 11 burners.

Price	-	-	-	Fixed.	311 <i>l.</i> 12 <i>s.</i>
Ordinary repairs	-	-	-		80 <i>l.</i>
Oil	-	{	Consumption	-	12 gallons.
		{	Cost	-	2 <i>l.</i>
Wicks	-	{	Consumption	-	36 in No.
		{	Cost	-	Fourpence.

ROCK LIGHTHOUSE.—Catoptric. 24 burners.

Price	-	-	-	Revolving.	708 <i>l.</i> 16 <i>s.</i>
Ordinary repairs	-	-	-		40 <i>l.</i>
Oil	-	{	Consumption	-	22 gallons.
		{	Cost	-	3 <i>l.</i> 13 <i>s.</i> 4 <i>d.</i>
Wicks	-	{	Consumption	-	49 in No.
		{	Cost	-	Fivepence nearly.

CROSBY.—Catoptric. 10 burners.

Price	-	-	-		289 <i>l.</i> 14 <i>s.</i>
Ordinary repairs	-	-	-		100 <i>l.</i>
Oil	-	{	Consumption	-	8·3 gallons and decimal parts.
		{	Cost	-	1 <i>l.</i> 7 <i>s.</i> 7 <i>d.</i>
Wicks	-	{	Consumption	-	12 in No.
		{	Cost	-	One penny farthing nearly.

ROCK LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Rock Lighthouse. Near New Brighton, Cheshire.
- II. Mersey Docks and Harbour Board, Liverpool.
- III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Offices, Liverpool.
- IV. Single light.
- V. The site of the existing lighthouse was occupied by a timber beacon since the year 1680. The date of the first application for the substitution of a lighthouse is unknown.
- VI. Unknown.
- VII. The lighthouse stands upon a half-tide rock projecting into the river, and which forms the elbow or turning point from the Rock Channel into the Mersey.

POOL.
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- VIII. 1830.
 IX. Builder unknown. Architect, John Foster. No contract.
 X. Sea-light.
 XI. Welsh limestone. Solid. Not coated.
 XII. Iron rod surmounted by a knob with projecting spikes.
 XIII. Ninety-four feet.
 XIV. Sixty-one feet.
 XV. Eight and three quarter miles.
 XVI. Thirteen and three quarter miles.
 XVII. Three hundred and sixty degrees.
 XVIII. Revolving, alternating; twice of the natural colour; once red.
 XIX. The three successive appearances complete one revolution, and occupy three minutes. The duration of each appearance depends in a measure upon the distance of the observer; when near, the interval of darkness is momentary, and increases as the distance absorbs the fainter rays.
 XX. Sunset to sunrise throughout the year.
 XXI. Catoptric.
 XXII. Twenty-four.
 XXIII. Nil.
 XXIV. De Ville and Co., London. Lamps and reflectors have been made at different times by different parties. The name given is that of the maker most recently employed.
 XXV. Chimney in the roof.
 XXVI. Three bells are tolled by the same machinery that causes the light to revolve.
 XXVII. { Twenty-five }
 XXVIII. { days } - { These represent all occasions of fog whether of long or short duration; the average duration equals 4 hours 36 minutes; total fogs equal a period of 115 hours, or 4½ days. }
 XXIX. 27,609l.
 XXX. Finished in 1830.
 XXXI. Diameter 12 feet; height of window 8 feet; conical roof 6 feet 6 inches.
 XXXII. Vide XXIX, and VIII.
 XXXIII. 50l. Either by mechanics attached to the establishment of the Board, by workmen engaged on the spot, or by contract, as at the time may be found expedient.
 XXXIV. Painting, colouring interior, 5l. per annum. No contract. Exterior does not require coating.
 XXXV. One keeper at 90l. per annum, and two assistants at 80l. per annum each
 XXXVI. Glass cylinders - - - £8 16 0
 24 reflectors - - - - - 540 0 0
 24 lamps - - - - - 50 0 0
 Revolving machinery - - - 50 0 0
 Standard fittings, &c., estimated 20 0 0
 Total - - - - - £708 16 0
 (Cost of transport cannot be given.)
 XXXVII. 23l. 14s. 6d. in 1857; 28l. 10s. in 1858. It being usually understood that "wear and tear" is represented by repairs, no additional amount for that item is here included. Of course reflectors, &c. deteriorate, but it would be very difficult to estimate the precise value of such deterioration.
 XXXVIII. Oil, 961 gallons in 1857; 959 gallons in 1858. Wicks, 2,269 in 1857; 2,258 in 1857.
 XXXIX. Best refined olive oil, 5s. 2d. per gallon, in 1857; 4s. 1d. per gallon in 1858.
 XL. Cotton Argand wicks at 1s. 4d. per gross. Cost, 21s. in 1857; 21s. in 1858.
 XLI. Three bells, hammers, &c. Estimated at 75l.
 XLII. Lighthouse dues, levied by the Mersey Docks and Harbour Board. Paid at the Dock Offices.
 XLIII. The dues being levied as a whole, the proportion due for each lighthouse cannot be distinguished; the whole is therefore given:—Midsummer quarter, 1852, 3,340l. 4s. 5d.; 1858, 3,679l. 1s. 1d.; total income, 1852, 11,543l. 14s. 10d.
 XLIV. The expenditure for each lighthouse can be distinguished and is here given for this lighthouse:—406l. 15s. 7d. in 1852; 493l. 9s. 10d. in 1858.
 XLV. Nil.
 XLVI. Nil.
 XLVII. Nil.
 XLVIII. Nil.
 XLIX. Nil.
 L. By local authorities under the Mersey Docks and Harbour.
 LI. Inspections monthly.

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- LII. Never.
 LIII. A spare burner to every lamp. Half a set of spare lamps. Oil stored in an oil room fitted for the purpose.
 LIV. Barometer and thermometer.
 LV. By day a ball is hoisted and exhibited while there is more than 11 feet of water through the rock gut; by night the same is indicated by the exhibition of a fixed light from the same tower beneath the revolving light, visible only in the river and Rock Channel.
 LVI. Marrayt's signals.
 LVII. Two are always on duty in the building, of whom one is always on watch. One is relieved to the shore every second day.
 LVIII. A copy accompanies these returns.

This lighthouse was visited on the 14th of July. Observations by Commissioners. There are three keepers, one at 90l., two at 80l.

The house was dirty. The lantern roof thickly covered with soot from a defect in a chimney which passes through the lantern. There are 22 reflectors, ten with lamps having red chimneys on one side, and 6 on each of two other sides, with chimneys of clear glass. There are three fog bells, rung by machinery.

The light was observed on the 13th of July. It was not lit at 8.45, when passed by the "Vivid," though the sun had set some time before the vessel entered the river. It was not seen till about 9 p.m. on the 15th, when it was again observed from a distance. It appeared to be a good light. It stands 36 on the list of lights visited or seen afloat.

CROSBY LIGHTHOUSE.—(SPECIAL RETURN.) Circular III.

- I. Crosby Lighthouse. On the shore among the sand hills, near the entrance of the River Alt, between Crosby and Formby, Lancashire.
 II. Mersey Docks and Harbour Board, Liverpool.
 III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Office, Liverpool.
 IV. Single light.
 V. 1839.
 VI. Captain Denham, R.N., Marine Surveyor.
 VII. Designed, with the Formby Lightship, to lead through the Victoria Channel. The alterations which subsequently occurred in this channel led to this lighthouse being removed, and another built 1,100 yards to the northward.
 VIII. The light was exhibited from the original lighthouse 10th October 1839, and was transferred to the present building 2d November 1847.
 IX. Jesse Hartley, Engineer and Builder.
 X. Sea-light.
 XI. Brick. Square tapered tower. Whitewashed.
 XII. Iron rod surmounted with a knob, with projecting iron spikes.
 XIII. Eighty-one and a half feet.
 XIV. Ninety feet.
 XV. Ten and three quarter miles.
 XVI. Fifteen and a quarter miles.
 XVII. Is masked on bearings from the lighthouse W. to N.N.W. ½ W., and ranges to the north-westward over the intermediate segment of the horizon 63 degrees.
 XVIII. Fixed. Red.
 XIX. Nil.
 XX. Sunset to sunrise throughout the year.
 XXI. Catoptric.
 XXII. Ten.
 XXIII. Nil.
 XXIV. De Ville and Co., Strand, London. Lamps and reflectors have been made at different times by different parties. The name given is that of the maker most recently employed.
 XXV. Chimney in the roof.
 XXVI. Nil.
 XXVII. Nil.
 XXVIII. Nil.
 XXIX. 1,239l. 11s. 11d. Site not included.
 XXX. Finished.
 XXXI. The term lantern does not strictly apply. The light-room constitutes the upper floor of the tower, and is an apartment 11 feet square, with one side glazed with plate glass 5 feet 6 inches in height. The dimensions of the apartment are such that no special arrangements for ventilation are required.

LIVERPOOL.
Circular III.

LIVERPOOL.	LIVERPOOL.	LIVERPOOL.	LIVERPOOL.
<p>XXXII. Vide XXIX.</p> <p>Circular III. XXXIII. Year 1857, 90<i>l</i>. After the building having been discontinued as a lighthouse for several years, it was this year again brought into use. Repairs are effected by mechanics attached to the establishment of the Board, by workmen engaged on the spot, or by contract, as at the time may be found most expedient.</p> <p>XXXIV. Papered, painted, and coloured every three years, at a cost of 40<i>l</i>. Exterior whitewashed.</p> <p>XXXV. One keeper at 84<i>l</i>. per annum, who is required to provide proper assistance.</p> <p>XXXVI. Glass cylinders - - - - £ 7 4 0 10 reflectors - - - - - 225 0 0 10 lamps - - - - - 37 10 0 Standard fittings, &c., estimated 20 0 0</p> <p style="text-align: right;">Total - - - - - £289 14 0</p> <p>(Cost of transport cannot be given.)</p> <p>XXXVII. 11<i>l</i>. 13<i>s</i>. 6<i>d</i>. in 1857; 6<i>l</i>. 4<i>s</i>. 6<i>d</i>. in 1858. It being generally understood that "wear and tear" is represented by repairs, no additional amount for that item is here included. Of course reflectors, &c. deteriorate, but it would be very difficult to estimate the precise value of such deterioration.</p> <p>XXXVIII. Oil, 374 gallons in 1857; 389 gallons in 1858. Wicks, 524 in 1857; 550 in 1858.</p> <p>XXXIX. Best refined olive oil, 5<i>s</i>. 2<i>d</i>. per gallon in 1857; 4<i>s</i>. 1<i>d</i>. per gallon in 1858.</p> <p>XL. Cotton Argand wicks at 1<i>s</i>. 4<i>d</i>. per gross. Cost, 4<i>s</i>. 9½<i>d</i>. in 1857; 5<i>s</i>. 1<i>d</i>. in 1858.</p> <p>XLI. Nil.</p> <p>XLII. Lighthouse dues are levied by the Mersey Docks and Harbour Board. Paid at the Dock Offices.</p> <p>XLIII. The dues being levied as a whole, the proportion due for each lighthouse cannot be distinguished, the whole is therefore given:—Midsummer quarter, 1852, 3,340<i>l</i>. 4<i>s</i>. 5<i>d</i>.; 1858, 3,679<i>l</i>. 1<i>s</i>. 1<i>d</i>.; total income, 1852, 11,543<i>l</i>. 14<i>s</i>. 10<i>d</i>.</p> <p>XLIV. The expenditure for each lighthouse can be distinguished, and is here given for this lighthouse:—1852, not in use; 1858, 263<i>l</i>. 1<i>s</i>. 1<i>d</i>.</p> <p>XLV. Nil.</p> <p>XLVI. Nil.</p> <p>XLVII. Nil.</p> <p>XLVIII. Nil.</p> <p>XLIX. Nil.</p> <p>L. By local authorities under the Mersey Docks and Harbour Board.</p> <p>LI. Monthly.</p> <p>LII. Never.</p> <p>LIII. A spare burner to every lamp. Half a set of spare lamps. Oil stored in an oilroom fitted for the purpose.</p> <p>LIV. None.</p> <p>LV. None. Could serve no useful purpose here.</p> <p>LVI. None; except for directing the lifeboat to vessels in distress.</p> <p>LVII. Keeper resides in the building.</p> <p>LVIII. A printed copy accompanies these returns.</p> <p>N.B.—In the immediate neighbourhood of this lighthouse exists another called Formby Lighthouse, which, being for the present disused, does not appear on an existing lighthouse in these returns. Since 1833 it has been twice in use for periods of five years each time, alternating with the former and present Crosby lighthouses, as changes in the direction of the sea channels rendered necessary changes in the line of the leading lights. Formby Lighthouse was built about 1718; a circular brick tower, 120 feet high, and was designed for a landmark, but in 1833 was converted into a lighthouse. It is now maintained by a care taker in good order, but without illuminating apparatus.</p> <p>This light was observed on the night of the 15th of July 1859 from the "Vivid." It seemed to be a good light, but the red colour was not very marked. It was first seen at 9 p.m. instead of at sunset (8-9 p.m. at Greenwich). It stands 37 on the list of lights visited or seen alight.</p> <p>Circular III. LEASOWE LIGHTHOUSE.—(SPECIAL RETURN.)</p> <p>I. Leasowe. Coast of Cheshire, nearly midway between the Mersey and the Dee estuaries.</p> <p>II. Mersey Docks and Harbour Board, Liverpool.</p> <p>III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Office, Liverpool.</p>	<p>IV. Single light.</p> <p>V. Vide Act 2nd Geo. III. cap. 86., A.D. 1761.</p> <p>VI. The act above referred to was promoted by the Trustees of the Liverpool Docks, established under the authority of former Acts of Parliament.</p> <p>VII. Originally the present lighthouse was the inner of two lighthouses designed to form a leading line through the Horse Channel.</p> <p>VIII. 1763.</p> <p>IX. Unknown.</p> <p>X. Sea-light.</p> <p>XI. Circular tapered tower, built of brick walls, believed to be solid. Painted white outside.</p> <p>XII. Iron rod lightning conductor, surmounted by a knob from which several points project.</p> <p>XIII. One hundred and ten feet.</p> <p>XIV. Ninety-four feet.</p> <p>XV. Eleven miles.</p> <p>XVI. Sixteen miles.</p> <p>XVII. Is masked in a direction from the lighthouse, bearing N.E. ¾ N. magnetic, and ranges from that round by the northward and westward, about 125 degrees, when it meets the coast line on a W. by S. bearing.</p> <p>XVIII. Fixed; of the natural colour.</p> <p>XIX. Nil.</p> <p>XX. Sunset to sunrise throughout the year.</p> <p>XXI. Catoptric.</p> <p>XXII. Eight.</p> <p>XXIII. Nil.</p> <p>XXIV. De Ville and Co., Strand, London. Lamps and reflectors have been made at different times by different parties. The name given is that of the maker most recently employed.</p> <p>XXV. Chimney in the roof.</p> <p>XXVI. Nil.</p> <p>XXVII. Nil.</p> <p>XXVIII. Nil.</p> <p>XXIX. Cannot be given. Vide V., VI., VIII., and IX.</p> <p>XXX. Vide V., VI., VIII., and IX.</p> <p>XXXI. The tern lantern does not strictly apply to the light-room, which constitutes the upper floor of the building. It is an apartment nearly circular, 14 feet diameter, a segment of its circumference forming a glazed window 12 feet broad, 8 feet high; the apartment itself being nearly 14 feet high. The dimensions of the apartment renders special ventilating apparatus unnecessary. The lightroom being an integral part of the building, its cost cannot be distinguished.</p> <p>XXXIII. 85<i>l</i>.; either by mechanics attached to the establishment of the board, by workmen engaged on the spot, or by contract, as at the time may be found most expedient.</p> <p>XXXIV. Painted interior and exterior, coloured, and papered, every three years, by open tender. Last contract 78<i>l</i>.</p> <p>XXXV. One keeper at 60<i>l</i>. per annum, who is required to provide an assistant.</p> <p>XXXVI. Glass cylinders - - - - £ 1 12 0 8 Reflectors - - - - - 180 0 0 8 Lamps - - - - - 32 10 0 Standard fittings, &c., estimated 20 0 0</p> <p style="text-align: right;">Total - - - - - £234 2 0</p> <p>(Cost of transport cannot be given.)</p> <p>XXXVII. 5<i>l</i>. 11<i>s</i>. in 1857; 5<i>l</i>. 10<i>s</i>. in 1858. It being usually understood that wear and tear is represented by repairs, no additional amount for that item is here included. Of course reflectors, &c. deteriorate, but it would be very difficult to estimate the precise value of such deterioration.</p> <p>XXXVIII. Oil, 373 gallons in 1857; 372 gallons in 1858. Wicks, 616 in 1857; 702 in 1858.</p> <p>XXXIX. Best refined olive oil, price 5<i>s</i>. 2<i>d</i>. per gallon in 1857; 4<i>s</i>. 1<i>d</i>. per gallon in 1858.</p> <p>XL. Cotton Argand wicks, 1<i>s</i>. 4<i>d</i>. per gross; cost 5<i>s</i>. 8½<i>d</i>. in 1857; 6<i>s</i>. 6½<i>d</i>. in 1858.</p> <p>XLI. Nil.</p> <p>XLII. Lighthouse dues levied by the Mersey Docks and Harbour Board; paid at the Dock Offices.</p> <p>XLIII. The dues being levied as a whole, the proportion due for a particular lighthouse cannot be distinguished. The amounts levied for the whole are given. Midsummer quarter 1852, 3,460<i>l</i>. 4<i>s</i>. 5<i>d</i>.; 1858, 3,679<i>l</i>. 1<i>s</i>. 1<i>d</i>.; total income 1852, 11,543<i>l</i>. 14<i>s</i>. 10<i>d</i>.</p> <p>XLIV. The expenditure for each lighthouse can be distinguished, and is given for this lighthouse, 1852, 238<i>l</i>. 12<i>s</i>. 2<i>d</i>.; 1858, 304<i>l</i>. 1<i>s</i>. 6<i>d</i>.</p>	<p>LIVERPOOL.</p> <p>LIVERPOOL.</p>	<p>LIVERPOOL.</p> <p>LIVERPOOL.</p>

<p>LIVERPOOL.</p> <p>XXXV. One keeper at 55<i>l.</i> per annum, who is required to provide proper assistance.</p> <p>XXXVI. Glass cylinders - - - - £ 0 15 0 3 Reflectors - - - - - 89 0 0 3 Lamps - - - - - 20 0 0 Standard fittings, &c., estimated 12 0 0</p> <p style="text-align: right;">£212 15 0</p> <p>(Cost of transport cannot be given.)</p> <p>XXXVII. <i>3<i>l.</i> 5<i>s.</i> 6<i>d.</i></i> in 1857; <i>2<i>l.</i> 15<i>s.</i></i> in 1858. It being usually understood that "wear and tear" is represented by repairs, no additional amount is here included for that item. Of course reflectors, &c. deteriorate, but it would be very difficult to estimate the precise value of such deterioration.</p> <p>XXXVIII. Oil, 217 gallons in 1857; 227 gallons in 1858. Wicks, 482 in 1857; 492 in 1858.</p> <p>XXXIX. Best refined olive oil, <i>5<i>s.</i> 2<i>d.</i></i> per gallon in 1857; <i>4<i>s.</i> 1<i>d.</i></i> per gallon in 1858.</p> <p>XL. Cotton Argand wicks, <i>1<i>s.</i> 4<i>d.</i></i> per gross; <i>4<i>s.</i> 4½<i>d.</i></i> in 1857; <i>4<i>s.</i> 5<i>d.</i></i> in 1858.</p> <p>XLII. Nil.</p> <p>XLIII. Lighthouse dues levied by the Mersey Docks and Harbour Board; paid at the Dock Offices.</p> <p>XLIII. The dues being levied as a whole, the proportion due for each lighthouse cannot be distinguished; the whole is therefore given. Midsummer quarter 1852, <i>3,340<i>l.</i> 4<i>s.</i> 5<i>d.</i></i>, 1858, <i>3,679<i>l.</i> 1<i>s.</i> 1<i>d.</i></i>; total income, 1852, <i>11,543<i>l.</i> 14<i>s.</i> 10<i>d.</i></i></p> <p>XLIV. The expenditure for each lighthouse can be distinguished, and is here given for this lighthouse, 1852, <i>136<i>l.</i> 9<i>s.</i></i>; 1858, <i>141<i>l.</i> 9<i>s.</i> 4<i>d.</i></i></p> <p>XLV. Nil.</p> <p>XLVI. Nil.</p> <p>XLVII. Nil.</p> <p>XLVIII. Nil.</p> <p>XLIX. Nil.</p> <p>L. By local authorities under the Mersey Docks and Harbour Board.</p> <p>LI. Monthly.</p> <p>LII. Never.</p> <p>LIII. A spare burner to every lamp; half a set of spare lamps; oil stored in the lightroom.</p> <p>LIV. None.</p> <p>LV. None; could not here serve any useful purpose.</p> <p>LVI. A separate telegraph establishment is maintained under the same authorities as the lighthouse.</p> <p>LVII. Keepers reside in the building.</p> <p>LVIII. A copy accompanies these returns.</p>	<p>LIVERPOOL.</p> <p>XLV. Nil.</p> <p>XLVI. Nil.</p> <p>XLVII. Nil.</p> <p>XLVIII. Nil.</p> <p>XLIX. Nil.</p> <p>L. By local authorities under the Mersey Docks and Harbour Board.</p> <p>LI. Inspections monthly.</p> <p>LII. Never.</p> <p>LIII. A spare burner to every lamp. Half a set of spare lamps. Oil stored in an oilroom, in the basement of the building.</p> <p>LIV. None.</p> <p>LV. None are used, because they could be of no service.</p> <p>LVI. Only signals indicating vessels in distress. For other purposes a separate telegraphic establishment is maintained under the same authorities as the lighthouse.</p> <p>LVII. Keepers reside in the building.</p> <p>LVIII. A printed copy accompanies these returns.</p>
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This light was observed from the "Vivid" on the night of the 15th of July 1859. It was first seen about 9 p.m. It stands 38 on the list of lights visited or seen alight.

LOWER HOYLAKE LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Lower Hoylake, Hoylake, Cheshire.
- II. Mersey Docks and Harbour Board, Liverpool.
- III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Offices, Liverpool.
- IV. Lower Hoylake Lighthouse is the lower or seaward of two lighthouses, bearing N.E. by N. and S.W. by S., 400 yards distant from each other. (Vide Return for Upper Hoylake.)
- V. Vide Act 2 Geo. III. cap. 86, A.D. 1761.
- VI. The Act above referred to was promoted by the trustees of the Liverpool Docks, established under the authority of former Acts of Parliament.
- VII. Originally designed to lead into Hoylake Anchorage, and to mark the elbow of Horse and Rock Channels.
- VIII. 1763.
- IX. Unknown.
- X. Sea-light.
- XI. Brick; semi-circular end to a building painted white. Walls believed to be solid.
- XII. Iron rod, surmounted by a knob with projecting spikes.
- XIII. Forty-one feet.
- XIV. Thirty-one feet.
- XV. Six and a quarter miles.
- XVI. Eleven miles.
- XVII. Is masked in a direction from the lighthouse, bearing N. by W. ¼ W., and ranges from that round by the north and eastward, about 100 degrees, until lost upon the shore.
- XVIII. Fixed light of the natural colour.
- XIX. Nil.
- XX. Sunset to sunrise throughout the year.
- XXI. Catoptric.
- XXII. Three.
- XXIII. Nil.
- XXIV. De Ville and Co., London. Lamps and reflectors have been made at different times by different parties. The name given is that of the maker most recently employed.
- XXV. Chimney in the roof.
- XXVI. Nil.
- XXVII. Nil.
- XXVIII. Nil.
- XXIX. Unknown.
- XXX. Finished in 1763.
- XXXI. The term lantern does not strictly apply. The lightroom is the upper floor of the lighthouse, a capacious apartment, forming storeroom, &c. One side of the apartment is glazed for the exhibition of the light. No special arrangements are required for ventilation. The cost of the lightroom cannot be given.
- XXXII. Vide V., VI., VIII., and IX.
- XXXIII. *55*l.**; either by mechanics attached to the establishment of the board, by workmen on the spot, or by contract, as at the time may be found expedient.
- XXXIV. Painted, coloured, and papered every three years by open tender. The last contract *20*l.**; exterior whitewashed.

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- XLV. Nil.
 - XLVI. Nil.
 - XLVII. Nil.
 - XLVIII. Nil.
 - XLIX. Nil.
 - L. By local authorities under the Mersey Docks and Harbour Board.
 - LI. Monthly.
 - LII. Never.
 - LIII. A spare burner to every lamp; half a set of spare lamps; oil stored in the lightroom.
 - LIV. None.
 - LV. None; could not here serve any useful purpose.
 - LVI. A separate telegraph establishment is maintained under the same authorities as the lighthouse.
 - LVII. Keepers reside in the building.
 - LVIII. A copy accompanies these returns.
- This light was observed from the "Vivid" on the night of the 15th of July 1859. It was first seen at about 9 p.m. It stands 39 on the list of lights visited or seen alight.

UPPER HOYLAKE LIGHTHOUSE.—(SPECIAL RETURN.) Circular III.

- I. Upper Hoylake, Hoylake, Cheshire.
- II. Mersey Docks and Harbour Board, Liverpool.
- III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Office.
- IV. Upper Hoylake Lighthouse is the inner of two lighthouses, bearing N. E. by N. and S. W. by S., 400 yards distant from each other. (Vide Return for Lower Hoylake.)
- V. Vide Act 2 Geo. III. cap. 86, A.D. 1761.
- VI. The Act above referred to was promoted by the trustees of the Liverpool Docks, established under the authority of former acts of Parliament.
- VII. Originally designed to lead into Hoylake anchorage and to mark the elbow of the Horse and Rock channels.
- VIII. 1763.
- IX. Unknown.
- X. Sea light.
- XI. Circular brick tower, tapered to the summit. Walls believed to be solid. Painted white.
- XII. Iron rod surmounted by a knob with projecting iron spikes.
- XIII. 64 feet.
- XIV. 55 feet.
- XV. 8½ miles.
- XVI. 13½ miles.
- XVII. Is masked on a line from the lighthouse bearing north, and ranges from that round by the eastward about 65 degrees, until lost on the shore.

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Circular III.

- XVIII. Fixed : of the natural colour.
 XIX. Nil.
 XX. Sunset to sunrise throughout the year.
 XXI. Catoptric.
 XXII. Two.
 XXIII. Nil.
 XXIV. De Ville and Co., Strand, London. Lamps and reflectors have been made at different times by different parties : the name given is that of the maker most recently employed.
 XXV. Chimney in the roof.
 XXVI. Nil.
 XXVII. Nil.
 XXVIII. Nil.
 XXIX. Cannot be given, vide Nos. V., VI., VIII., and IX.
 XXX. Vide V., VI., VIII., and IX.
 XXXI. The term lantern does not strictly apply. The light-room is the upper floor in the tower, a spacious apartment, constituting also oil store, &c., glazed on one side for the exhibition of the light. No special ventilating arrangements are required. The cost of the lightroom cannot be given.
 XXXII. Vide V., VI., VIII., and IX.
 XXXIII. 10*l.* Either by mechanics attached to the establishment of the board, by workmen engaged on the spot, or by contract, as at the time may be found most expedient.
 XXXIV. Painted, coloured, and papered every three years, when the work is taken by open tender. Last contract 4*l.* Exterior whitewashed.
 XXXV. One keeper at 55*l.* per annum, who is required to provide proper assistance.
 XXXVI.

Glass cylinders - - - -	£ 0 10 0
2 Reflectors - - - - -	66 10 0
2 Lamps - - - - -	17 10 0
Standard fittings, &c. - -	10 10 0
	£94 10 0

(Cost of transport cannot be given.)

- XXXVII. 2*l.* 10*s.* 6*d.* in 1857; 3*l.* in 1858. It being usually understood that "wear and tear" is represented by repairs, no additional amount for that item is here included. Of course reflectors, &c., deteriorate, but it would be difficult to estimate the precise value of such deterioration.
 XXXVIII. Oil, 186 gallons in 1857; 182 gallons in 1858. Wicks, 379 in 1857; 366 in 1858.
 XXXIX. Best refined olive oil, 5*s.* 2*d.* per gallon in 1857; 4*s.* 1*d.* per gallon in 1858.
 XL. Cotton Argand wicks, at 1*s.* 4*d.* per gross; 3*s.* 6*d.* in 1857; 3*s.* 4*d.* in 1858.
 XLI. Nil.
 XLII. Lighthouse dues levied by the Mersey Docks and Harbour Board, paid at the Dock Offices.
 XLIII. The dues being levied as a whole, the proportion due for each lighthouse cannot be distinguished; the whole is therefore given :—Midsummer quarter, 1852, 3,340*l.* 4*s.* 5*d.*; 1858, 3,679*l.* 1*s.* 1*d.* Total income, 1858, 11,543*l.* 14*s.* 10*d.*
 XLIV. The expenditure for each lighthouse can be distinguished, and is here given for this lighthouse :—1852, 131*l.* 16*s.* 11*d.*; 1858, 166*l.* 16*s.* 11*d.*
 XLV. Nil.
 XLVI. Nil.
 XLVII. Nil.
 XLVIII. Nil.
 XLIX. Nil.
 L. By local authorities under the Mersey Docks and Harbour Board.
 LI. Inspections monthly.
 LII. Never.
 LIII. A spare burner to every lamp. Half a set of spare lamps. Oil stored in the lightroom.
 LIV. None.
 LV. None. Could not serve any useful purpose here.
 LVI. A separate telegraph establishment is maintained under the same authorities as the lighthouse.
 LVII. Keepers reside in the building.
 LVIII. A printed copy accompanies these returns.

Only one of the Hoylake lights was seen from the "Vivid," on the night of the 15th of July.

Circular III. POINT LYNAS LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Lynas Lighthouse, Point Lynas, North Coast of Anglesea, Wales.

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- II. Mersey Docks and Harbour Board, Liverpool.
 III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Office, Liverpool.
 IV. Single light.
 V. Unknown.
 VI. Unknown.
 VII. A prominently projecting point on Anglesea coast.
 VIII. First exhibition of light unknown. The lighthouse rebuilt and a fixed light exhibited from existing building 1835; and exhibited on present system 1st November 1839.
 IX. Rebuilt in 1835. Jesse Hartley, Engineer.
 X. Sea light.
 XI. Stone walls, solid. Whitewashed. A castellated structure.
 XII. Iron roof, surmounted with a knob with projecting spikes.
 XIII. Thirty-six feet.
 XIV. One hundred and twenty-eight feet.
 XV. Thirteen miles.
 XVI. Eighteen miles.
 XVII. Ranges round from S. by E. $\frac{1}{2}$ E. by the eastward and northward to N.W. $\frac{1}{2}$ W. on 211 degrees of the horizon.
 XVIII. Flashing.
 XIX. Bright eight seconds, eclipsed two seconds.
 XX. Sunset to sunrise throughout the year.
 XXI. Catoptric.
 XXII. Thirteen.
 XXIII. Nil.
 XXIV. De Ville and Co., Strand, London. Lamps and reflectors have been made at different times by different parties. The name given is that of the maker most recently employed.
 XXV. Chimney in the roof.
 XXVI. Nil.
 XXVII. Nil.
 XXVIII. Nil. The meteorological register at this lighthouse was only commenced during the year, a register having hitherto been kept at a neighbouring telegraph station.
 XXIX. 2,112*l.* 8*s.* (site not included), being built of stone procured on the spot. The price of stone is not included, and cannot be ascertained.
 XXX. Vide XXIX.
 XXXI. The term lantern does not strictly apply. The light-room is on the ground floor, and is an apartment measuring 15 feet long by 13 feet broad. One end forming a segment of a circle is glazed. The dimensions of the apartment are such that no special arrangements for ventilation are needed, and the lightroom being an integral part of the building its cost cannot be distinguished.
 XXXII. Vide No. IX.
 XXXIII. 40*l.* Either by mechanics attached to the establishment of the board, by workmen engaged on the spot, or by contract, as at the time may be found most expedient.
 XXXIV. Painted, coloured, and papered every three years by open tender. Last contract 30*l.* Exterior white washed.
 XXXV. One keeper at 84*l.* per annum. One assistant at 20*l.* 10*s.* per annum.
 XXXVI. 850*l.* 12*s.* (Cost of transport cannot be given.)
 XXXVII. 1857, 4*l.* 1*s.*; 1858, 15*l.* 8*s.* It being generally understood that "wear and tear" is represented by repairs, no additional amount for that item is here included. Of course reflectors, &c. deteriorate, but it would be very difficult to estimate the precise value of such deterioration.
 XXXVIII. Oil, 535 gallons in 1857; 605 gallons in 1858. Wicks, 732 in 1857; 807 in 1858.
 XXXIX. Best refined olive oil, price 5*s.* 2*d.* per gallon in 1857; 4*s.* 1*d.* per gallon in 1858.
 XL. Cotton Argand wicks, 1*s.* 4*d.* per gross; cost 6*s.* 9½*d.* in 1857; 7*s.* 5½*d.* in 1858.
 XLI. Nil.
 XLII. Lighthouse dues are levied by the Mersey Docks and Harbour Board; paid at the Dock Offices.
 XLIII. The dues being levied as a whole, the proportion due for each lighthouse cannot be distinguished; the whole is therefore given :—Midsummer quarter 1852, 3,340*l.* 4*s.* 5*d.*; 1858, 3,679*l.* 1*s.* 1*d.*; total income 1852, 11,543*l.* 14*s.* 10*d.*
 XLIV. The expenditure for each lighthouse can be distinguished, and is here given for this lighthouse :—1852, 261*l.* 3*s.* 1*d.*; 1858, 408*l.* 15*s.* 7*d.*
 XLV. Nil.
 XLVI. Nil.

- LIVERPOOL.**
- XLVII. Nil.
 - XLVIII. Nil.
 - XLIX. Nil.
 - L. By local authorities under the Mersey Docks and Harbour Board.
 - LI. Occasional.
 - LII. Never.
 - LIII. A spare burner to every lamp. Half a set of spare lamps. In the lightroom.
 - LIV. None.
 - LV. None. Could be of no useful purpose here.
 - LVI. A separate telegraph establishment is maintained under the same authorities as the lighthouse.
 - LVII. Keepers reside in the building.
 - LVIII. A printed copy accompanies these returns.

This lighthouse was visited from the "Vivid" on the 13th of July. The 13 lamps and reflectors are arranged on the inside of a curved frame, and placed in a bow window. The flash is produced by boards which are turned by machinery; they turn slowly till their edges are towards the lamps, and then close suddenly, and shut out the light. The machinery is wound by pulling an endless chain hand over hand rapidly. It takes the keeper 20 minutes to wind it; it goes for 4 hours. He says that the labour is excessive "killing." It was tried and found to be severe. The keeper stated, that there was no one in the house able to do this work but himself. The oil appeared to be very good, and the keeper said that it burned very well. The pilot on board praised the light.

The wife and daughters of the keeper perform the work of an assistant. They clean the reflectors, trim the lamps, and watch the light during the first half of the night. Each reflector had a brown holland cover in front, which no lighthouse then visited had got. The reflectors were well polished, quite equal in that respect to any previously seen. They are 23 years old, and are now much worn. The keeper repairs the machinery himself when it gets out of order. The eldest daughter is allowed 8s. a week. The assistant (when there was one), was allowed 12s. The condition of the reflectors showed that the work was very well performed. The whole establishment was neat and clean. It was stated that "the oven was almost unserviceable, and the Board very seldom visit the place."

This light stands No. 33 on the list of lights visited or seen afloat. As compared with the nearest light establishment on the Skerries under the Trinity House, it is decidedly inferior. The machinery, in particular, is very rude.

BIDSTON LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Bidston, Bidston Hill, Cheshire.
- II. Mersey Docks and Harbour Board, Liverpool.
- III. M. T. Parks, Lieutenant Royal Navy, Marine Surveyor and Water Bailiff, Dock Office, Liverpool.
- IV. Single light.
- V. Vide Act 2 Geo. III. cap. 86., A.D. 1761.
- VI. The Act above referred to was promoted by the trustees of the Liverpool Docks, established under the authority of former Acts of Parliament.
- VII. With Leasowe lighthouse forms a leading mark for the Horse channel.
- VIII. 1771.
- IX. Unknown.
- X. Sea-light.
- XI. Stone; walls believed to be solid.
- XII. Iron rod, surmounted by a knob with projecting spikes.
- XIII. Sixty-eight feet.
- XIV. Two hundred and twenty-eight feet.
- XV. Seventeen miles.
- XVI. Twenty-two miles.
- XVII. Is masked in a direction from the lighthouse, bearing N. by E. $\frac{1}{2}$ E., and ranges from that about 100° round by the northward and westward, and is lost on the Welsh land.
- XVIII. Fixed; of the natural colour.
- XIX. Nil.
- XX. Sunset to sunrise throughout the year.
- XXI. Catoptric.

- LIVERPOOL.**
- XXII. Eleven.
 - XXIII. Nil.
 - XXIV. De Ville and Co., Strand, London. Lamps and reflectors have been made at different times by different parties. The name given is that of the maker most recently employed.
 - XXV. Chimney in the roof.
 - XXVI. Nil.
 - XXVII. Nil.
 - XXVIII. Nil.
 - XXIX. Cannot be given. Vide V, VI, VIII, and IX.
 - XXX. Vide V, VI, VIII, and IX.
 - XXXI. The term lantern does not strictly apply. The lightroom constitutes the upper floor of the tower, and is an apartment 22 feet by 17 feet, by about 16 feet high; a space on one side 12 feet high by 18 feet wide, being glazed. The dimensions of the apartment are such that no special ventilating apparatus is needed. The lightroom being an integral part of the building, its cost cannot be ascertained.
 - XXXII. Not purchased.
 - XXXIII. 65*l*. Either by mechanics attached to the establishment of the Board, by workmen engaged on the spot, or by contract, as at the time may be found expedient.
 - XXXIV. Painted, coloured, and papered every three years, by open tenders. Last tender 41*l*. Exterior, white stone; requires no coating.
 - XXXV. One keeper at 73*l*, 10s. per annum, who is required to provide an assistant.
 - XXXVI. Glass cylinders - - - - - 1 12 0
Eleven reflectors - - - - - 247 10 0
Eleven lamps - - - - - 42 10 0
Standard fittings, &c., estimated - 20 0 0

£311 12 0

(Cost of transport cannot be given.)

- XXXVII. 1857, 8*l*, 15s. 6*d*.; 1858, 9*l*, 13s. 6*d*. It being usually understood that "wear and tear" is represented by repairs; no additional amount for that item is here included. Of course reflectors, &c. deteriorate, but it would be very difficult to estimate the precise value of such deterioration.
- XXXVIII. Oil, 544 gallons in 1857; 544 gallons in 1858. Wicks, 1,812 in 1857; 1,838 in 1858.
- XXXIX. Best refined olive oil, 5s. 2*d*. per gallon in 1857; 4s. 1*d*. per gallon in 1858.
- XL. Cotton argand wicks at 1s. 4*d*. per gross. Cost, 1857, 1*l*.s. 9*d*.; 1858, 1*l*.s. 11*d*.
- XLI. Nil.
- XLII. Lighthouse dues levied by the Mersey Docks and Harbour Board; paid at the Dock Offices.
- XLIII. The dues being levied as a whole, the proportion due for each lighthouse cannot be distinguished, the whole is therefore given—Midsummer quarter, 1852, 3,340*l*. 4s. 5*d*.; 1858, 3,679*l*. 1s. 1*d*. Total income, 1852, 11,543*l*. 14s. 10*d*.
- XLIV. The expenditure for each lighthouse can be distinguished, and is here given for this lighthouse:—1852, 251*l*. 4s. 4*d*.; 1858, 269*l*. 3s. 3*d*.
- XLV. Nil.
- XLVI. Nil.
- XLVII. Nil.
- XLVIII. Nil.
- XLIX. Nil.
- L. By local authorities under the Mersey Docks and Harbour Board.
- LI. Inspections monthly.
- LII. Never.
- LIII. A spare burner to every lamp. Half a set of spare lamps. Oil stored in lightroom.
- LIV. None.
- LV. None. The lighthouse is $\frac{1}{2}$ miles from the sea, and tide signals can be of no use.
- LVI. A separate telegraph establishment, maintained under the same authorities as lighthouses, is located in adjoining premises.
- LVII. Keepers reside in the building.
- LVIII. A printed copy accompanies these returns.
N.B. Bidston lighthouse was built to supersede a lighthouse, which was situated on the sea-shore N.W. of Leasowe lighthouse; the latter being washed away, Bidston was erected in such a position as to form the same line of direction as before with the remaining Leasowe lighthouse.

This lighthouse was visited on the 14th of July 1859. The house was moderately clean. The keeper by Observations Commissioners.

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was found to be a woman apparently about 60 years of age, infirm, and, by her own admission, in weak health. She is assisted by her husband and niece. Her father kept the lighthouse before her.

There are 11 reflectors, but 9 only face the offing. The reflectors were very dull; they had been up for 30 years. The keeper stated that they were scoured every month. Two were sent for next morning, and one sent to a silversmith to be cleaned. In an hour and a half it was returned with the following note.—68 and 70 *Lord Street, Liverpool, July 15, 1859.*—*Sir, the cause of the dullness on the surface of the reflector is that it has not been properly cleaned. I should think the powder used for the purpose was not free from grit as it should be, hence the scratching. I have done the best I could with it in the short time allowed.*

(Signed) *John I. Mayer for Thomas Raris.*

The reflector was not so bright when returned by the silversmith as those previously seen in other lighthouses, for example, at Lynas; but it was very different from the other which was kept for comparison, in the condition in which it left the lighthouse.

There is a hot air apparatus for heating the oil in the lamps. The two outer reflectors had brown holland covers to protect them from the fingers of visitors.

The telegraph station is on the same premises, and is in charge of the light keeper's sister.

The light was observed from the "Vivid" on the night of the 15th. It was lighted at about 9 p.m., the sun had set soon after 8. It was remarked that from the Queen's Channel, Bidston, it appeared very dim. This might be accounted for in some degree if the reflectors are set for some other channel; but compared with the Rock it appeared dull and poor. No. 36 on the list of lights visited or seen alight.

On the 15th of July, 7 captains of Mr. MacIver's ships were examined. All thought that Bidston should be a light of the very first class; 5 thought it was bad, and 2 that it was good enough.

On the same day 5 pilots were examined. They all agreed that Bidston should be as good as possible; that it is the finest light on the coast; that they have never seen a steady light equal to it; one has seen it at 25 miles, another 27. All agreed that it should be a fixed light, and that it cannot be too good; one said that it might be improved. They see the Skerries occasionally. "Flat and the Calf of Man are rather better."

On the same day two captains of tug boats stated that "Bidston is a very good light, as good as any" in the channel; they have seen it 20 or 25 miles.

According to the printed mariners' evidence the light on the Calf of Man has been seen at a distance of 42 miles (see 27, No. 377-541) by two witnesses. That light is favourably mentioned by 21 witnesses; South Stack is favourably mentioned by 23; Skerries by 2; Bidston by 5, namely, 608, John Williams; 609, William Hughes; 611, John Bank; 612, James Wilson; 618, Joseph Powell; who are Liverpool pilots.

It is therefore clear, that Bidston, as compared with lighthouses under other jurisdictions, is decidedly inferior, except in the opinion of local mariners, who agree that it should be a first-class light, and generally compare it with those in the neighbourhood which are under the same jurisdiction.

2. The lights are to be properly exhibited, punctually, at sunset, and continued till sunrise, when they are to be extinguished.

3. The keeper is held responsible for the careful watching and trimming of the lamps throughout the night, and is required to be in attendance during the day, and is not to absent himself from duty, except by leave of the Board, signified in writing.

4. The keeper is to note the time of lighting up all other lightships and lighthouses within his view, and is to report the cause of his missing any during the night, except when they are obscured by reason of fog.

5. He must take charge of all stores, oil, and lighting materials, keeping a strict account in a book provided for that purpose of the quantity daily consumed, and send a copy of the expenditure and stock remaining on hand at the end of each month to the Marine Surveyor; he is cautioned not to waste or destroy, or permit any of the stores to be wasted or destroyed; and should any loss occur through his negligence or carelessness, the amount of such loss will be deducted from his salary.

6. On the first day of each month regularly, and at such other times as any unforeseen contingency may render necessary, he must send to the Marine Surveyor's office a list of such stores as may be required, taking care that such sufficient notice be given as may ensure a timely supply of any deficiency.

7. He must request all visitors to enter their names in the visitor's book, stating whether by his own permission, or by whose order they inspect the lighthouse, and is to take care that they in no wise deface the building, scratch, or injure the reflectors or fittings, and must by no means permit strangers to remain alone in the lightroom. He is strictly prohibited from soliciting or accepting money or presents of any kind, on pain of dismissal.

8. He is strictly forbidden to let apartments in the lighthouse, or take in lodgers at any season of the year.

9. Drunkenness, or any such irregularity of conduct, will be visited with immediate dismissal.

10. The plate-glass of the lightroom is to be kept clean within and without, by night as well as by day, particularly from drift-snow and moisture, which is apt to accumulate on the windows. The reflectors are to be polished daily, and carefully cleaned with the proper materials only; the lamps to be trimmed and the lightroom to be put in perfect order not later than 10 o'clock a.m.; and strict order and cleanliness is to be maintained in every part of the building and premises.

11. A constant look-out is to be kept for vessels in distress, and on any being observed within the probable reach of the lifeboats, the distress flag is to be hoisted over the numbers per chart which indicate the position of the vessel; the time of hoisting the signal, and remarks as to the assistance rendered are to be noted.

12. A look-out is to be maintained upon the light-ships, beacons, and buoys, and information of any accident to them, or any ease of unassisted wreck, or illness or other contingencies which cannot be communicated by signal, is to be forwarded forthwith in writing, by messenger, to the Marine Surveyor's office.

13. The fire-buckets are to be kept constantly filled with water in the lightroom, and they are on no account to be used for household purposes. The water in them is to be changed frequently, and the keeper is strictly enjoined to use his utmost vigilance for the prevention of fire in the building and lightroom.

Revolving or Flashing Lights.

14. On extinguishing the lights in the morning, every part of the machinery is to be carefully examined, the weights to be wound up, and the whole ascertained to be in good working order, and such care is to be taken in the trimming, supply of cotton wick, &c., to the lamps, or in the winding of the machinery, that no necessity may arise during the night for stopping the machinery for any purpose, and the winding-up is not at any time to be delayed to within one hour of the extreme period for which the machine is calculated to run.

15. The wear of any parts of the machinery, or anything which may interfere with its efficient working, must be reported in writing immediately to the Marine Surveyor; and the mode of working is not to be exhibited to strangers or others during the day, lest from inadvertence, or otherwise, any injury should arise which may impede or stop its action during the night.

Point Lynas.—Special Regulation.

16. The keeper is held responsible for the efficient condition of the machinery under his charge; and in the event

Circular H.
Regulations.

MERSEY DOCKS AND HARBOUR BOARD.

REGULATIONS for the MANAGEMENT of LIGHTHOUSES.

General.

1. The lighthouse keepers are severally held responsible that the following regulations, as applicable to the respective lighthouses, are strictly attended to, and any negligence will subject the keeper to the severe displeasure of the Board.

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 of any accident to the light, lamps, lightroom, or machinery which may impede the due exhibition of the light, repairs are to be effected by mechanics to be engaged on the spot; such accidents, cases of personal illness, or any circumstances tending to interfere with the due performance of his duties, are to be communicated by post, without delay, to the Marine Surveyor.

Rock Lighthouse.—Special Regulations.

17. The keeper and assistant keepers are to arrange their turns on shore so that two shall constantly be on duty in the building, and during the night one is constantly to be on watch; the watches to be from sunset to midnight, and midnight to sunrise, and are to be so arranged that the keeper of the first watch on one night is to take the second watch on the following night.

18. Previous to giving up charge of the first watch, the whole of the lamps are to be properly trimmed and lights burning to their full power, clean cylinders to be fitted on, and the machinery to be wound up and going correctly, great care being taken that no variation may occur in the period of revolution, and the keeper on watch is not to give up charge until his relief has duly assumed his duty.

19. The senior keeper on duty by day, and the keeper on watch by night, are held responsible that the bells are kept ringing during fog, and for the proper exhibition of the tide ball, or tide lights, while the water is up to or above the base of the lighthouse, and they are to be careful in keeping a correct account of shipping passing in and out by the Rock Channel, and to be forwarded to the office monthly with the log and store accounts.

20. The whole of the window-shutters of the tower are to be closed at sunset, to prevent any light being seen therefrom. On no account is any dirt or slops to be thrown out of the windows, balcony, or door.

M. T. PARKS,
 Marine Surveyor and Water Bailiff.

REGULATIONS for the MANAGEMENT of the FLOATING LIGHTS.

1. The crews of the respective lightships are established as follows, viz.:—N.W. lightship, 2 masters and 12 men; Formby lightship, 2 masters and 8 men; Crosby lightship, 2 masters and 8 men; but all are subject to do duty in either vessel, as the exigencies of the service may require.

2. The wages of masters are as follows:—N.W. ship, 110*l.* per annum; Formby ship, 100*l.* per annum; Crosby ship, 90*l.* per annum; and the wages of seamen 2*l.* 10*s.* per month each.

3. The masters shall be paid their salaries every quarter after the first four months, leaving one month in arrears, which will be forfeited if they quit the service without giving three months' previous notice to the Marine Surveyor, which notice shall be immediately reported to the Board. The seaman shall be paid every month after the first two months, leaving one month in hand, which will be forfeited if they quit the service without giving one month previous notice. The pay of the masters and men will be subject to making good any loss or injury the vessel, her furniture, or stores may sustain from their individual neglect or carelessness.

4. Every master and seaman is required to provide himself with provisions subject to the directions of the marine surveyor as to the time of taking such provisions on board; an allowance for the supply of provisions is paid to each master at the rate of 17*s.* 6*d.* per week, and to each seaman 13*s.* 6*d.* per week. This allowance is paid each fortnight in advance. Spirituous liquors of all kinds are strictly prohibited. In order to prevent the risk of want of provisions from bad weather, or any unforeseen occurrence, a supply of biscuit, pork, and peas is placed on board each vessel in the care of the master, to be accounted for by him, and charged at prime cost to such of the men as may require to be supplied therefrom.

5. Each master and seaman is held liable to do duty on board the Buoy Tender, and to assist whenever required in placing or removing buoys, and to go on surveying, light-house or lifeboat service, when called upon by the Marine Surveyor, and is held responsible for the safe and prompt delivery of all stores committed to his charge.

6. The number of the crew to be actually on board each ship on service is as follows:—N.W. ship, 1 master and 7 men; Formby ship, 1 master and 5 men; Crosby ship, 1 master and 4 men; their relief to be regulated as nearly as circumstances will permit as follows, viz.:—Each master alternately a month afloat and a month ashore; each seaman two months afloat and one month on shore; and in consideration that when on shore the seamen are frequently called away unexpectedly on services named in Article 5,

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 and being unprepared are put to extra expense in providing themselves under such circumstances, an addition of 2*s.* 6*d.* per month is paid to the seamen constituting the relief on shore.

7. A strict and careful inventory must be kept of each vessel's stores. Each master must examine them, and take the receipt of the succeeding master every month, bringing to the Marine Surveyor's office a copy of the charge of stores left on board with a list of stores expended; and those required in lieu, according to the form supplied; and this article of instruction equally applies to the duplicate vessels, which must be visited by the masters on shore, who are held responsible that each duplicate is kept ready, in every respect, to replace either ship at a tide's notice.

8. Each master and seaman must put his address on the public board in the Marine Surveyor's office; and each master on shore must muster his shore party and report himself at the said office every morning by nine o'clock, and state where he is to be found during that day, and each master alternately must inquire for orders every evening at four o'clock, when not otherwise employed by the Marine Surveyor.

9. In keeping the account of stores and bringing monthly returns to the Marine Surveyor, care must be taken that they are not allowed to run within a fortnight's expenditure, and if anything is required forthwith, it must be stated separately and specially.

10. Each master must take especial care that the lamps and lanterns are constantly kept clean and in good order, as well as every other material belonging to the vessel, and that the lights are properly exhibited every night from sunset to sunrise.

11. Each master must take care that the oil is always emptied into the tanks, and all stores properly stowed away as soon as received on board, and that none are embezzled, stolen, wasted, or lost, as the value of such as may be missing will be deducted from his wages, unless satisfactorily traced or accounted for.

12. Each master must keep a journal of all occurrences and observations according to the form supplied, which is to be read every day at noon to the crew, and signed by the master and senior seaman, so that the occurrences of the night may be faithfully given as observed by the watch on deck.

13. In case of death or any accident incapacitating the master in command of a lightship, the temporary command shall devolve upon the senior seaman on board, the seniority being reckoned according to the length of servitude in the lightships under the Board, except if from any cause a seaman shall have shown himself incompetent, and the Marine Surveyor shall have seen fit to appoint him as junior although having longer servitude than others, when the order of assuming command shall be according to such appointment.

14. Each master must at every opportunity carefully examine the state of the moorings, by sighting them as far down as possible, inserting in the logbook a report of their condition; and he must examine the bridles and swivels every day, taking care to have spare shackles and forelocks at hand.

15. Should the vessel part from her moorings totally, the ball by day or lights by night must be instantly struck; but if only parting one leg of the moorings, the lights and ball are to be exhibited until she so drives as to open the marks and render her a false object. In each case the distress signals appointed are to be shown, and every step taken to send prompt information to the Marine Surveyor's office, the master using all seamanlike precautions to maintain his station, or when that is absolutely impossible to conduct his vessel into safety, being careful in seeing his sails ready, anchors clear, and cables ranged, and to have the deep sea lead stopped over the side every evening before dark to enable him to detect driving in thick weather; mustering his crew at proper times to see that they are sober and orderly.

16. Each master must be extremely careful of fire and lights, he must frequently visit the fore cabins, and when the inclemency of the weather requires a continuance of fire in the night, he must see that it is within bounds and safe. The fire-buckets are to be filled every evening, and the crew are to be stationed so as to make the best use of them in case of fire.

17. The master of the N.W. lightship must pay particular attention to the punctual burning of the blue lights at the appointed times, and must on no account allow anybody but himself to interfere with the stock, but give out the required number for each night, which must be kept distinct from the stock, and none of the blue lights are ever to be taken below.

18. Each master must be vigilant throughout the day,

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attending to the signals established for communicating with the Tender and Telegraphs respecting buoys, distressed vessels, &c. The gong belonging to the N. W. lightship is to be struck every five minutes in foggy weather. The time on board is to be corrected daily by the one o'clock signal at Helbre Island. The bell belonging to the Formby and Crosby light vessels must be rung at intervals of five minutes during fog, and the masters must note most carefully (according to the form supplied) the vessels that pass through the Northern Channels, both inward and outward bound whether by night or day; and each master is to send such information by telegraph as circumstances may require and weather permit.

19. Each master must be at all calls in the night. He must appoint the watch each evening, and enter their names in the column of the logbook. He must be called at the end of each watch, and attend the fresh trimming of tōh lights, taking care that a signal lantern replaces the large lantern whilst down. The half-hours must be regularly struck on the bell.

20. Each vessel must be kept thoroughly clean, but the decks must not be stoned more than once a month, and as little water sluiced about below as possible. All wetting must be done in the forenoon, so as to be thoroughly dry below by nightfall.

21. Whether aloft or on shore, each seaman is required promptly to obey the directions of the Marine Surveyor and of the officers acting under his orders, and must also be ready to obey any order for the good of the service from any of the officers of the Mersey Dock and Harbour Board; and in the event of any seaman misbehaving himself, or in anywise disobeying orders, the case must immediately be reported to the Marine Surveyor.

22. Each master must by his own example and attention, enforce through cleanliness of person, total freedom from foul language and strict sobriety; every man is expected to be decently dressed, to air his bedding on deck every other day, and is recommended to attend morning and evening prayers each day in the cabin.

23. Neither the masters nor any of the crew shall, on any pretence whatever, go on shore or quit the vessel during the time of their service on board their respective vessels, unless by special order from the Marine Surveyor.

24. Each master must take care that neither he nor any of his men be concerned in aiding or assisting others in running any goods out of any ship, vessel, or boat, to the prejudice of Her Majesty's Revenue, and he must not suffer goods of any kind, nor spirituous liquors, to be brought on board the light-vessel or tender, from any ship or vessel whatever, except from vessels in distress, and, in that case, he must take care that there be no embezzlement or damage, or practices whatever, that may prejudice the owners or the Crown, and he must report all occurrences of this nature in his journal.

25. Masters are forbidden from permitting any others than the officers and men of the establishment to board their ships, except pilots, who, in the course of their duty, may be obliged to seek admission, and others requiring refuge under circumstances of danger or necessity. Persons so admitted are not to be permitted to remain on board if opportunity arises for sending them ashore; the lightship's boat is not, however, to be permitted to put them on shore, nor are irregular signals to be made in their behalf, but such only as can be regularly communicated by the telegraphic code. Should any distressed crew be compelled to seek refuge on board, the master is authorized to provision them from the ship's store, inserting their names and the name of the vessel to which they have belonged in his log, and noting the expenditure of provisions in its proper place; and whenever persons are compelled to seek refuge on board, the circumstances attending the case are to be reported fully in writing to the Marine Surveyor.

26. The masters must endeavour to hail any steam vessels which may be lying or hovering near the floating lights, so as to prevent as much as possible the lights from being obscured by their smoke or steam, and they must not permit any vessel to make fast to the floating lights.

27. Each master must sign the foregoing instructions and regulations on being appointed.

M. T. PARKS,
Marine Surveyor and Water Bailiff.

III. They are designed to act as fairway beacons to the several channels.

IV. Two are maintained; one at moorings in the Mersey, the other in wet dock; are fully equipped ready for service. Two shipkeepers are attached to the former, and one to the latter.

V. By colour, by number of masts, by number of lights exhibited, and by bells at the mastheads.

VI. The N. W. lightship is distinguished by a blue light burnt every two hours during darkness; but the positions of the light vessels themselves prevent misapprehension of the lights they exhibit; the exhibition of two or three lights from the same vessel make it impossible that they can be misapprehended, and even where a single light is exhibited its brilliancy so far exceeds that of a ship's light that a mistake can hardly arise; and the fact of their being fairway lights renders their approach for purposes of identification almost free from danger.

VII. Catoptric.

VIII. The description used is that known as catoptric, and was in use before the dioptric system came into general use for lighthouses. It is not understood that the dioptric system has anywhere been adopted to lightships moored in exposed situations, such as those in Liverpool Bay.

XI. Fixed.

X. The lightvessels are distinguished by the number of their lights, and not by the characteristics of fixed, revolving, &c. All are fixed, and all are of the natural colour.

XI. Vide Table.

XII. The ordinary parabolic reflector and fountain lamp is the only one in use. Drawings accompany these returns.

XIII. The only signals that can be of use in fogs are those which convey sound; therefore, bells and gongs are used.

XIV. No tide signals are in use.

XV. Nil.

Year ending 2th June,	Floating Light Dues.			Wages, Victualling, and Repairs of Lightships.		
	£	s.	d.	£	s.	d.
1846	3,775	15	1	4,571	4	5
1847	4,231	1	6	6,296	3	0
1848	3,998	4	8	5,426	16	4
1849	4,496	16	2	4,170	13	6
1850	4,332	0	0	4,827	9	5
1851	4,759	17	6	4,227	17	1
1852	5,092	2	3	3,961	3	8
1853	5,121	3	1	4,208	7	3
1854	5,845	5	3	4,283	5	6
1855	5,407	18	3	4,416	14	11
1856	6,017	4	2	4,58	10	8
1857	6,412	4	5	4,504	2	6
1858	6,096	11	6	4,393	13	9

N.B.—It must be observed that the annexed statement of expenses of maintenance does not include the expenses of supervision or monthly relief by the tender, but only the actual expenditure of the lightships themselves.

The comparison of income and expenditure by means of the amounts stated in answer to this question is liable to lead to misapprehension, unless it be remembered that the dues collected in the port of Liverpool under the head of Light Dues are levied under various Acts of Parliament, which authorize the maintenance of other establishments from the same fund. Thus the peculiar shifting nature of the sands entails the necessity of extensive surveys, which are required generally annually. The expenses attendant upon these, as well as the maintenance of a telegraph establishment, of lifeboats, and of buoys and beacons, and the conservancy expenses attendant upon the preservation of the anchorage in the river, are liquidated by the general light fund, comprising the lighthouse and floating light dues.

XVII. Such improvements are submitted to the officers of the particular department to which they belong, and are experimented or not as may seem expedient; and results are reported to the superior authority for consideration.

XVIII. Copies accompany these returns.

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MERSEY FLOATING LIGHTS.—(GENERAL RETURNS.)

- I. Mersey Docks and Harbour Board, Liverpool.
- II N.W. lightship; Formby lightship; Crosby lightship. A chart accompanies these returns.

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	Application:	Approval.
XIX. Formby lightship	August 24, 1856	- September 12.
"	- Sept. 10, 1857	- September 15.
"	- June 25, 1858	- June 26.
Crosby lightship	- August 28, 1856	- September 12.

The several applications were all complied with.

Under recent Acts of Parliament, before discontinuing any established buoy or beacon, or establishing any new one, or altering the site of one now existing, the proposed change is submitted to the Trinity Board in London for approval. The cases specified in answer to this question refer in each case to changes of site of light vessels, rendered necessary by changes in the banks and channels, and are not intended to convey the idea that any applications have been made for the establishment of additional light-vessels.

The whole of these lights were observed from the "Vivid" on the night of 15th of July. The Formby and Crosby lightvessels were not boarded, because the Commission were anxious to see the buoys before dark. It was observed that the "winking" of the lights was less marked than it was in the Conibegs light, which has swinging lamps. There was much more sea on when the Conibegs light was passed; but it was then evident that gimbals do not prevent the light from winking, as its apparent flickering is termed by pilots and others.

TABLE OF PRICES.

NORTH-WEST LIGHTSHIP.—3 Lights. Catoptric. 24 Burners.

Price	-	Fixed.	1,428 <i>l.</i> , includes lanterns and illuminating fittings only. Does not include winches, purchases, and mast fittings.
Ordinary repairs	-	78 <i>7</i> l. 4 <i>s.</i> 1 <i>d.</i> , includes entire expense of maintenance attached to the lightship, except wages, victualling, tender's attendance, supervision, &c.	
Oil	Consumption	16·9 gallons and decimal parts, average of past eight years.	
		Cost - - 2 <i>l.</i> 16 <i>s.</i> 3 <i>d.</i> , estimated at 3 <i>s.</i> 4 <i>d.</i> per gallon. Actual average cost of eight years, 4 <i>s.</i> 9 <i>d.</i> per gallon.	
Wicks	Consumption	25·4 wicks and decimal parts.	
		Cost - - 7 <i>d.</i> , nearly at present cost.	

FORMBY LIGHTSHIP.—2 Lights. Catoptric. 16 Burners.

Price	-	Fixed.	952 <i>l.</i> , includes lanterns and illuminating fittings only. Does not include winches, purchases, and mast fittings.
Ordinary repairs	-	519 <i>l.</i> 1 <i>s.</i> 10 <i>d.</i> , includes entire expense of maintenance attached to the lightship, except wages, victualling, tender's attendance, supervision, &c.	
Oil	Consumption	12·00 gallons, average of past eight years.	
		Cost - - 2 <i>l.</i> , estimated at 3 <i>s.</i> 4 <i>d.</i> per gallon. Actual average cost of eight years 4 <i>s.</i> 9 <i>d.</i> per gallon.	
Wicks	Consumption	17·3 wicks, and decimal parts.	
		Cost - - 5 <i>d.</i> , nearly at present cost.	

CROSBY LIGHTSHIP.—1 Light. Catoptric. 8 Burners.

Price	-	Fixed.	476 <i>l.</i> , includes lantern and illuminating fittings only. Does not include winches, purchases, and mast fittings.
Ordinary repairs	-	397 <i>l.</i> 18 <i>s.</i> , includes entire expense of maintenance attached to the lightship, except wages, victualling, tender's attendance, supervision, &c.	
Oil	Consumption	6·2 gallons and decimal parts. Average of past eight years.	
		Cost - - 1 <i>l.</i> 0 <i>s.</i> 7 <i>d.</i> , estimated at 3 <i>s.</i> 4 <i>d.</i> per gallon. Actual average cost of eight years 4 <i>s.</i> 9 <i>d.</i> per gallon.	
Wicks	Consumption	6·7 wicks and decimal parts.	
		Cost - - 2 <i>d.</i> , nearly at present cost.	

CROSBY CHANNEL FLOATING LIGHT.

(SPECIAL RETURN.)

- I. Crosby lightship "Meteor," moored in the elbow of Crosby Channel, forming the fairway guide to and from the River Mersey.
- II. Depth 8 fathoms, sandy bottom; maximum rate of current, 4 knots.
- III. Mersey Docks and Harbour Board, Liverpool.
- IV. Lieutenant M. T. Parks, Royal Navy, Marine Surveyor and Water Bailiff, Liverpool.
- V. About the beginning of the year 1840, by the marine surveyor of the port.
- VI. To form a fairway guide in the elbow of the Crosby Channel.
- VII. Since 1840.
- VIII. Single light.
- IX. Length, 87 feet; breadth, 19 feet 3 inches; depth, 11 feet.
- X. Timber.
- XI. One hundred and forty-two tons.
- XII. 1855. Humble and Milcrest, Liverpool.
- XIII. Forward, 9 feet 6 inches; abaft, 12 feet 6 inches.
- XIV. Red.
- XV. Three-masted vessel; ball at mainmast head.
- XVI. Lug sails and fore staysails.
- XVII. Nil.
- XVIII. Span moorings, 90 fathoms on each arm, laid N.N.W. and S.S.E. Has on board 2 10-cwt. bower anchors, and 180 fathoms 1½ inch bower cable.
- XIX. Moorings of 1½ inch chain, without studs. Anchors, four palmed, of 16 cwt.
- XX. Various. The last chain supplied was by H. Wood and Co., of Saltney, near Chester.
- XXI. 33 feet 6 inches.
- XXII. Six and a half miles.
- XXIII. Eleven and a half miles.
- XXIV. Fixed, of the natural colour.
- XXV. Nil.
- XXVI. Sunset to sunrise throughout the year.
- XXVII. Catoptric.
- XXVIII. Eight burners.
- XXIX. Nil.
- XXX. De Ville and Co., Strand, London.
- XXXI. Hoisted by chain ties, purchase, and winch.
- XXXII. Bell.
- XXXIII., XXXIV. Sixty-eight days. These numbers include every day when the bell was rung, whether for a long or short period. It is not intended to convey the idea that there were 68 days of fog.
- XXXV. 1,987*l.*
- XXXVI. The present lightship was built and designed for the N.W. station in 1835, when lanterns, masts, and many other fittings differing from those now used were placed on board. The numerous modifications that have since taken place, together with the circumstance that the vessel was built to carry three lights in an exposed situation, and now carries but one in a smooth-water station, prevents a fair statement of expense of this ship, as appropriate for a lightship for this station, being given.
- XXXVII. 330*l.* This sum includes the renewal of moorings and all ship's stores, except victualling, salaries, oil, wick, and cleaning materials for lighting apparatus. Minor purchases of stores and repairs are effected by the officials of the establishment; larger matters by open tender, as may be required.
- XXXVIII. Two masters and eight men, of whom one master and four men are always on board. One man is retained on shore for occasional relief to other ships in cases of sickness, &c. The remainder constitute monthly relief.
- XXXIX. Masters, 9*l.* per annum; seamen, 2*l.* 10*s.* per month.
- XL. Victualled by allowances, viz. :—
Two masters, at 17*s.* 6*d.* per week each - - - £91 0 0 per annum.
Eight men, at 13*s.* 6*d.* per week each - - - 281 16 0 "
Total - - - £371 16 0 "
- XLI. Nil. Vide No. XL.
- XLII. Chain cable, 22*s.* per cwt. Anchor 32*s.* per cwt.
- XLIII. One lantern with reflectors, lamps, &c. complete, 476*l.*

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Circular IV.

LIVERPOOL.	LIVERPOOL.	LIVERPOOL.	LIVERPOOL.
Circular IV.	XLIV. 18s. in 1857; 4 <i>l.</i> 19 <i>s.</i> 2 <i>d.</i> in 1858.	XX. Various; the latest by H. Wood and Co., of Saltney and Liverpool.	XXI. Fore 26 feet; mizen 20 feet.
	XLV. Oil, 241 gallons in 1857; 242 gallons in 1858. Wicks, 228 in 1857; 296 in 1858.		XXII. From forelight 5½ miles; mizen 5 miles.
	XLVI. The oil used is the best refined olive, and the price necessarily varies according to the state of the market, having exceeded at times 6 <i>s.</i> per gallon. A supply received in May 1858 was at 4 <i>s.</i> 1 <i>d.</i> per gallon; in January 1859 at 4 <i>s.</i> 3 <i>d.</i> per gallon. Taking these as a present fair average cost, the above years amount to 50 <i>l.</i>		XXIII. Ten and a half miles.
	XLVII. The above remark as to price applies again. The description used is cotton tape wick. The last supply at 2½ <i>d.</i> per yard, 1 yard = 8 wicks = nearly 8 <i>s.</i> per annum.		XXIV. Fixed; of the natural colour.
	XLVIII. No special apparatus.		XXV. Nil.
	XLIX. Floating light dues are levied by the Mersey Docks and Harbour Board, and payable at the Mersey Docks Office.		XXVI. Sunset to sunrise the whole year.
L.	The dues being levied as a whole the proportion due for a particular lightship cannot be distinguished. The whole amount levied in 1852 amounted to 5,092 <i>l.</i> 2 <i>s.</i> 3 <i>d.</i> Midsummer quarter 1852, 1,476 <i>l.</i> ; 1858, 1,698 <i>l.</i>		XXVII. Catoptric.
LI.	The expenditure can be distinguished for each ship, and is for the Crosby ship, for 1852, 903 <i>l.</i> 7 <i>s.</i> 8 <i>d.</i> , and for 1858, 1,051 <i>l.</i> 8 <i>s.</i> 4 <i>d.</i>		XXVIII. Eight burners in each lantern.
LII.	Nil.		XXIX. None.
LIII.	Nil.		XXX. De Ville and Co., Strand, London.
LIV.	Nil.		XXXI. Hoisted by chain ties, purchase, and winch.
LV.	Nil.		XXXII. Bell.
LVI.	Nil.		XXXIII. Seventy-three.
LVII.	Nil.		} These numbers include fogs of very short duration, and are not intended to convey the idea that 73 days of fog existed.
LVIII.	By local authorities under the Mersey Docks and Harbour Board.		
LIX.	Monthly.		XXXIV. Seventy-three.
LX.	Never.		XXXV. 1,754 <i>l.</i>
LXI.	Never.		XXXVI. 3,900 <i>l.</i>
LXII.	Barometer and thermometer.		XXXVII. 390 <i>l.</i> This expenditure includes the renewal of moorings and all ship's stores, except salaries, victualling, oil, wick, and cleaning materials for illuminating apparatus. Minor purchases of stores and repairs are effected by the officials of the establishment; larger matters are effected by open tender as may be required.
LXIII.	None. A separate lifeboat establishment is maintained under the same authorities as the lightships.		XXXVIII. Two masters and eight men, of whom one master and five men are always on board, and are relieved in monthly rotation by the remainder.
LXIV.	Marryat's and local codes of signals are used. A separate telegraph establishment is also maintained.		XXXIX. 2 <i>l.</i> 10 <i>s.</i> per month per man; master, 100 <i>l.</i> per annum.
LXV.	Nil.		XL. Victualled by allowances, viz.:—
LXVI.	Monthly. Two months on board and one month on shore.		Two masters at 17 <i>s.</i> 6 <i>d.</i> per week £91 0 <i>s.</i> per annum.
LXVII.	A tender for attending on the buoyage and beaconage of the port is maintained.		Eight men at 13 <i>s.</i> 6 <i>d.</i> „ 280 16 „
LXVIII.	Two spare lightships ready for instant service are maintained.		Total - - - £371 16 „
LXIX.	A copy accompanies these returns.		
Circular IV.	FORMBY LIGHTSHIP.—(SPECIAL RETURN.)		
I.	Formby lightship, "Queen," moored at the elbow of the Queen's and Crosby Channels in Liverpool Bay.		XLII. Nil. Vide No. XI.
II.	Depth 4½ fathoms; bottom sand. Maximum force of current, 3 knots.		XLIII. Chain cable 22 <i>s.</i> per cwt.; anchors 32 <i>s.</i>
III.	Mersey Docks and Harbour Board, Liverpool.		XLIII. Two lanterns, with lamps, reflectors, &c. complete, at 47 <i>l.</i> each = 952 <i>l.</i>
IV.	Lieutenant M. T. Parks, Royal Navy, Marine Surveyor and Water Bailiff, Dock Office, Liverpool.		XLIV. 14 <i>l.</i> 18 <i>s.</i> 7 <i>d.</i> in 1857; 8 <i>l.</i> 4 <i>s.</i> 11 <i>d.</i> in 1858.
V.	1833; by Captain Denham, Royal Navy.		XLV. Oil, 515 gallons in 1857; 512 gallons in 1858. Wicks, 744 in 1857; 744 in 1858.
VI.	To form a leading line with Formby shore light through the sea channel.		XLVI. The oil used is best refined olive oil, and the price necessarily varies according to the state of the market, having exceeded at times 6 <i>s.</i> per gallon. The supply received in May 1858 was at 4 <i>s.</i> 1 <i>d.</i> per gallon; in January 1859, 4 <i>s.</i> 3 <i>d.</i> ; taking the mean of these as a present fair average cost, the above years amount to about 107 <i>l.</i> each year.
VII.	With occasional changes of site consequent upon changes of channels a lightship has been appropriated to the station since 1833.		XLVII. The above remark as to price applies again. The description used is cotton tape wick; the last supply at 2½ <i>d.</i> per yard. 1 yard = 8 wicks = 1 <i>l.</i> per annum.
VIII.	Two lights on separate masts, fore and mizen; the fore at 26 feet, the mizen at 20 feet above the water line.		XLVIII. No special apparatus.
IX.	Length over all 73 feet; breadth, extreme, 17 feet; depth from under side of upper decks to keelson 8 feet 6 inches.		XLIX. Floating light dues are levied by the Mersey Docks and Harbour Board, and payable at the Mersey Docks Office.
X.	Timber.		L. The dues being levied as a whole, the proportion due for a particular lightship cannot be distinguished. The amount levied for the whole for the year 1852 amounted to 5,092 <i>l.</i> 2 <i>s.</i> 3 <i>d.</i> ; Midsummer quarter 1852, 1,476 <i>l.</i> ; 1858, 1,698 <i>l.</i>
XI.	Ninety-six tons.		LI. The expenditure can be distinguished for each ship, and is for Formby lightship:—1852, 1,193 <i>l.</i> 5 <i>s.</i> 10 <i>d.</i> ; 1858, 1,265 <i>l.</i> 5 <i>s.</i> 8 <i>d.</i>
XII.	Mr. Peter Cato, Liverpool, in 1840.		LII. Nil.
XIII.	Aft 8 feet, forward 7 feet.		LIII. Nil.
XIV.	Red.		LIV. Nil.
XV.	A two-masted vessel; ball at the mast head.		LV. Nil.
XVI.	Two masts with lug sails.		LVI. Nil.
XVII.	No lightning conductor.		LVII. Nil.
XVIII.	Moorings, 90 fathoms on each arm, laid N.W. and S.E. Has on board Bower anchors of 12 cwt., and 180 fathoms of 1½ inches Bower cable.		LVIII. By local authorities under the Mersey Docks and Harbour Board.
XIX.	1½-chain without studs. Anchors with four palms of 16 cwt.		LIX. Inspections, monthly.
			LX. Never.
			LXI. Never.
			LXII. Barometer and thermometer.
			LXIII. None. A separate lifeboat establishment is maintained under the same authorities as the floating lights.
			LXIV. Marryat's and local codes of signals are used. A separate telegraph establishment is also maintained.
			LXV. Nil.
			LXVI. Monthly. Two months on board and one on shore.

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- LXVII. A tender for attending on the buoyage and beaconage of the port is maintained.
- LXVIII. Two spare lightships ready for instant service are maintained.
- LXIX. A copy accompanies these returns.

NORTH-WEST LIGHTSHIP.—(SPECIAL RETURN.)

- I. North-west lightship, "Tobin;" moored off the entrance of the Horse Channel, western part of Liverpool Bay.
- II. Depth 7½ fathoms; sand and mud bottom; maximum rate of current 3 knots.
- III. Mersey Docks and Harbour Board, Liverpool.
- IV. Lieutenant M. T. Parks, Royal Navy, Marine Surveyor and Water Bailiff, Liverpool.
- V. Vide Act 53 Geo. III. cap. 156.
- VI. The precise reason cannot be stated at this distance of time, yet seems sufficiently obvious from the position of the vessel in the fairway of the Horse and Helbre Channels.
- VII. Forty-six years.
- VIII. Three lights are exhibited from different masts of the same vessel, at different elevations above the water.
- IX. Length over all 98 feet; breadth, extreme, 21 feet; depth from under side of deck to keelson 10 feet 10 inches.
- X. Iron.
- XI. Two hundred tons.
- XII. Vernon and Son, Liverpool.
- XIII. Forward 7 feet, abaft 8 feet.
- XIV. Black, with white riband.
- XV. A three-masted vessel; black hull with white riband; ball at masthead.
- XVI. Staysails.
- XVII. Nil.
- XVIII. Span moorings laid N.W. and S.E. 90 fathoms, 1½ in.-chain on each arm; 4 palmed 16 cwt. anchors; 2 Bower anchors, Porter's patent 13 cwt.; Bower cables 1½ inches 90 fathoms, and 1½ inches 100 fathoms.

- XIX. Moorings of 1½ inches chain; without studs, anchors 4 palmed, 16 cwt.
- XX. Various; the last chain supplied by H. Wood and Co. of Saltney and Liverpool.
- XXI. Fore 30 feet, main 35 feet, mizen 25 feet.
- XXII. Fore 6½ miles, main 6½ miles, mizen 5½ miles.
- XXIII. Fore 10½ miles, main 11½ miles, mizen 10½ miles.
- XXIV. Fixed. In addition to the masthead lights, blue lights are burnt every two hours of darkness.
- XXV. Nil.
- XXVI. Sunset to sunrise throughout the year.
- XXVII. Catoptric.
- XXVIII. Eight burners in each lantern.
- XXIX. Nil.
- XXX. De Ville and Co., Strand, London.
- XXXI. Hoisted by chain ties, purchase, and winch.
- XXXII. Bell and gong alternately.
- XXXIII. Forty-five days. } These numbers include fogs of very short duration, and are not intended to convey the idea that 45 days of fog existed.
- XXXIV. Forty-five days. }
- XXXV. 2,850*l*.
- XXXVI. 5,194*l*.
- XXXVII. 630*l*.; this sum includes the renewal of moorings, and all ships' store, except oil, salaries, victualling, wicks, and cleaning materials for lighting apparatus. Minor purchases of stores and repairs are effected by the officers of the establishment; larger matters by open tender, as may be required.
- XXXVIII. Two masters and twelve men, of whom one master and seven men are always on board; one man is retained on shore for occasional relief in case of sickness in either ship; the remaining constitute the monthly relief.
- XXXIX. Masters, 110*l*. per annum; seamen, 2*l*. 10*s*. per month.

XL. Victualled by allowance, viz: -

2 masters at 17 <i>s</i> . 6 <i>d</i> .	per week	-	-	£	91	0	0
12 men „ 13 <i>s</i> . 6 <i>d</i> .	„	-	-		421	4	0
					£512	4	0

- XLII. Nil. Vide No. XL.
- XLIII. Chain cable 22*s*. per cwt.; anchors 32*s*. per cwt.
- XLIV. Three lanterns, complete, with lamps, reflectors, &c., at 47*l*. each, 1,42*l*.
- XLV. 1857, 27*l*. 11*s*. 11*d*.; 1858, 33*l*. 9*s*. 1*d*.

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- XLV. Oil, 735 gallons in 1857; 739 gallons in 1858. Wicks, 1,042 in 1857; 1,080 in 1858.
- XLVI. The oil is best refined olive, and the price necessarily varies according to the state of the market, having exceeded at times 6*s*. per gallon. The supply received in May 1858, was at 4*s*. 1*d*. per gallon; in January 1859, 4*s*. 3*d*. per gallon. Taking the mean of these as a present fair average cost, the above years amount to about 154*l*.
- XLVII. The above remark as to price applies again. The description used is cotton tuck wick; last supply 2½*d*. per yard. 1 yard=8 wicks=1*l*. 8*s*. per annum.
- XLVIII. In addition to the bell, a gong is used; cost from 6*l*. to 10*l*.
- XLIX. Floating light dues are levied by the Mersey Docks and Harbour Board, and are payable at the Mersey Docks Office.
- L. The dues being levied as a whole, the proportion for each particular lightship cannot be distinguished. The income for 1852 was 5,092*l*. 2*s*. 3*d*.; Midsummer quarter 1852, 1,476*l*.; 1858, 1,698*l*.
- LI. The expenditure for each lightship can be distinguished, and for this station is, for the year 1852, 1,864*l*. 10*s*. 2*d*. and 1858, 2,076*l*. 19*s*. 9*d*.

- LII. Nil.
- LIII. Nil.
- LIV. Nil.
- LV. Nil.
- LVI. Nil.
- LVII. Nil.
- LVIII. By local authorities under the Mersey Docks and Harbour Board.
- LIX. Inspections are made monthly.
- LX. Never.
- LXI. Never.
- LXII. Barometer and thermometer.
- LXIII. None; a separate lifeboat establishment is maintained under the same authorities as the floating light.
- LXIV. Marryat's and local codes of signals are used. A separate telegraph establishment is maintained.
- LXV. Nil.
- LXVI. Monthly. Two months on board, and one on shore.
- LXVII. A tender, for attending on the buoyage and beaconage of the port, is maintained.
- LXVIII. Two spare lightships ready for instant service are maintained.
- LXIX. A copy accompanies this return.

This vessel was boarded on the 13th of July from Observations the "Vivid," and stands 34 on the list of lights by Commis- sioners. visited or seen alight. She is painted black and white on the outside, and red inside; rides in seven fathoms by two bridles; and, as stated by the master on board, she sometimes has out as much as 90 fathoms of chain on each cable. The chain is hove up quite short once a month. The reflectors in this vessel are peculiar. There are eight in each of the three lanterns fitted to each other by cutting out a segment at the edge, they are consequently fixtures. The lamps also are peculiar in form. Instead of the usual Argand burner, they have a long shaped wick placed parallel to the axis of the parabola. (This arrangement was afterwards seen amongst obsolete inventions in the museum of the French lighthouse authorities.) The reflectors are of a larger size than those usually found on board lightvessels; but it appears as if the rocking of the vessel should throw the light of a fixed system of reflectors alternately above and below the horizon. The supply of oil must also be affected by the motion more than in lamps hung on gimbals, as they are in the lightvessels of the general lighthouse authorities. The reflectors were beautifully clean and very well polished. The lamplighter said that, "it was exceedingly difficult to clean reflectors at sea. Salt water finds its way "everywhere in rough weather, and hardens on the "silver, which it corrodes, and the hard substance "also scratches the silver when it is polished with "the rubbers."

As this vessel near the sand banks, and the Seven Stones, far from land, had the best polished reflectors then seen afloat, and as they were equal in brilliancy to most of those seen on shore, it seems to be possible,

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though difficult, to keep reflectors in good order anywhere at sea.

The vessel is of iron, built in compartments. She is only partially lined with wood. The men said, "She is very cold in winter. In summer, on hot days, one can hardly bear the hand on the inside. Damp also condenses in the inside in certain states of the atmosphere," which is a common result in iron buildings on shore which are not lined. The vessel is not provided with the danger or off-station lights supplied to the floating lights of the Trinity House and Ballast Board. When adrift or off her station, she lowers her ball and hoists a blue flag. She has been very seldom adrift, not for 11 years. The oil was green and thick, but no complaint was made of its quality for burning. The vessel has flag signals. The men have no uniforms. They have no library. No beer or spirits are allowed on board. The amount of wages was correctly stated by the men. The master thinks the vessel should be sharper forward. She has not been cleaned for four years, and her bottom was very foul. (The Commission were afterwards informed that this was done on purpose to prevent rolling.) It was remarked that the gong was cracked, and that the name of the vessel is painted on the quarter in letters which are smaller than those on the Trinity House vessels. She burns blue lights at stated hours, which is not done elsewhere.

On the 14th of July, seven captains of Mr. Mac Iver's ships were examined, and with reference to this vessel stated "that they thought the name should be painted in larger letters, but did not think it of much consequence." They observed that "the lights of the lightvessels *wink*;" but so does "Conibeg" (*which has lamps hung on gimbals*). One is as good as the other. "The Owers and Nab are better." One gentleman considered the Seven Stones the worst he knew. (*The reflectors were the best polished that had been seen afloat.*)

On the same day eight pilots were examined:—

"They have not seen anything wrong; they make the best of the lights, such as they are. There is not much to complain of the North-west lightship, but it should be two or three miles further out to the north-west; but in that case Helbre should have something for coasters. If a lightvessel were placed outside the bell buoy, they would rather that the North-west lightship should remain where she is."

On the same day examined two captains of tug boats, which vessels run as far as Cape Clear, &c:—

They think that "the North-west lightship *'blinks'* rather more than others. The shore lights are seen first. The blue lights burnt on board are very good things."

On the 25th of October, Capt. Baker, captain of a steamer at Bordeaux, stated that he was in favour of placing a lightship instead of the bell buoy.

The breaking adrift of the North-west lightship in 1839 and in 1834 is repeatedly mentioned in the printed answers to Question 6, which shows that this light is much used, and carefully watched by mariners. There are no complaints of the efficiency of this light, and no one of the witnesses who have replied to Question 6 has ever remarked any irregularity in it, except as above.

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BUOYS AND BEACONS.

I. Lieutenant M. T. Parks, Royal Navy, Marine Surveyor and Water Bailiff, Mersey Docks and Harbour Board, Liverpool.

II. The accompanying chart of Liverpool Bay shows all the buoys and beacons under the control of the Board. Its conservancy jurisdiction comprises the whole port of Liverpool, which has been thus defined by the Commissioners of the Treasury, 12th April 1859:—"From the termination of the port

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"of Chester, along the Cheshire shore, and all over the waters of the Mersey, Irwell, and Weaver, and so along the Lancashire shore until it meets the port of Fleetwood, at Hunderd End Water." 65 buoys and floating beacons (not being lightships), and the beacons on shore are maintained. No special dues are levied in respect of them, and no income is derived from them.

III. The Mersey Docks and Harbour Board has sole control over the management of the buoying of the port of Liverpool.

IV. No other authorities are responsible to the Mersey Docks and Harbour Board for the management of buoys and beacons.

V. A drawing of the best description of buoys now in use accompanies these returns, but out of 101 buoys in use only 11 are of that description. The remainder, built at various times, as far back as 1830, differ very much in mould, dimensions, and in their capabilities for more exposed or smooth-water stations. Upon considerations connected with the latter condition they are appropriated, but are too irregular in mould and dimensions to admit of classification upon any given scale of dimensions, &c.

a. Iron buoys are preferred, as cheaper in first cost, more durable, easier to repair, and less liable to loss from collision.

b. The original cost is given on the accompanying drawing for those buoys.

c. The ordinary cost of repairing a buoy cannot be given, because it may sometimes be run down by a steamer several times in a month, and sometimes pass a year without a casualty.

d. For the same reason the cost of painting a single buoy cannot be given.

e, f. The total number of buoys and floating beacons in position is 65, and in reserve (which includes those undergoing repair) is 40.

g. They are kept in the buoy store at Toxteth Dock.

h. With the exception of those actually under repair (usually two or three in number) all are kept in readiness for service, not with moorings attached, but in the chain store adjoining are chains sufficient to moor 80 to 100 buoys, according to the depth of water, and ancillors or sinkers 20 in number.

i. 9 buoys were accidentally displaced in 1858.

j. Two sunk, four stove, two dragged, and one bell beacon capsized, all by collisions with vessels.

k. With single chain and cast-iron sinkers of 12 to 16 hundredweight.

l. The moorings used are worn-out lightships' cables, the original cost of which are 23s. to 25s. per cwt. Their value as worn chain would be in the market about 5s. per cwt. The length of chain varies according to the size and position of the buoy, and cannot therefore be given as a rule for five fathoms.

m. Procured by open tender. Repaired by open tender, or by mechanics attached to the establishment of the board, as may be found most expedient.

n. Buoys are distinguished by colour, red, black, or chequered red and black with white; or by form, man, can, or pillar; or by sound bell. By the initial letters of their channel painted on them with a number. Those situated at elbows or turning points are distinguished by a perch and ball.

o. Two bell beacons are now in position, and all others are distinguished by one or more of the characteristics named.

VI. Herbert's patent buoy for any situation. The patent refers only to the base of the buoy; the superstructure may be any design.

VII. All buoys are brought into port at least once a year.

VIII. The uniform system is, whenever the cost of repair approaches that of a new buoy, to condemn the old and build a new one.

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IX. Beacons are not classified. Two are stone obelisks 90 feet high. One is a stone pillar 60 feet high. The remainder are timber framework, varying from 20 to 80 feet high.

X.	e.	d.	c.	b.	a.	i.	k.
Beacons.	Material.	Means of Illumination.	Purpose.	Date of Erection.	Colour.	Original Cost of Beacon.	Height of Summit above High Water.
N. W. Mark	Timber	Its shape and position.	To lead through the sea channel	Originally a stone tower, removed occasionally, 1718, 1846, 1839.	Black and white.	Unknown.	74
N. W. Beach Mark	do.	do.	do.	do.	Black.	817, 1297.	30
Crosby Beach Mark.	do.	do.	do.	do.	do.	2,000 <i>l</i> .	27
Bootle Obelisk	Bricks and mortar.	do.	To lead through the Rock Channel.	1829.	White and red, striped vertically.		90
Dove Marks, two in number.	Timber	do.	To lead into Hoylake.	Unknown.	Black and white.	100 <i>l</i> .	40
Walton Mark	do.	do.	To lead through the Rock Cut.	Ancient.	do.	estimated, 145 <i>l</i> . when last renewed.	30
Helbre Beach Mark.	do.	do.	To lead through Helbre Swash.	1834.	do.	826 <i>l</i> .	247
Eye Mark	do.	do.	For various cross marks.	1834.	do.	340 <i>l</i> .	55
Grange Mark	Stone	do.	To lead through New Channel.	1840.	Red sandstone.	340 <i>l</i> .	72
Victoria Mark, formerly New Channel Mark.	Timber	do.		1835.	Black.	786 <i>l</i> .	233
							63

- g. None are lighted.
- h. Vide foregoing table.
- i. Vide foregoing table.
- j. The lighthouses, lightships, buoys, beacons, lifeboats, and telegraphs being maintained under one department from a common fund, the total maintenance of each cannot be distinguished where charges, as salaries and attendance, &c., are common to all. The total income and expenditure of the fund for 1858 is here given. Income 19,482*l*; expenditure 17,298*l*.
- k. No income derived.

- XI. It is improbable that any other than Herbert's patent buoy will be built as long as the patentee accords his licence to build here, where the expense is scarcely half that charged for them when built in London.
- XII. Red buoys on the starboard band entering from seaward, black on the port. Can buoys on the starboard hand, nun buoys on the port. Middle patches and neighbouring channels distinguished by chequered or striped painting. Elbow buoys by perch and ball.
- XIII. No such rule applicable to beacons.
- XIV. Light dues paid to the Mersey Docks and Harbour Board at the Dock Offices, Liverpool.
- XV. Light dues paid to the Mersey Docks and Harbour Board, at the Dock Office, Liverpool.

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XVI. No income from buoys and beacons. The income from light dues, from which they are maintained is stated on the lightship and lighthouse returns. The total expenditure cannot be given, because the buoy tender is also a lightship's tender, and being navigated, with the exception of a master and two men, by lightship's men, her expenses are not specially chargeable to buoys. The expense attending repairs only is included in the following figures, viz.:—1852, 73*l*. 9*s*. 1*d*.; 1858, 896*l*. 3*s*. 8*d*.

XVII. The Queen's Channel was buoyed on 22nd September 1854, on the application of the marine surveyor of the Board.

XVIII. The last-named application was submitted in due course to the Trinity House, according to Act 6 & 7 Will. IV, cap. 79, and then carried into effect.

XIX. By authorities appointed by the Mersey Docks and Harbour Board.

XX. Vide No. XXIX.

XXI. Notices are published when requisite.

XXII. The superior and all subordinate authorities are resident in the port.

XXIII. Lightships, lighthouses, and telegraphs communicating any intelligence respecting buoys and beacons by signal to the marine surveyor and water bailiff's office.

XXIV. Nil.

- a. Nil.
- b. Nil.
- c. Nil.
- d. Nil.
- e. Chequered buoys are objected to generally, on account of the difficulty of distinguishing them in the surf which in bad weather breaks over the banks.
- f. Nil.
- g. Nil.
- h, i, j. No dues are collected specially for buoys.
- k. Nil.
- l. Nil.
- m. Nil.

XXV. Herbert's buoys before spoken of are the latest that have been tried. The course adopted for ascertaining their value was that one was ordered from the patentee, moored as fairway buoy of the Queen's Channel, and found to answer the intent of its projector.

XXVI. No printed forms relating to buoys are in use.

XXVII. Some exceptions to the rule stated in answer to No. XII exist, but as opportunity offers these are gradually extinguished, so that all channels leading into this port may be under that rule.

On the 13th of July, a large black buoy was observed marked some miles to windward of the "Vivid," then by Commissioners in the Horn Channel. It was said to be on Herbert's principle, and 18 feet high. It was very visible, in the evening light.

It was observed that the buoys in the Rock and Horn Channel were small, and wanted painting; but that they were arranged on a system—black on one side, red on the other. This channel is not much used by large vessels.

On the 15th of July, the buoy wharf was visited at Liverpool, in company with Mr. Parks, who holds several appointments under the Dock Trustees, besides having care of the lights, buoys, and beacons. The Commissioners were much struck and pleased with a large class of Herbert's buoys, adopted for marking the Queen's Channel, red on one side, black on the other, can-buoys on the one side, nun-buoys on the other. The can-buoys, black, show a cone 14 feet above water, and cost 83*l*. The nun-buoys, red, show a truncated cone, 7 feet 6 inches above water. The outer fair-way buoy, at the entrance of the Queen's Channel, shows 30 feet above the water, and rides to a 16 cvt. sinker. As a proof of the steadiness of Herbert's principle, this buoy is said to be too steady to ring the bell properly. Buoys were also seen identical with Poulter's buoys, 25 years old. Mr. Parks thinks that these only ride well in more than 5 fathoms, where the weight of chain acts as ballast.

The Board continue to use and repair many old-fashioned buoys from motives of economy. Mr.

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Parks would prefer Herbert's buoys. With reference to general system, he admitted the difficulty of carrying out systematic buoyage (say) on the east coast of Ireland, where long banks with narrow swashways extend along the coast. The swashways leading to no harbour. He suggested that the east-most buoys should be distinguished by COLOUR and SHAPE from the west-most. All Liverpool buoys are NUMBERED and LETTERED.

On the 15th, the buoys in the Queen's Channel were observed from the "Vivid," which passed close alongside of them at dusk. They were watching well, upright in the tide, oscillating very little, distinct in character and colour, and easily seen. They had been down eight months, and were the best buoys seen up to that date (no better buoys have been seen anywhere since that date). There was quite sea enough to make a badly constructed buoy oscillate considerably, but the bell-buoy appeared like the rest, to rise and fall with the sea with little oscillation. It has been run into and stove, but being made in compartments, it did not sink.

On the 15th of July, 7 captains of Mr. MacIver's steamers, were examined. They all considered the buoys in Queen's Channel very good, and that the principle, viz., SHAPE and COLOUR different on different sides should be made universal. (*In Dublin and in Liverpool the systems differ. Under the Trinity House there is no system. In Scotland there is colour only. In Hull the colour is reversed.*) All consider the buoys in Crosby Channel too small and too far apart. All wished the bell buoy to remain, if a lightvessel is placed outside. With regard to general systems, one thought that the difficulty mentioned above, might be met by directing that the TIDE be taken as the rule. *Against the ebb, black on port side; against flood red on port side.*

On the same day 8 pilots were examined. They all considered the buoys in Queen's Channel very good. "They watch well, heed rather from the tide; " the bell-buoy is not so good as the old; it is a "mere nominal thing (that is for ringing the bell); " it was upset in March, the sea upset it, but it "righted again before night. The big buoys are admirable in a gale of wind." All wish a light vessel placed instead of the bell buoy. All the other pilots are of this opinion also. They formed the opinion "long ago; they have held it for years, but never pressed it. It is everybody's business, and none liked to be first to complain."

"They think the buoys in Crosby Channel well enough. BLACK is the colour which all can see best on the water, and a BLACK flag against the sky. "Blue Peter is seen much further, three times further than the Trinity flag, half red half white, horizontal, "which they now use."

(This evidence, as to colour, has been confirmed by the Mariners' Evidence.—See Abstract, p. 586.)

40. LOWESTOFT.

LOWESTOFT.

LIGHTHOUSE.—(SPECIAL RETURN.)

Circular III.

There are two red lights on the outer pier heads, lighted with oil. The lighthouses are wood erections.

Also two green lights on the inner pier heads. These are gas pillars, and gas used in lighting. These lights are fixed, and exhibited from dark to daylight.

The expense of keeping these lights is borne by the "Eastern Counties Railway Company," the lessees of said harbour.

See lights on annexed plan.

Circular V.

BUOYS AND BEACONS.

This return not applicable to Lowestoft Harbour, there being no buoys or beacons under the jurisdiction of the "Eastern Counties Railway Company," lessees of said harbour.

41. LYME REGIS.

LYME

Circular

Lyme Regis, June 20, 1859.

Sir, Borough of Lyme Regis.

In reply to your communication of the 4th instant requesting the Corporation of this borough to furnish replies to queries made by the Commission of Lights, Buoys, and Beacons, I beg to inform you that there are no buoys or beacons near this harbour under the control of the Corporation.

There is no lighthouse at this port. Two lamps are erected, one at the extremity of the Victoria Pier, at the cobb or harbour, and the other at the Custom House, lit with gas, for the convenience of vessels entering the port by night. They are maintained at the expense of the Corporation, and cost about 35*l.* per annum.

If the above information be not sufficient for the purposes of the Commission I shall be happy to render any more detailed information which may be in my power to afford.

I have, &c.

J. F. Campbell, Esq.
&c. &c.ROBT. W. HILLMAN,
Cobb Clerk.

42. KING'S LYNN.

Circular

BUOYS AND BEACONS.

- I. The Corporation of King's Lynn, who are the conservators of the port and harbour.
- II. A chart showing these particulars accompanies this return.
- III. It is not.
- IV. There are none.
- V. A drawing of the buoys accompanies this report, with a statement annexed.
- (See statement annexed to sketch of buoys.)
- VI. The elongated nun buoy.
- VII. Six months.
- VIII. The beaconer and pilots regularly and continually inspect the positions and state of repair of the buoys, which are repaired and replaced as occasion requires.
- IX. See accompanying drawings.
- X. See statement annexed to sketch of beacons.
- XI. Ten long nun buoys have recently replaced others as being more suitable.
- XII. By surveying through the channel, shifting and replacing the buoys. The system pursued is that of placing all white buoys on the starboard side on entering the port and the black buoys on the port side. The beacons are placed on both sides of the channel.
- XIV., XV. The corporation levy and collect under the name of town dues, beaconage, stakage, anchorage, hallastage, bulkbreak, and lastage. Beaconage is made chargeable with the cost of maintaining the buoys (300*l.* per annum paid to the beaconer as before stated) and with the repair of the beacons. The balance of the collection of the town dues is carried to the borough fund account.
- XVI. Total income for buoys and beacons, Midsummer quarters, 1852, 191*l.* 4*s.* 10*d.*; 1858, 228*l.* 16*s.* 5*d.*; total income for 1852, 861*l.* 5*s.* 6*d.* Total expenditure for 1852, 364*l.* 15*s.*; 1858, 335*l.* 14*s.* 5*d.*
- XVII. None made since 1853 for either buoys or beacons. The last application was made to the corporation in 1851 by the beaconer, to erect a beacon on Lloyd's Middle Sand, which was then erected as before stated.
- XVIII. None made.
- XIX. By the beaconer half yearly.
- XX. By the beaconer half yearly.
- XXI. By printed notices when necessary.
- XXII. Yes.
- XXIII. The pilots navigate through the channel every night, and report any casualties to the pilot master, and he reports to the mayor.—N.B. The beaconer and buoy master is also pilot master.
- XXIV. None made.
- XXV. In some cases the long nun buoy has been substituted for the flat-headed buoy.
- XXVI. The corporation issue no regulations, but leave the inspection and entire management of the buoys and beacons to their officer the beaconer.

43. MALDON.

LIGHTHOUSE.—(SPECIAL RETURN.)

There is no lighthouse under the management or control of the Corporation, of the Mayor, Aldermen, and Burgesses of the Borough of Maldon. They have, therefore, no return to make to the inquiries contained in this paper.

BUOYS AND BEACONS.

I. The Mayor, Aldermen, and Burgesses of the Borough of Maldon, Maldon, Essex.

II. See chart annexed, which shows all the beacons under the management of this authority. There are no buoys in the river. The costs of maintaining the beacons did not, it is believed, in 1852, or in the year 1858 (during the whole of such years), exceed 20s. per annum. The total number of beacons (as shown by the chart) is nine.

III. No superior authority.

IV. This authority appoints a water-bailiff, who is recently deceased, and the office is consequently at the present moment vacant. Mr. Edward Warren, of Maldon, was the water-bailiff.

V. No noys.

VI. No buoys.

VII. No buoys.

VIII. No buoys.

IX. Not classified.

X. *a.* (1), Thurslet Spit Beacon; (2), Doctors Beacon; (3), Southey Beacon; (4 and 5), The Double Beacons; (6), Ford Creek Beacon; (7), Clarke's Beacon; (8 and 9), Smach Hole Beacons.

b. Been erected from time immemorial, but renewed by new beacons when necessary, on account of damage or otherwise.

c. All erected for guides in navigating the river, and to point out the boundaries of the different shoals of mud.

d. No distinguishing mark for each beacon, but some have a basket at the top, others a bundle of seaweed, &c.

e. Usually a young birch tree, about 20 feet high, embedded in the mud, with a basket or other sign at the top.

f. Not painted.

g. Not lighted.

h. Average six feet.

i. Estimated at 20s. each beacon.

j. Estimated at 20s. a year, all the beacons.

k. No account kept, the late water-bailiff receiving the total income for his own use, subject to his keeping up the beacons, and the amounts were collected by himself. The average receipts are presumed to have been about 15*l.* or 20*l.* a year.

XI. No alteration has been made.

XII. No buoys.

XIII. A beacon is placed at spots considered dangerous to the navigation without it, on account of the mud shoals.

XIV. No buoys.

XV. As before stated, the water bailiff has collected the beaconage, and out of his receipt maintained the beacons. The small craft, not requiring a pilot, pay beaconage.

XVI. As before stated, no regular account kept, and not ascertainable, through the death of the water bailiff, but probably from 15*l.* to 20*l.* a year; it is not likely to have varied materially in 1858 from 1852.

XVII., XVIII. No such applications.

XIX. No buoys.

XX. Not inspected for many years.

XXI. No buoys. If the beacons get injured or out of position, the Trinity pilots or others give information to the water-bailiff; and he is in the habit frequently of going down the river to see that the beacons are in proper order.

XXII. No. See last answer.

XXIII. The water bailiff takes entire charge of the beacons, and no report is made to this authority, of any accidents, &c.

XXIV. None.

XXV. No alteration made or suggested.

XXVI. None.

XXVII. In consequence of the death of the water-bailiff, the question of the beacons will probably be put on a better footing when his successor is appointed.

44. ISLE OF MAN.

LIGHTHOUSES.—(GENERAL RETURN.)

I. Commissioners appointed under the Act 11 Geo. III. c. 52. Douglas, Isle of Man.

II. There are lighthouses at Douglas Head and Fort Island, Derbyhaven; also at the pier heads of Port St. Mary, Peel, Ramsey, Douglas, and Castletown.

III. Cannot say what these principles may be, none have been stated.

IV. No particular height has been ascertained or commonly known. Douglas Head Light is probably 600 feet lower than the upper light on the Calf of Man. It is considered that in foggy weather the former is seen oftener than the latter.

V. Catoptric.

VI. None have been stated.

VII. Fixed.

VIII. None have been stated.

IX. Without any means of getting this done.

X. Not aware to what this refers.

XI. Tow, wicks, glass, leather skins, are purchased when necessary at the several localities, and without any special contract. Oil procured from London and Liverpool in the same manner.

XII. No fog signals in use.

XIII. No tide signals in force.

XIV. None.

XV. No income. Total expenditure about 240*l.* per annum.

XVI. None have been submitted.

XVII. None.

XVIII. None.

ST. MICHAEL'S OR FORT ISLAND LIGHTHOUSE. Circular III.
(SPECIAL RETURN.)

I. St. Michael's or Fort Island, Derbyhaven.

II. Commissioners of Harbours, appointed under 11 Geo. III. cap. 52.

III. James Gell, Esq., J.P., and Deputy Water Bailiff; Robert Thomas Quayle, Esq., Merchant.

IV. One light.

V. Unknown.

VI. Unknown.

VII. None has been stated.

VIII. Unknown.

IX. Mr. Robert Cain, Builder; Mr. James Gelling, Douglas, Engineer.

X. Harbour light.

XI. Wood, painted white.

XII. None.

XIII. Twenty feet.

XIV. Fifty feet.

XV. Ten to twelve miles.

XVI. Eight to ten miles.

XVII. Cannot answer.

XVIII. Fixed white light.

XIX. Refer to XVIII.

XX. Dusk to daylight, throughout the year.

XXI. Catoptric.

XXII. Three.

XXIII. Apparatus improved in 1854, at the instance of the resident Commissioners.

XXIV. Mr. James Gelling, Douglas.

XXV. Through the top.

XXVI. None.

XXVII. Refer to XXVI.

XXVIII. No register kept.

XXIX. About 20*l.* Built on an old fort.

XXX. Finished.

XXXI. Eight feet by five. Cost probably 7*l.*

XXXII. Not purchased.

XXXIII. About 15s.

XXXIV. About 15s.

XXXV. One keeper; salary 12*l.*

XXXVI. Refer to XXXI.

XXXVII. About 30s. per annum.

XXXVIII. About 60 gallons each year.

XXXIX. Best pale seal oil, from 2*s.* 9*d.* to 3*s.*

XL. Coarse cotton wick, cost about 10s. per annum.

XLI. None.

XLII. Fund in the hands of the Commissioners of Harbours, under Act 8 & 9 Vict. cap. 94.

XLIII. The light is free.

XLIV. About 13*l.* for each year.

XLV. None. Refer to XLII and XLIII.

XLVI. As before.

XLVII. As before.

XLVIII. None.

XLIX. None.

ISLE OF MAN.

- ISLE OF MAN.
Circular III. L. Commissioners of Harbours, Isle of Man.
LI. May.
LII. No.
LIII. There is some spare machinery. Oil at store near the lighthouse.
LIV. None.
LV. None.
LVI. None.
LVII. Not relieved. One keeper lives in Derbyhaven, near to lighthouse.
LVIII. No printed rules.

BUOYS AND BEACONS.

- Circular V. I. The Commissioners of Harbours of the Isle of Man constituted by Act 11 Geo. III. cap. 52.
II. No buoys or beacons.

CASTLETOWN LIGHTHOUSE.—(SPECIAL RETURN.)

- Circular III. I. Pierhead light, Castletown.
II. Commissioners of Harbours appointed by Act 11 Geo. III. cap. 52.
III. James Gell, Esq., J.P., and Deputy Water Bailiff; Robert Thomas Quayle, Esq., Merchant.
IV. One light.
V. Unknown.
VI. Unknown.
VII. None has been stated.
VIII. Unknown.
IX. Mr. Robert Cain, Builder; Mr. James Gelling, Engineer.
X. Harbour light.
XI. Carboniferous limestone; colour of the stone, blue.
XII. None.
XIII. Twenty-five feet.
XIV. Thirty-five feet.
XV. Five to seven miles.
XVI. Five to seven miles.
XVII. Cannot answer.
XVIII. Fixed red light.
XIX. Refer to XVIII.
XX. Dusk to daylight.
XXI. Catoptric.
XXII. Two burners.
XXIII. Apparatus improved in 1849, and patent oil used at the suggestion of the Receiver-General.
XXIV. Mr. James Gelling, Douglas.
XXV. Through the top.
XXVI. None.
XXVII. Refer to XXVI.
XXVIII. No register kept.
XXIX. Cost of lighthouse about 100*l*. No adjoining building.
XXX. Finished.
XXXI. No lantern. Reflectors and lamps used. Cost, probably 8*l*.
XXXII. Not purchased.
XXXIII. Nil.
XXXIV. Nil.
XXXV. One keeper; 5*l*. 10*s*. per annum.
XXXVI. Refer to XXXI.
XXXVII. About 4*l*. per annum.
XXXVIII. About 90 gallons each year.
XXXIX. Patent oil; price per gallon from 3*s*. 6*d*. to 4*s*.
XL. Coarse cotton wicks. Cost about 10*s*. per annum.
XLI. None.
XLII. Fund in the hands of the Commissioners of Harbours under Act 8 & 9 Vict. cap. 94.
XLIII. The light is free.
XLIV. About 22*l*. 10*s*. for each year.
XLV. Refer to XLII. and XLIII.
XLVI. Refer as before.
XLVII. Refer as before.
XLVIII. None.
XLIX. None.
L. The Commissioners of Harbours of the Isle of Man.
LI. October.
LII. No.
LIII. One spare lamp. Lower room.
LIV. None.
LV. None.
LVI. None.
LVII. The harbour master is also lightkeeper; lives near the pier.
LVIII. There are no printed rules. Instructions verbal.

BUOYS AND BEACONS.

- Circular V. I. The Commissioners of Harbours of the Isle of Man, constituted by Act 11 Geo. III. cap. 52.

ISLE OF MAN.

- ISLE OF MAN. Circular
II. One buoy in Castletown bay, about one mile and half from the pierhead, moored near the east end of the Lheachroo rock, which is covered at two-hours flood. One beacon, situated on Langness Point, the S.E. headland. No income is derived. Supported by the Harbour Commissioners without any charge on vessels.
III. The Lords Commissioners of Her Majesty's Treasury.
IV. The harbour masters at the several ports of the island. James Mylechreest, Harbour Master, Castletown.
V. About eight feet long and five feet in the widest part.
a. Oak.
b. From 10*l*. to 12*l*.
c. About 3*l*. per annum.
d. About 16*s*.
e. One.
f. None.
g. None.
h. None.
i. None.
j. No displacement.
k. Single anchor and chain.
l. From 10*l*. to 12*l*.
m. Not by tender.
n. It is a large black buoy.
o. Refer to former answer.
VI. No information.
VII. One year.
VIII. Examined and repaired when required.
IX. One beacon on Langness Point, about two miles from Castletown pierhead.
X. Refer to former answer.
a. The landmark.
b. Year 1820.
c. As a mark for the lowland of Langness point.
d. None but observation.
e. The slate rock of the locality.
f. White.
g. Not lighted.
h. Three hundred feet.
i. No means of ascertaining.
j. Nil.
k. None. Refer to answer to No. II.
XI. No information.
XII. Not aware of any. Buoy is placed where it is considered it may be useful.
XIII. Refer to XII.
XIV. Fund applicable to the maintenance of the buoys of the island under Act 8 & 9 Vict. cap. 94.
XV. Refer to XIV.
XVI. None. Free.
XVII. None.
XVIII. No.
XIX. By the harbour master in the summer of each year.
XX. Same as last.
XXI. Notice to masters of vessels in the harbour.
XXII. Yes.
XXIII. The harbour master informs the Commissioners.
XXIV. None.
XXV. None have been tried.
XXVI. None.

DOUGLAS HEAD LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Douglas Head Lighthouse, Douglas.
II. Commissioners of Harbours, appointed by Act 11 Geo. III. cap. 52.
III. Richard Quirk, Receiver General; D. Williams, Collector of Customs; W. F. Moore, Merchant.
IV. Irrespective of Douglas Head light, there are six port lights for lighting vessels in the bays and into the harbours of the island, viz., Douglas, Derbyhaven, Castletown, Port St. Mary, Peel, and Ramsey, and are maintained by the Commissioners without any charge on vessels.
V. 1826.
VI. The shipping interest of the port.
VII. None has been stated.
VIII. Year 1832.
IX. Thomas Brine, Builder and Engineer; not built by contract.
X. Channel light.
XI. Slate rock of the locality in which the lighthouse is situated. Has inner and outer wall. Plastered joints.
XII. None.
XIII. Sixty-two feet.
XIV. One hundred and four feet.
XV. Fifteen miles.
XVI. Eighteen to twenty miles.

- OF MAN. ISLE OF MAN.
- lar III. XVII. Cannot answer.
 XVIII. Fixed white light.
 XIX. Refer to XVIII.
 XX. Dusk to daylight.
 XXI. Catoptric.
 XXII. Eight burners.
 XXIII. No alteration of importance since the lighthouse was first erected. In 1845, Capt. Washington, R.N., suggested the use of patent oil instead of sperm, and which was adopted.
 XXIV. Messrs. Wilkins and Co., London.
 XXV. Through the top by air pipes.
 XXVI. None.
 XXVII. Refer to XXVI.
 XXVIII. No register kept.
 XXIX. About 2,500*l*.
 XXX. Finished in year 1833.
 XXXI. Lantern 10 feet diameter and 10 feet high. If price of lantern is meant to include reflectors and machinery with it, the cost was about 1,000*l*.
 XXXII. Not purchased.
 XXXIII. About 20*s*.
 XXXIV. From 8*l*. to 10*l*. per annum. Painted annually by contract. Some years by day work.
 XXXV. One keeper. Salary 32*l*. per annum.
 XXXVI. Refer to XXXI.
 XXXVII. About 8*l*. per annum.
 XXXVIII. About 430 gallons each year.
 XXXIX. Patent oil (Colza), price per gallon in 1857 and 1858 from 3*s*. 6*d*. to 4*s*.
 XL. Coarse cotton wicks. Cost about 30*s*. per annum.
 XLI. None used.
 XLII. From funds in the hands of the Commissioners of Harbours under the Act 8 & 9 Vict. cap. 94.
 XLIII. The light is free to all vessels.
 XLIV. From 140*l*. to 150*l*. per annum.
 XLV. Refer to XLII and XLIII.
 XLVI. Refer as before.
 XLVII. Refer as before.
 XLVIII. None.
 XLIX. None.
 L. The Commissioners of Harbours of this island.
 LI. October 1857 and 1858.
 LII. No.
 LIII. Two spare lamps. Lower room.
 LIV. None.
 LV. None.
 LVI. None.
 LVII. A man and his wife keep the lighthouse; not relieved.
 LVIII. There are no printed rules and regulations. The instructions are verbal.
- This light stands No. 42 on the list of lights visited or seen aight. It was observed burning brightly on the night of the 15th of July, at about 2 a.m. from the "Vivid," at a considerable distance.
- BUOYS AND BEACONS.
- I. The Commissioners of Harbours of the Isle of Man, constituted by Act II Geo. III. cap. 52.
 II. One buoy at Douglas used for warping vessels out of harbour with on-shore winds. One beacon on Douglas Head. No income derived. Supported by Commissioners without any charge on vessels.
 III. The Lords Commissioners of Her Majesty's Treasury.
 IV. The harbour master at the several parts of the island. John Clague, Harbour Master, Douglas; Robert Gelling, Assistant.
 V. 7 feet long, 3½ feet in widest part.
 a. Oak.
 b. 10*l*.
 c. 20*s*.
 d. 20*s*.
 e. One.
 f. One in reserve.
 g. One in store.
 h. One.
 i. None.
 j. No displacement.
 k. Double anchor.
 l. From 12*l*. to 15*l*.
 m. Not by tender.
 n. None.
 o. One.
 VI. No information on the subject.
 VII. One year.
 VIII. Examination. No particular system.
 IX. Not classified.

- ISLE OF MAN. ISLE OF MAN. ISLE OF MAN.
- X. One on Douglas Head.
 a. Land mark.
 b. 1825.
 c. A mark for Douglas Head, the harbour being close to.
 d. None but observation.
 e. Slate rock.
 f. White.
 g. Not lighted.
 h. About 500 feet.
 i. Unknown.
 j. Nil.
 k. None.
 XI. No substitution.
 XII. Not aware of any except that of being useful to vessels.
 XIII. Refer to XII.
 XIV. Fund applicable to the maintenance of the harbours under Act 8 & 9 Vict. c. 94.
 XV. Refer to XII.
 XVI. No income. Free to vessels.
 XVII. None.
 XVIII. No.
 XIX. By harbour master in May of each year.
 XX. Same as last.
 XXI. Buoy immediately replaced.
 XXII. Yes.
 XXIII. The harbour master informs the Commissioners.
 XXIV. None.
 XXV. None have been tried.
 XXVI. None.

PORT OF PEEL.

PIER HEAD LIGHTHOUSE.—(SPECIAL RETURN.) Circular III.

- I. Pier Head Light, Peel.
 II. Commissioners of Harbours constituted by Act II Geo. III. cap. 52.
 III. Robert Moore, Esq., J.P., and Deputy Water Bailiff; Henry Graves, Merchant.
 IV. One light.
 V. Unknown.
 VI. Unknown.
 VII. None has been stated.
 VIII. Unknown.
 IX. Builder unknown; Engineer, Mr. James Gelling, Douglas.
 X. Harbour light.
 XI. The lighthouse is of wood painted white.
 XII. None.
 XIII. Fifteen feet.
 XIV. Twenty-two feet.
 XV. Ten to twelve miles.
 XVI. Seven miles.
 XVII. Cannot answer.
 XVIII. Fixed white light.
 XIX. Refer to XVIII.
 XX. Dusk to daylight.
 XXI. Catoptric.
 XXII. Two burners.
 XXIII. Apparatus improved in 1849, and patent oil used at the suggestion of the Receiver General.
 XXIV. Mr. James Gelling, Douglas.
 XXV. Through the top.
 XXVI. None.
 XXVII. Refer to XXVI.
 XXVIII. No register kept.
 XXIX. Cost of lighthouse about 30*l*.; no adjoining building.
 XXX. Finished.
 XXXI. No lantern; reflectors and lamps used; cost, probably 8*l*.
 XXXII. Not purchased.
 XXXIII. About 10*s*. per annum.
 XXXIV. About 20*s*. per annum; coated annually; not by contract.
 XXXV. One keeper; 5*l*. 10*s*. per annum.
 XXXVI. Refer to XXXI.
 XXXVII. About 30*s*. per annum.
 XXXVIII. About 100 gallons each year.
 XXXIX. Patent oil, price per gallon from 3*s*. 6*d*. to 4*s*.
 XL. Coarse cotton wicks; cost about 10*s*. per annum.
 XLI. None.
 XLII. Fund in the hands of Commissioners of Harbours under Act 8 & 9 Vict. cap. 94.
 XLIII. The light is free.
 XLIV. About 20*l*. in each year.
 XLV. Refer to XLII and XLIII.
 XLVI. As before.

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- Circular III.
- XLVII. As before.
 - XLVIII. None.
 - XLIX. None.
 - L. The Commissioners of Harbours of the island.
 - LI. September.
 - LII. No.
 - LIII. One spare lamp, lower room.
 - LIV. None.
 - LV. None.
 - LVI. None.
 - LVII. Not relieved. The lightkeeper lives in the town of Peel, and close to the pier.
 - LVIII. There are no printed rules. Instructions verbal.

Circular V.

BUOYS AND BEACONS.

- I. The Commissioners of Harbours of the Isle of Man, constituted by Act 11 Geo. III. cap. 52.
- II. One buoy in Peel Bay, moored a short distance from the pier head, used for warping vessels out of harbour with on-shore winds. No income derived; supported by Commissioners, without any charge on vessels. No beacon.
- III. The Lords Commissioners of Her Majesty's Treasury.
- IV. The harbour masters at the several ports of the island. Robert Kermish, Harbour Master, Peel.
- V. About 6 feet long, and 3 feet in widest part.
 - a. Oak.
 - b. From 8*l.* to 10*l.*
 - c. About 15*s.*
 - d. About 15*s.*
 - e. One.
 - f. None.
 - g. None.
 - h. None.
 - i. None.
 - j. No displacement.
 - k. Single anchor and chain.
 - l. From 10*l.* to 12*l.*
 - m. Not by tender.
 - n. Not intended or required as a mark for vessels.
 - o. Refer to former answer.
- VI. No information on the subject.
- VII. One year.
- VIII. Examined and repaired when required.
- IX. None at Peel.
- X. Refer to IX.
- XI. Cannot say.
- XII. Here it is unnecessary to buoy channels, harbours, or rivers.
- XIII. No beacon.
- XIV. Fund applicable to the maintenance of the harbours under the Act 8 & 9 Vict. cap. 94.
- XV. Refer to XIII.
- XVI. No income. Free to vessels.
- XVII. None.
- XVIII. No.
- XIX. By the harbour master in the summer of each year.
- XX. Refer to XIII.
- XXI. Notice to masters of vessels in the harbour.
- XXII. Yes.
- XXIII. The harbour master informs the Commissioners.
- XXIV. None.
- XXV. None have been tried.
- XXVI. None.
- XXVII. The attention of the Commissioners will be called to the preparation of a spare buoy.

Circular III.

PORT OF RAMSEY.

RAMSEY LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Pier Head Light, Ramsey.
- II. Commissioners of Harbours, appointed by Act 11 Geo. III. cap. 52.
- III. William Callister, J.P., Deputy Water Bailiff; and James Carlett, Esq.
- IV. One light.
- V. Unknown.
- VI. Unknown.
- VII. None has been stated.
- VIII. Unknown.
- IX. Mr. John Timperley, Builder; Mr. James Gelling, Douglas, Engineer. By contract.
- X. Harbour light.
- XI. Slate rock of the district, colour of the stone.
- XII. None.
- XIII. Thirty feet.

ISLE OF MAN.

- XIV. Forty-five feet.
- XV. Ten to twelve miles.
- XVI. Five to seven miles.
- XVII. Cannot answer.
- XVIII. Fixed red light.
- XIX. Refer to XVIII.
- XX. Dusk to daylight.
- XXI. Catoptric.
- XXII. Two.
- XXIII. Apparatus improved in 1850, and patent oil used at suggestion of the Receiver General.
- XXIV. Mr. James Gelling, Douglas.
- XXV. Through the top.
- XXVI. None.
- XXVII. Refer to XXVI.
- XXVIII. No register kept.
- XXIX. Cost of lighthouse about 50*l.* No adjoining building.
- XXX. Finished.
- XXXI. No lantern. Reflectors and lamps used. Cost probably 8*l.*
- XXXII. Not purchased.
- XXXIII. Nil.
- XXXIV. Nil.
- XXXV. One keeper, 6*l.* 10*s.* 8*d.* per annum.
- XXXVI. Refer to XXXI.
- XXXVII. About 4*l.* per annum.
- XXXVIII. About 90 gallons each year.
- XXXIX. Patent oil, 3*s.* 6*d.* to 4*s.* per gallon.
- XL. Coarse cotton wicks; cost about 10*s.* per annum.
- XLI. None.
- XLII. Fund in the hands of the Commissioners of Harbours under Act 8 & 9 Vict. cap. 94.
- XLIII. The light is free.
- XLIV. About 29*l.* 10*s.* for each year.
- XLV. Refer to XLII and XLIII.
- XLVI. As before.
- XLVII. As before.
- XLVIII. None.
- XLIX. None.
- L. Commissioners of Harbour, Isle of Man.
- LI. May.
- LII. No.
- LIII. One spare lamp; oil at lighthouse.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. One keeper, who lives in the town near to the pier.
- LVIII. No printed rules; verbal instructions.

BUOYS AND BEACONS.

- I. The Commissioners of Harbours of the Isle of Man, constituted by Act 11 Geo. III. cap. 52.
- Buoys and beacons have not been required at the port, and there are none.

PORT ST. MARY.

PIER HEAD LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Pier Head Light, Port St. Mary.
- II. Commissioners of Harbours, constituted by Act 11 Geo. III. cap. 52.
- III. James Gell, Esq., J.P., and Deputy Water Bailiff Robert Quayle, Esq., Merchant.
- IV. One light.
- V. 1817.
- VI. Unknown.
- VII. Pier Head.
- VIII. Unknown.
- IX. Builder unknown. Engineer unknown.
- X. Harbour light.
- XI. Limestone. Whitewashed yearly. Top of wood painted white.
- XII. None.
- XIII. Twenty-seven feet.
- XIV. About 35 feet.
- XV. About four miles.
- XVI. About four miles.
- XVII. Cannot answer.
- XVIII. Fixed white light.
- XIX. Refer to XVIII.
- XX. Dusk to daylight.
- XXI. One lamp, one reflector.
- XXII. One burner.
- XXIII. No alteration since 1845.
- XXIV. Unknown.

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ISLE OF MAN.

- MAN.
r III.
- XXV. Through the top.
 - XXVI. None.
 - XXVII. Refer to XXVI.
 - XXVIII. No register kept.
 - XXIX. Cost of lighthouse about 50*l*. No adjoining building.
 - XXX. Finished.
 - XXXI. Unknown.
 - XXXII. Not purchased.
 - XXXIII. Nil.
 - XXXIV. About 15*s*. yearly.
 - XXXV. One keeper, 4*l*. 4*s*. per annum.
 - XXXIV. Unknown.
 - XXXVII. About 5*s*. per annum.
 - XXXVIII. About 30 gallons each year.
 - XXXIX. Pale seal oil. Price per gallon 3*s*. to 3*s*. 6*d*.
 - XL. Coarse cotton wicks. Cost about 8*s*. per annum.
 - XLI. None.
 - XLII. Fund in the hand of the Commissioners of Harbours, under Act 8 & 9 Vict. cap. 94.
 - XLIII. None, the light is free.
 - XLIV. About 10*l*. for each year.
 - XLV. Refer to XLII. and XLIII.
 - XLVI. Refer as before.
 - XLVII. Refer as before.
 - XLVIII. None.
 - XLIX. None.
 - L. By the local commissioners.
 - LI. In the summer.
 - LII. No.
 - LIII. Spare burner. Lower room.
 - LIV. None.
 - LV. None.
 - LVI. None.
 - LVII. The harbour master, who is also lightkeeper, lives near the pier.
 - LVIII. Instructions verbal.

BUOYS AND BEACONS.

- ar V.
- I. The Commissioners of Harbours of the Isle of Man. Constituted by Act 11 Geo. III. cap. 52.
 - II. No buoys or beacons.

LLOYD'S EVIDENCE.

- ar VI.
- I. Rob. Bourdman, agent for Lloyd's and the Underwriters of Liverpool, Glasgow, Douglas, Isle of Man.
 - II. DOUGLAS.
 - III. Commissioners of Harbour of the Isle of Man.
 - IV. Yes, for several miles.
 - V. It does not appear that any improvement or alteration is required nearer than Langness Point, seven miles south.
 - VI. Langness is much in want of a light; particulars will appear in the report from Castletown.
 - VII. Oil.
 - VIII. I believe the lights have not been extinguished, accidentally or otherwise, nor do I know of any accident having ever occurred by reason of lights.
 - IX. There is a buoy in Douglas Bay, which has occasionally been taken in for repair, and a reserve one put in its place—no accident has occurred.
 - X. No accident has occurred nearer than Langness, seven miles off.
 - XI. None in use. I am not aware of any complaint having been made, or to tide signals having been required.
 - XII. During fogs a small gun is used, and occasionally a gong, but only by the Steam Packet Company for their own vessels.
 - XIII. The buoy in Douglas Bay is coloured red, form conical—the beacon on Douglas Head white.
 - XIV. No.
 - XV. None.
 - XVI. None to my knowledge.
 - XVII. Satisfactory, except the want of a light at Langness, seven miles south.
 - XVIII. Refer to XV.
 - XIX. Refer as above.
 - XX. I believe the management is satisfactory.—Having had occasion lately to have visited Port St. Mary, owing to several wrecks, I find there is great want in Port St. Mary Bay of a beacon or point to be placed on the Carrick rock, about the centre of the bay, and extends far across. It is covered at four hours flood, and this makes it more dangerous. This bay is frequented for shelter by

II.

X x

ISLE OF MAN and MARYPORT.

ISLE OF MAN.
Circular VI.

vessels in distress, lately by the "Ohio," from Liverpool, and became a total wreck. In the fishing season the whole fleet of boats visit it, and a great number of strangers to purchase fish.—Douglas, December 28.

- I. James Bunnan, Ballasalla, Isle of Man, Secretary to the Lieutenant-Governor of the Island, Hon. Secretary to the Castletown branch of the Royal National Life Boat Institution.

II CASTLETOWN.

- III. The Isle of Man Harbour Commissioners.
- IV. No.
- VI. A lighthouse, with fog bell on Langness Point. 1st, because is low lying and dangerous peninsula, on which perhaps more wrecks than on any other point of the island, past which the tide rushes at times at the rate of five miles an hour. 2ndly, because the lights on the Calf of Man, under the Northern Light Commissioners, are frequently capped (especially in foggy weather, very frequent on this coast) from their elevated situation. 3dly, because it is the principal resort of a very large fleet of fishing boats from England, Ireland, and Scotland, as well as of the Manx fleet during the herring fishing season. 4thly, it is in the immediate track of the colliers from Cumberland to Dublin, &c.

VII. Oil.

VIII. No.

IX. No.

X. There have been several almost every year; three during the last six months. H.M.S. "Racehorse" was lost at Langness Point about 40 years since.

XI. None.

XII. None. A fog bell on Langness Point is very much required.

XIII. There is a black can buoy in Castletown Bay to the eastward of the Shearline rock.

XIV. No.

XV. None.

XVI. I am not aware of any.

XVII. Satisfactory.

XVIII. There are no dues.

XX. Satisfactory.

- I. The within information is obtained from Capt. Henry Gill of this town, for many years master of large vessels out of Liverpool, and formerly harbour master of this port.

III. Harbour Commissioners.

IV. A light very much required at Langness Point.

VI. On Langness Point several vessels have been lost for want of a light, including the sloop of war, "Racehorse," several years back, and as well as several small vessels last few years. The steam packet "Mona Queen" was very near lost a short time back, on her passage from Dublin, getting on shore in Castletown Bay near Langness.

VII. Oil.

X. As above, Langness.

45. MARYPORT.

MARYPORT.
Circular II.

Harbour Office, Maryport,
May 24, 1859.

MARYPORT is situate about 5 miles N.E. of Workington. It is easy of access, and entirely free from sand banks, and has a capacious dock in which vessels are kept constantly afloat, as well as its original tidal harbour and basin. Depth of water in ordinary spring tides 21 feet 6 inches; neap tides, 13 feet 6 inches; or, by adding 3 feet to the water show in Holden's Liverpool, and the Manx tide tables, a near approximation for each tide will be obtained.

A fixed bright light is exhibited on the outer pier head all night, and another on the inner stone pier, whilst there are 8 feet of water in the harbour; a red ball near the inner lighthouse denotes 8 feet in the daytime; both lights are on the starboard side in entering, and are visible at sea from E.N.E. to W.S.W. at a distance of 12 miles. The jetty on the south side is distinguished by a red light, and the north tongue by a green one.

A chain is sunk within the entrance of the south wooden pier to bring up vessels in case of need.

MARYPORT.

MARYPORT AND NEATH.

Circular II.

Powerful steam tugs are in readiness every tide and when required by vessels entering the harbour at night two lights must be shown one above the other; or by day a union jack at the main.

There is good anchorage in stiff clay, about $1\frac{1}{2}$ miles off shore, the outer lighthouse bearing S.E.

Rails are laid along the quays forming a direct railway communication to all parts of the United Kingdom.

Circular III. MARYPORT LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Maryport.
- II. None.
- III. Trustees of the harbour.
- IV. Tidal light on the inner stone pier, and sea light 248 yards to the north-west, on the extremity of the outer south extension wooden pier.
- V. None.
- VI. For convenience of vessels entering the harbour.
- IX. Built by the trustees of the harbour.
- X. Sea light and tidal or harbour light.
- XI. Tidal light, cast iron with stone base, colour white. Sea light lantern on a post.
- XII. Not so.
- XIII. Tidal light 35½ feet. Sea light, no vane.
- XIV. Tidal light 52 feet; sea light 19 feet 3 inches.
- XV. Twenty miles.
- XVI. Fifteen miles.
- XVII. Fixed bright lights.
- XX. Tidal light during the time there is 8 feet of water in the harbour, and sea light from sunset to sunrise.
- XXI. Tidal light, catadioptric, of the fourth order, to illuminate 270°, with plated silver reflector for 90° of 25' radius.
- XXII. Tidal light, fourth order, Argand burner. Sea light, 3 jets.
- XXIII. March 1858. New apparatus for tidal light at suggestion of harbour engineer.
- XXIV. Chance Brothers and Co., Birmingham.
- XXV. Openings in the lantern.
- XXVI., XXVII., XXVIII. No fog signals.
- XXXVI. 107*l*. 16*s*. 9*d*.
- XXXVIII. Gas used for both lights.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. None.
- LII. No.
- LIV. A red ball is shown near the tidal light in the day, and the tidal light in the night while there is 8 feet of water in the harbour.

BUOYS AND BEACONS.

(There are no buoys or beacons.)

46. NEATH.

BUOYS AND BEACONS.

- I. Sub-Commissioners of pilotage for the port of Neath.
- II. See plan annexed coloured blue. The total number of buoys is 10. There are no beacons.
- III. Not that they are aware of.
- IV. There are none.
- V. They are not classified, but are numbered from 1 to 4, and are designated by a perch, and 5 not numbered.
 - a. Iron.
 - b. *Sl*.
 - c. They have not been repaired for years.
 - d. 2*l*. 2*s*. for the whole.
 - e. Ten.
 - f. Four.
 - g. Kept at the harbour stores, Britonferry.
 - h. Four.
 - i. Four were removed, and replaced immediately.
 - j. Bad weather and heavy ground swell.
 - k. The buoys are fastened to an inch chain moored in stone.
 - l. This is done by the harbour men in constant employ.
 - m. Not done by tender, but left in the hands of the harbour master.

NEATH AND NEWBIGGIN BY THE SEA.

NEA
Circul

- n. The buoys are painted black on one side and red on the other, and are thus identified. One buoy has a perch to identify it.
- o. Ten.
- VI. Pear shape.
- VII. There are no maximum periods, but the harbour master is continually watching them.
- VIII. None.
- IX. None.
- X. None.
- XI. The same we have for use this many years.
- XII. Our channels are buoyed under the direction of the harbour master, and altered as required, being a shifting bar.
- XIII. No.
- XIV. There are no tolls paid. The buoys are maintained by harbour tolls or dues.
- XV. None.
- XVI. There are no tolls levied for buoys in this port.
- XVII. None.
- XVIII. None.
- XIX. Inspected by the harbour master regularly.
- XX. None.
- XXI. By means of the pilots and hoblers.
- XXII. Yes, the harbour master.
- XXIII. The harbour master replaces and reports to the Harbour Commissioner.
- XXIV. None.
 - a. Chain and stone.
 - b. Iron.
 - c. Pearshape.
 - d. Seven feet by four diameter.
 - e. Black and red.
 - f. None.
 - g. None.
 - h. None.
 - i. None.
 - j. None.
 - k, l, m. Done under the superintendence of the harbour master, and as the circumstances require it.
- XXV. None.
- XXVI. None.
- XXVII. None.

LLOYD'S EVIDENCE.

Circu

- I. Wm. Lowther, harbour master for the port of Neath.
- II. NEATH.
- III. Harbour master for the time being.
- IV. No.
- VI. A lightship at the west end of the Skirneathers, and three buoys on the patches of the green ground instead of one.
- VII. Oil. Many vessels have been lost on the Skirneathers; that might have been saved had a light been there.
- XIII. Red and black.
- XV. No.
- XXVII. The want of the light and buoys described on the other side.
- XX. No.

47. NEWBIGGIN-BY-THE-SEA.

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Circu

LLOYD'S EVIDENCE.

- I. William Dawson, of Newbiggin-by-the-Sea, in the county of Northumberland, fisherman.
- II. NEWBIGGIN-BY-THE-SEA aforesaid, a village in the parish of Woodhorn, occupied principally by fishermen.
- III. Trinity Board, Newcastle-upon-Tyne.
- IV. Newbiggin-by-the-Sea is not lighted; it lies about 10 miles north from Tynemouth Lighthouse, and about 10 miles south from Coquet Lighthouse; Tynemouth and Coquet are well lighted.
- V. There are no buoys or beacons.
- VI. Newbiggin Point is a very proper place for an additional lighthouse as vessels frequently come on shore during foggy weather.
- VII. Oil is used at the Coquet Lighthouse.
- VIII. No accident has occurred.
- IX. The buoys at the Coquet Island occasionally have been displaced, and afterwards replaced, but I am unable to state the time and am not aware that any accident ever occurred in consequence thereof.

NEWBIGGIN-BY-THE-SEA and NEWCASTLE.

- X. The schooner Comely, of Inverkeithing, William McCulloch, master, came on shore entirely owing to the want of a lighthouse on Newbiggin Point.
- XI. No signals used or required.
- XII. Fog signals are occasionally used at Newbiggin Point during the herring season; they consist of an iron lamp lighted with coals, and raised about 20 feet above the level of the sea.
- XIII. No buoys or beacons used.
- XIV. None levied.
- XV. Not known.
- XVI. Not known.
- XVII. Not known.
- XVIII. Not known.
- XIX. Not known.
- XX. Not known.

NEWCASTLE-UPON-TYNE.

- VIII. 1810, in the present lighthouses.
- IX. Messrs. Henderson and Bolton, contractors for part; various others were employed.
- X. Harbour (leading) tide light.
- XI. Solid; stone, coated with white lead round the top and side next the sea, the other three sides with stone coloured paint.
- XII. No.
- XIII. 60 feet 5 inches.
- XIV. 126 feet 9 inches.
- XV. Thirteen miles.
- XVI. Fourteen miles with the low light.
- XVII. 61° 52' S.E. $\frac{1}{2}$ E. to E.N.E., the latter extreme over the land.
- XVIII. A fixed bright light, not coloured.
- XIX. Nil.
- XX. From first quarter flood to first quarter ebb. See Low Light Return.
- XXI. A single (silvered) parabolic reflector.
- XXII. One burner.
- XXIII. None.
- XXIV. A common chimney from fireplace, with a funnel from the light into the chimney, assisted, if required by an outer door less or more opened.
- XXV. A bell as a return signal to low light keeper only.
- XXVI. Not noted.
- XXVII. Seven days.
- XXVIII. 1,200*l.* cost of both lighthouses.
- XXIX. Finished.
- XXX. No lantern.
- XXXI. Not purchased.
- XXXII. Average annual cost for repairs for both lighthouses from 1st January 1853 to 31st December 1857, 110*l.*
- XXXIII. Average, one coat a year outside; inside when required.
- XXXIV. Two; one at 160*l.*, the other at 75*l.* a year, with house, fire, light, and taxes.
- XXXV. About 110*l.*
- XXXVI. Lighted by gas.
- XXXVII. Sperm when used.
- XXXVIII. None.
- XXXIX. None.
- XL. None.
- XLI. Trinity House, Newcastle Light Fund.
- XLII. See Low Lighthouse Return.
- XLIII. None.
- XLIV. None.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. The Master and Brethren of the Trinity House, Newcastle.
- LI. 8th June 1857 and 31st May 1858, and various other times throughout each year.
- LII. No.
- LIII. Two spare lamps and one burner; a spare reflector and sperm oil kept in the lightroom.
- LIV. Barometer and thermometer.
- LV. A blue (tide) flag is hoisted in the daytime at first quarter flood on a flagstaff 154 feet above high water, and kept flying till first quarter ebb.
- LVI. See Low Light Return.
- LVII. Every day at 9 a.m.
- LVIII. See Low Light Returns.

48. NEWCASTLE-UPON-TYNE.

LIGHTHOUSES.—(GENERAL RETURN.)

- I. The Master and Brethren of the Trinity House, Newcastle-upon-Tyne.
- II. Low Lighthouse and High Lighthouse, North Shields.
- III. The most convenient that could be procured.
- IV. The height regulated by local circumstances.
- V. A single (silvered) parabolic reflector.
- VI. Best suited for a tidal light in this locality
- VII. Fixed.
- VIII. To distinguish it from Tynemouth Light, which is revolving.
- IX. Drawing is sent herewith.
- XI. None.
- XII. No fog signals.
- XIII. No code of tide signals used, except one flag, which is hoisted during tide time.
- XIV. None.
- XV. Income and expenditure:—

—	1845.	1846.	1847.	1848.	1849.	1850.	1851.	1852.	1853.	1854.	1855.	1856.	1857.	1858.
Income	£ 1,885	£ 1,934	£ 2,039	£ 2,214	£ 1,833	£ 1,631	£ 2,007	£ 2,084	£ 1,851	£ 2,160	£ 2,024	£ 1,947	£ 2,072	£ 2,163
Expenditure	1,132	1,273	1,339	1,333	1,168	1,146	1,179	1,825	1,539	1,408	1,538	1,791	1,797	1,616

- XVI. Careful consideration.
- XVII. None.
- XVIII. See Special Returns.

On the 30th of July, the Commission, in the "Vivid," ran up the Tyne to Newcastle, landed and called at the office of the Trinity Board, saw the secretary and returned, as the tide was falling; ran for Sunderland, and got into dock just in time.

The lights were visited on the 9th of December 1859 by Captain Ryder and stand 137 and 138 on the list of lights visited or seen alight. A number of witnesses were examined, who praised the lights. They appeared to be well kept. The system of tide lights in connexion with the lighthouses is efficient and well managed. In order to secure the simultaneous exhibition of two lights placed in different buildings, the keeper of the lower light signals with a coloured light to the keeper in the upper light, and, when his signal is answered, he withdraws a shutter and unmask his light, while the other does the same.

No fault of any kind was found with the lights, buoys, or beacons under this jurisdiction, or with the dues levied in respect of them, by any of the persons who were questioned on the spot.

HIGH LIGHTHOUSE.—(SPECIAL RETURN.)

- I. High Lighthouse, North Shields.
- II. The Master and Brethren of the Trinity House, Newcastle-upon-Tyne.
- III. George Henzell, High Lighthouse, North Shields.
- IV. Two lights bearing E. $\frac{3}{4}$ S. and W. $\frac{3}{4}$ N. from each other by compass 234 yards apart.
- V. In 1536, licence granted by King Henry VIII., to build two light towers.
- VI. Unknown.
- VII. The most convenient that could be procured for leading lights into the harbour, to replace the above old lighthouses.

LOW LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Low Lighthouse, North Shields.
- II. The Master and Brethren of the Trinity House, Newcastle-upon-Tyne.
- III. Francis A. Pattison, Low Lighthouse Keeper, North Shields.
- IV. Two lights bearing E. $\frac{3}{4}$ S. and W. $\frac{3}{4}$ N. from each other by compass, 234 yards apart.
- V. In 1536 licence granted by King Henry VIII. to build two light towers.
- VI. Unknown.
- VII. The most convenient that could be procured for leading lights into the harbour to replace the above old lighthouses.
- VIII. 1810, in the present lighthouses.
- IX. Messrs. Henderson and Bolton, contracted for part, various others were employed.
- X. Harbour (leading) tide lights.
- XI. Solid stone coated with white lead round the top and side next the sea, the other three sides with stone coloured paint.
- XII. No.
- XIII. Eighty-six feet.

- NEWCASTLE-UPON-TYNE.
- Circular III.
- XIV. Eighty feet.
 XV. About 10½ miles.
 XVI. Fourteen miles.
 XVII. 56° 15' S.E. & E. to E. by N. ½ N., the latter extreme partly over the land.
 XVIII. A fixed bright light, not coloured.
 XIX. None.
 XX. From first quarter flood to first quarter ebb, with discretionary power to the principal lightkeeper to extend the latter time in case of need.
 XXI. A single (silvred) parabolic reflector.
 XXII. One burner.
 XXIII. None.
 XXV. A common chimney from fireplace, with a separate funnel for the light, assisted, in case of need, by an outer door less or more opened.
 XXVI. A ball as a signal to the high lightkeeper only.
 XXVII. Not noted.
 XXVIII. Seventeen.
 XXIX. About 12,000*l.* for both lighthouses.
 XXX. Finished.
 XXXI. No lantern.
 XXXII. Not purchased.
 XXXIII. For both lighthouses from 1st January 1853 to 31st December 1857, 110*l.*
 XXXIV. One coat a year outside; inside when required.
 XXXV. Two, one at 200*l.* and the other at 80*l.* a year, with house, fire, light, and taxes.
 XXXVII. About 10*l.* a year.
 XXXVIII. Lighted by gas.
 XXXIX. Sperm when used.
 XL. Round wick.
 XLI. None.
 XLII. Trinity House, Newcastle, Light Fund.
 XLIII. Midsummer quarter 1852, 534*l.* 10*s.* 4*d.*; Midsummer quarter 1858, 586*l.* 15*s.* 3*d.*; 1852, 2,082*l.* 5*s.* 1*d.*
 XLIV. 1852, 81,25*l.* 16*s.* 11*d.*; 1858, 1,616*l.* 13*s.* 3*d.*
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. The Master and Brethren of the Trinity House.
 LI. 8th June 1857 and 31st May 1858, and various other times throughout each year.
 LII. No.
 LIII. Two spare lamps and one burner. A spare reflector and sperm oil kept in the lightroom.
 LIV. Barometer and thermometer.
 LV. A blue (tide) flag is hoisted at the High lighthouse in the daytime at first quarter flood on a flagstaff 154 feet above high water, and kept flying till first quarter ebb. A tide gauge with an illuminated dial at the top of the west side of this lighthouse shows towards the harbour a close approximation to the water on the bar, day and night, during tidal time.
 LVI. None; no signals are used except the lights or tidal flag, which is not hoisted except when vessels may enter the harbour in safety; any other flags or signals might tend to mislead vessels in the offing.
 LVII. Every day at 9 a.m.
 LVIII. For the regulations as to the lighting of the two lights, see No. XX. in this return, and for the time for hoisting a flag, see No. LV. in both this return and the High Lighthouse return. Instructions to the following effect are given, viz.:—That the lighthouse keepers and their assistants shall keep a regular watch during the time the lights are burning, as well as when the flag is flying; that the keeper of each lighthouse and his assistant shall attend their respective lighthouses from 9 a.m. one day until 9 a.m. the following day, each taking his regular turn.
- NEWCASTLE-UPON-TYNE.
- NEWCASTLE-UPON-TYNE.
- g. Coast buoys at Shields, river buoys at Newcastle.
 h. Fifteen.
 i. One only displaced, but they are frequently damaged by vessels striking them.
 j. Heavy seas.
 k. Chain and metal sinkers.
 m. Open tender.
 n. Painted, either chequered, or red, or black.
 o. Seventeen.
- VI. Iron or wood nun buoys for the coast, and spar buoys for the rivers.
 VII. Six months.
 VIII. Under constant care of inspector, who sends in a monthly report.
 IX. Not classified.
 X.
 a. Five at Holy Island; five at mouth of Tyne.
 b. Different times.
 c. At Holy Island, two in the law leading from the sea to the harbour; one on Emanuel Head, a seamark; one on Plough Seat Rock, to clear said danger; one in the Island a leading mark with Church Tower, to lead into the Harbour. Five buoys into the Tyne, all leading into Harbour.
 d. Painted, either red, or white, or black.
 e. Brick, stone, and timber.
 f. Varied.
 g. Not lighted.
 h. All of different but commanding heights.
- XI. To the fullest extent.
 XIV. From dues payable by shipping, through a collector, and received by the Trinity House.
 XV. From dues payable by shipping, through a collector, and received by the Trinity House.
 XVI.

Total Income.						Total Expenditure.			
Midsummer Quarter 1852.		Midsummer Quarter 1858.		Year 1852.		1852.		1858.	
£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
396	1 9	469	9 2	1,448	9 3	901	18 5	1,573	1 1

- XVII. Nil.
 XVIII. Nil.
 XIX. The Inspector, monthly.
 XX. The Inspector, monthly.
 XXI. Advertising in Shipping Gazette and local papers.
 XXII. The inspector with steamboat at his command for the purpose.
 XXIII. Persons specially appointed in the localities to telegraph immediately, with full particulars.
 XXIV. None.
 m. Complaint was made in 1857 at the delay in replacing the Plough Seat Beacon; the cause was a continuance of heavy gales, and the rock being covered by an hour's flood.

An answer given to that effect.

- XXV. The River Tyne Commissioners requested us to place a more visible distinguishing mark on one of the two buoys at the mouth of the River Tyne, which is now being done by placing a skeleton ball on the top of the buoy, on the north side of the entrance into the harbour.

LOYD'S EVIDENCE.

- I. James and B. G. Sinclair, Lloyd's agents, Berwick.
 II. HOLY ISLAND.
 III. Trinity House, Newcastle, have control of the buoys and beacons. There are no lights.
 IV. Not sufficiently lighted.
 V. We would suggest that there be leading lights into Holy Island; but do not consider there is any necessity for improvement on the buoys and guiding beacons.
 VI. We would have the leading beacons converted into lighthouses, which could be done at very small expense, and also two lights placed on the "Look Out," at Holy Island, which would be of great service to vessels, enabling them to take the harbour at night time.
 VII. No lights.
 VIII. Inapplicable.

BUOYS AND BEACONS.

- I. Master and Brethren of the Trinity House, Newcastle.
 II. See Return, question No. XVI.
 III. No.
 IV. The inspector appointed by the Trinity House is Mr. Thomas Elder, Newcastle.
 V.
 a. Some of wood, others of iron.
 b. From 25*l.* to 35*l.*
 c. Uncertain.
 d. Uncertain.
 e. Ten on the coast, and seven in the River Tyne.
 f. Nine coast buoys and six river buoys.

Circular V.

Circular

NEWCASTLE-UPON-TYNE AND NEWHAVEN.

- ASTLE-TYNE. IX. Buoys, if displaced by a storm, are put right at first opportunity.
- ar VI. X. Vessels do not attempt to take the harbour at night, but run further on, and may in stormy weather very often be lost before they can reach a safe harbour.
- XI. There are no tide signals; but if the harbour had leading lights, they might be lighted at half flood, and would answer the same purpose.
- XII. Do not think they are required.
- XIII. Buoys coloured black on the outer shoals, and red on the inner; beacons painted red.
- XIV. No.
- XV. Fairway buoys 1s., present to Collector of Customs, Berwick.
- XVI. Know of none.
- XVII. Many shipmasters have suggested that the leading lights referred to would be of immense advantage to coasting vessels.
- XIX. We believe so.
- XX. The harbour-master of Holy Island and numbers of the fishermen agree with us in the above statements. No fault can be found with the management as far as it goes. We would also suggest that the Inner Fern light should be shifted to the Mess-stone Rock, in which position it would form a much better guide through the fairway, than it at present is. But as we understand this has come under the notice of surveyors no doubt it will shortly be amended.
- ar VI. I. Ralph Wilson, ruler of pilots, Holy Island.
 II. HOLY ISLAND.
 III. The buoys are under the control of the Trinity House, Newcastle.
 IV. Sufficiently buoyed and beacons, but insufficiently lighted.
 V. Four leading lights into Holy Island Harbour, enable vessels to come in during night.
 VII. There are none.
 VIII. Inapplicable.
 XI. A blue flag is hoisted by the pilotmaster in stormy weather, when the pilots dare not go outside the bar when he considers vessels may safely take the harbour.
 XIII. Black on the outer shoals, and red on the inner.
 XIV. No.
 XVII. Several masters of vessels have expressed their wish for leading lights into Holy Island Harbour.
 XIX. Do not know.

49. NEWHAVEN.

BUOYS AND BEACONS.

- I. William Stevens, Harbour-master.
- V. a. Wood.
 b. About 6l.
 c. About 5l.
 d. About 1l.
 e. One or two.
 h. One or two.
 k. Anchor and chain.
 h. About 25 feet.
- X. XIV. By the harbour dues.
 XXII. Yes.
 XXIV. About 6 feet long.
 XXVI. Only one warping buoy belonging to the harbour; no beacons.

PART OF THE BYELAWS OF THE TRUSTEES OF NEWHAVEN HARBOUR AND OUSE LOWER NAVIGATION.

Regulation respecting Signals.

To take effect on and from the 30th day of September 1847.

There shall be exhibited on the western pier, nightly,

NEWHAVEN—NEWPORT—PADSTOW.

NEWHAVEN.

from sunset to sunrise, a high white light; and in addition during certain periods, a low light, or other signal, viz:

<i>During the under mentioned depths of water at the harbour's mouth, whether flood or ebb.</i>	Day signals.	Night signals.
Thirteen feet and upwards.	A red flag -	A low white light
Ten feet and upwards, and not 13.	Two black balls	A low red light
Eight feet and upwards, and not 10.	One black ball	—

Note.—See Vol. I. for remarks by Dr. Gladstone.

50. NEWPORT.

BUOYS AND BEACONS

- I. The Mayor, Aldermen, and Burgesses of the borough of Newport, in the Isle of Wight, Conservators of Cowes harbour and the river Medina.
- II. There is no chart. There are two buoys and three posts for moorings. The buoys are painted black and red, and are very much out of repair. One of them is sunk, and the other is not worth repairing.
- V. a. Wood with iron hoops.
 c. 5l. was the cost of repairing the buoy last year.
 d. Not been painted, only tarred over, for 4s. each.
 e. Two.
 f. None.
 k. The buoys are moored by means of two anchors, with a bridle.
 m. Repaired by a tradesman.
 n. None.
- XIV. The Corporation of Newport.

51. PADSTOW.

BUOYS AND BEACONS.

- I. S. W. Davey, Harbour Master, Padstow, authorized by an Act of Parliament passed in the 7th and 8th year of the reign of her present Majesty Queen Victoria.
- II. Chart sent herewith.
- III. None but the above.
- IV. None.
- V. No buoys.
 j. No cause.
 k. No mooring.
 l. No cost.
 m. No tenders or cost.
 n. No special means.
 o. None.
- VI. Do not know.
- VII. No period.
- VIII. No surveying.
- IX. No classification.
- X. a. None.
 b. No erection.
 c. No purpose.
 d. No identification.
 e. None used.
 f. No colour.
 g. No light.
 h. None.
 i. No cost.
 j. No cost.
 k. No income.
- XI. Not ascertained.
- XII. No principle adopted as to buoying.
- XIII. No beacon.
- XIV. No buoys, or any fund applied to that purpose.
- XV. No beacons, or any fund applied to that purpose.
- XVI. No income or charge.
- XVII. No applications.
- XVIII. No applications.
- XIX. None to inspect.
- XX. No one.
- XXI. None required.

PADSTOW.	PADSTOW AND PENZANCE.	PENZANCE.	PENZANCE.
Circular V.	XXII. None to replace. XXIII. None. XXIV. None. XXV. There was a beacon, 40 feet high, half a mile westward of Stepper Point, and other works erected about the year 1830, voluntarily by a number of humane persons, to preserve life and property from shipwreck, from which there is no charge unless they receive material service, which the Commissioners under the Padstow Harbour Act can exercise no authority, and by which shipping are not otherwise charged, and these works are still perfect.	XXI. Dioptric? XXII. 5th order. XXIII. 1st August 1855. Altered from a common Argand lamp by the local authority, with the sanction of the general authority. XXIV. Wilkins, London. XXV. Perforated ball, revolving with the vane. XXVI. None. XXIX. The cast-iron column cost 31 <i>8</i> l. No cost of buildings or site. XXX. Finished. XXXI. The lantern is 5 feet 6 inches in diameter, and the price was 291 <i>l.</i> 16 <i>s.</i> 2 <i>d.</i> , including the items here mentioned, and the cost of articles mentioned in No. XXXVI. XXXIII. None. XXXIV. Painted annually by contract, at a cost of about 8 <i>l.</i> XXXV. One at 15 <i>s.</i> per week. XXXVI. Included in answer to No. XXXI. XXXVII. 5 <i>l.</i> XXXVIII. Oil in these two years, 168 gallons, or 84 per annum; wicks 5 yards, or 8 ounces annually. XXXIX. Principally Colza, price 5 <i>s.</i> per gallon. XL. Cotton, 6 <i>d.</i> per yard, 2 <i>s.</i> 6 <i>d.</i> per year. XLII. Corporate revenue of Penzance. XLIII. No income receivable from the light. XLIV. 1852, about 40 <i>l.</i> 1858, about 70 <i>l.</i> XLV. No dues applicable to the light. XLVI. See No. XLV. XLVII. Ditto. XLVIII. None. XLIX. None. X. Not officially inspected by any one but the officers of the local authority.	Circular
Circular VI.	LLOYD'S EVIDENCE.		
	I. Tremain and Clemow, merchants, agents for Lloyd's. II. PADSTOW. III. The Trinity House for lights; no buoys. The Padstow Harbour Association, for a beacon half a mile to the westward of the entrance of the harbour. IV. A harbour light would be very serviceable, and two or three mooring buoys are wanted. V. Black buoys, three in number, were formerly placed in the channel, but funds to maintain them became exhausted. VI. The placing of lights for the harbour must be decided by a scientific person, but the buoys for leading vessels on entering the port should be on the edge of the Dunbar Sands. VII. The Trinity House can give this information as to Trevoze Head Light, which is the only one near. VIII. Not aware of anything wrong as to the Trevoze Light. IX. The buoys have gone adrift many years past, and the private fund could not replace them. X. Impossible to give an opinion; vessels have been lost, but the cause is not so certain. XI. No tide signals used; a harbour light would answer the purpose best. XII. Not wanted, as there is very little. XIII. There are none. XV. None levied. XVI. No complaints have been made that we are aware of. XVII. The Trevoze Head Light is a first class one, very good, and found to be most valuable. XVIII. There are none. XIX. None collected. XX. No complaints made about Trevoze Light.		

July 7, 1859.—Steamed into Mounts Bay. Observed the beacons on the rocks near Penzance, which were in the places indicated by the charts and easily seen. They were perch beams, with stays coloured black and red.

Landed Mr. Gladstone, who was obliged to return to London. His report on Penzance Light follows.

At Penzance, Mr. Gladstone found Mr. John Mathews, surveyor, who takes much interest in the lighthouse. He stated that he had given some information for the special return of the lighthouse, and imagined that it had been sent to the Commission. He promised to inquire respecting the delay. Five years ago the lighthouse was a very poor one, the light being exhibited from a wooden shed (still standing) at the end of the pier. The pier, however, has been lengthened, and a neat stone lighthouse erected at its extremity; it is painted white; dioptric, 5th order; shows white in one direction, red in another. Colza oil is now burnt, except in stormy weather in winter, when sperm oil is used, the reason being that the lamp will hold only 14 hours' supply of Colza oil, but enough sperm oil to last a very long night, thus dispensing with a visit of the keeper during the night, which, indeed, is often almost impracticable on account of the breaking of the sea over the pier.

The Corporation of Penzance has a black pole as a beacon, and the warping buoys in the harbour.

PENZANCE.	52. PENZANCE.	BUOYS AND BEACONS.	Circular
Circular III.	LIGHTHOUSE.—(SPECIAL RETURN.)		
	I. The Penzance Pier Head Lighthouse, at Penzance, Cornwall. II. The Honourable the Corporation of the Trinity House. III. The Mayor, Aldermen, and Burgesses of Penzance. IV. One only. V. No record found of any application, but light supposed to have been first exhibited in 1817, in pursuance of the power contained in the Local Pier Act passed in that year. VI. See answer to No. V. VII. To indicate the entrance to the harbour. VIII. The present improved light was first exhibited on 1st August 1855. An extension of the pier and a new lighthouse at the head of it having been first then completed. IX. Builders, Messrs. Sandys and Co., Ironfounders, Hayle, Cornwall. Engineer, Mr. John Mathews, Penzance, who is surveyor to the local authority. The lighthouse was built by contract. X. Harbour light. XI. Cast-iron column, painted white. XII. No. XIII. Thirty-four feet. XIV. Thirty-three feet three inches. XV. About 14 miles. XVI. About 18 miles. XVII. 80°, ranging from east 15° south to south 5° west. XVIII. Fixed; colour, red when there are 15 feet of water at the pier head, and green when less than that depth. XX. Sunset to sunrise.	I. The Mayor, Aldermen, and Burgesses of the borough of Penzance, in the county of Cornwall. II. See chart herewith of the harbour of Penzance, which is the extent of the jurisdiction, and has no subdivisions. The only buoys are those laid down in the harbour for temporarily mooring and warping vessels, and their positions are shown on the chart by red dots. There are no beacons within the jurisdiction, but outside the harbour there is one, marked on the annexed chart of a portion of Mounts Bay as "Beacon—the Gear," which was erected many years since by the old corporation of Penzance, and has been maintained by the present corporation. The cost of maintaining buoys and moorings in 1852 was 66 <i>l.</i> 0 <i>s.</i> 11 <i>d.</i> , and in 1858,	

PENZANCE.

70l. 12s. 1d. There was no outlay on the beacon referred to in either of those years. There is no income derivable here from buoys or beacons.

III. None.

IV. None.

V. This (diagram) is the only description of buoy in use.

a. Wood (pine) and iron.

b. Sl.

c. The annual cost of keeping the whole of the buoys (25 in number) in repair and replacing old ones is about 70l.

d. (See answer to letter c.) Not painted, but coated with tar.

e. Twenty-five.

f. Four.

g. In a yard adjacent to the harbour.

h. Four.

i. Not known.

k. There are three kinds of moorings used for the buoys, viz.—1. To large granite blocks sunk deep under the surface. 2. To iron spear point piles driven in the ground. 3. To a 2½-inch chain laid across the entrance to the harbour.

l. None in use.

m. We contract for ironwork and provide wood and labour.

n. None.

VI. Only one description used.

VII. They are overhauled twice a year.

VIII. See answer to No. VII.

IX. See answer to No. II.

X.

a. The Gear pole.

b. First erected about the year 1819.

c. To indicate a rock called the Gear Rock.

d. Painted white and red.

e. Twelve feet wood, and 18 feet iron.

f. See letter d.

g. Not lighted.

h. Eighteen feet.

i. Supposed about 150l.

j. None in either of these years.

k. See answer to No. II.

XI. See answer to No. VI.

XII. The buoys are placed in such positions in the harbour as to temporarily moor the vessels in tiers.

XIII. Not applicable.

XIV. Corporate revenue of Penzance.

XV. Same as No. XIV.

XVI. See answer to No. II.

XVII. None.

XVIII. None.

XIX. By the officers of the Corporation.

XX. See answer to No. XIX.

XXI. None necessary.

XXII. Yes; the deputy harbour-master and lightkeeper.

XXIII. See answer to No. III.

XXIV. The moorings and buoys have been materially increased since 1853, and no formal complaints or representations have been received on the subject.

XXV. The classes 2 and 3 of moorings, mentioned in division k of the answers to No. V., are improvements on class 1, which was previously in use.

XXVI. None.

LLOYD'S EVIDENCE.

I. Richard Pearce, Lloyd's agent, sub-commissioner of pilots a magistrate, &c., Penzance.

II. PORT of PENZANCE.

III. Trinity House, London, for beacons on the Wolf Rock, also on the Crossers and Ryeman, between the piers of Penzance and St. Michael's Mount; buoys, near Rundlestone, Mount a Mopus, and Low Lea; lights, Lizard and Longships. Penzance Town Council for beacon on the Gear Rock; light on Penzance pierhead.

IV. See No. V.

V. A lighthouse would be an improvement to the beacon on the Wolf Rock, as would be a bell on the Rundlestone buoy.

VI. See No. V.

VII. Oil.

VIII. I am not aware of any.

IX. None of any note.

X. None that I know of.

XI. At Penzance Pier, when there is 15 feet water at the pierhead, black ball is hoisted by day, and a red

PENZANCE and POOLE.

light is exhibited at night; but, at night, when the water at the pierhead is less than 15 feet, a green light is substituted for the red one; and these coloured lights are so fixed respectively, that, when in sight, they clear vessels from both the Gear, lying south 15 west, and the Ryeman, which lies east 12 south from the pierhead, the Crossers lying further in shore, say east 4 north.

XII. We have none.

XIII. On Wolf Rock, conical beacon, red; on Ryeman, iron pole and basket, black; on Crossers, iron pole and basket, red; on Gear, iron pole and basket, white; buoy, near Rundlestone, black; buoy, near Mount a Mopus, red; buoy, near Low Lea, red.

XIV. See No. V.

XV. None.

XVI. None that I am aware of.

XVII. I have heard of no complaints, but the suggestions to Qu. V., as to Wolf and Rundlestone, have been mentioned.

XVIII. There are no dues levied at Penzance, buoys, beacon, or light; the Trinity House collect for Longships and Lizard.

XIX. There are none levied.

XX. I have heard no complaints. I enclose a chart of the harbour of Penzance, and, on the same sheet, a sketch of part of Mount Bay, from Lamorna to beyond Cuddan; also, a notice to mariners, of 23d October 1857, which will more fully explain my answer to the 11th Query. There are, of course, a great number of mooring and transporting buoys within Penzance pierhead extension.—2d January 1860.

PENZANCE.

Circular VI.

POOLE

Circular V.

53. POOLE.

BUOYS AND BEACONS.

I. The Town Council of the Borough of Poole as Trustees under a local Act passed in the 29th year of the reign of His Majesty George the Second.

II. Cost, 1852	-	-	£281	8	4
„ 1858	-	-	205	8	11
Income, 1852	-	-	315	13	6
„ Midsummer quarter, 1852	-	-	81	2	0
„ Midsummer quarter, 1858	-	-	80	9	0

Number of buoys, 22, viz., 11 red; 9 black; 1 chequered; 1 green on wreck. Number of beacons, 5. A map accompanies this return.

III. None.

IV. None.

V. Not classified or designated.

VI. Can buoys for tideways and nun buoys for exposed channels and coasts.

VII. No fixed period. Examined once in every year.

VIII. Every buoy when brought up is examined.

XI. Not classified.

X. a. Three within harbour lights and two without harbour lights.
b. In the year 1848.
c. For harbour navigation.
d. See Notice to Mariners issued by the Town Clerk.

e. Lamps erected on posts.

f. White.

g. Oil.

h. See Notice.

j. 1852, 107l. 4s.; 1858, 119. 6s.

k. No charge.

XI. Throughout.

XII. Buoys are laid down where found necessary.

XIII. No charge since first erection.

XIV. All collected under the Act is paid into one common fund, from which the buoys are maintained.

XV. See previous answer.

XVI. Income, Midsummer quarter, 1852	-	£81	2	0
„ 1858	-	80	9	0
Total	„	162	13	6
Expenditure, total	„	182	8	4
„ 1858	-	205	8	11

XVII. No applications.

XVIII. No application.

XIX. They are inspected, as before stated, by the harbour master, once in every year.

XX. See last answer.

POOLE.

POOLE.

POOLE.

POOLE.

Circular

Circular V.

XXI. The public are informed by notices issued by the harbour master, and posted at the Harbour Office and the Custom House.

XXII. It is replaced as soon as reported to the harbour master.

XXIII. None.

XXIV. None.

XXV. Peacock's refuge buoy beacon has been tried at the bar. It repeatedly broke from its moorings from the force of wind and tide. It is now placed on the spit sand opposite Branksea Castle, in comparatively smooth water, where it rides well.

XXVI. None issued.

NOTICE TO MARINERS.

Circular II.
Circular V.

Having at the request of the corporation, and in connexion with the lights already established for approaching and entering the port by night, extended the arrangement with additional lights for also navigating the inner part of the harbour from the haven point to the quay, the following directions are offered as a guidance to the understanding and use of them:—

The arrangement consists of three lights,—one near the extreme point of the sandbanks, at the lower part of the roads; one a little to the eastward of the stables, near Stokes's house; and another near Lilliput Farm-house, a little to the westward of Flag-head.

When entering the harbour, almost immediately after rounding the haven point, the light near it will appear, and soon pass behind a screen, touching the north-west side of which will lead to the buoy of the little channel, called Aunt Betty; and just open of the south-east side of it will lead up the main channel upon a N.N.E. $\frac{1}{2}$ E. line, very near to the second and upper red buoys of the middle ground; to be continued until the light to the eastward of the stables touches a screen, when the course must be altered, keeping the light just in sight of the west part of the screen leading about north, until the light near the farmhouse already mentioned is hid, which must be re-opened, and if kept just in sight will lead upon a N.W. by W. $\frac{1}{2}$ W. line, to the southward of Stakes, bringing the two existing red lights in one for leading to the quay. Or, when certain of having reached far enough upon the second line of direction to clear the elbow of the mud a little above the basket boom, the third mark may be brought on with a course two or three points to the westward of north.

If these instructions are carefully attended to, no hesitation need be entertained in proceeding up or down the harbour in the darkest night, so long as the lights can be seen; and should from any accident the third light near the farmhouse not be lit, the line of the second, to the eastward of the stables, followed until the first light, near the point opened to the north-west of its screen, would place a vessel just above the most projecting part of the south mud, from which there would be no great difficulty in proceeding to Poole, by keeping the railway lights, when they can be seen, a little on the starboard bow, or by keeping the westernmost gaslight of the quay somewhat more open. Of course, no difficulty will be found in applying the foregoing directions (reversing their order) for proceeding down the harbour from Poole to Brownsea.

Poole, 18th October 1848.

GEO. L. PARROTT.

HARBOUR OF POOLE.

NOTICE TO MARINERS.

Circular II.
Circular V.

Two lights have just been established by the corporation upon the eastern side of the entrance to Poole Harbour, for the guidance of vessels to the port by night, and they will be exhibited on and after the 17th instant, from sunset to sunrise.

They are placed 350 feet apart, S. $\frac{1}{2}$ E. and N. $\frac{1}{2}$ W. of each other, the lower and southernmost one 16 feet, and the higher one 26 feet above the level of the sea at high water spring-tides. They are intended chiefly to lead through the swash, which has for some time been forming, and is gradually improving in depth over the Hook-sand, with a prospect of becoming the best passage, about half a mile to the eastward of the present main channel at the bar.

This arrangement is adopted because the line of the direction not only leads through the swash, but it also passes just clear of the inner red buoy and all the other dangers on both sides of the channel, to the haven points.

The general depth of water at the swash is already greater than in the channel over the bar, except a very narrow ridge at the outer or southern part, where it is only about seven feet at low spring tides, or three feet less than over the bar.

To enter the harbour by the swash, the lights must be brought in one, bearing N. $\frac{1}{2}$ W., which, as before observed, will also lead clear of all the shoals, into the haven points.

If from circumstances it be necessary to prefer the channel over the bar, the lights will there also be found of service in the following manner:—By standing to the westward from the neighbourhood of the swash, and on reaching the distance of the bar buoy, the lower light will be suddenly hid by a screen, on a bearing of about N. $\frac{1}{2}$ E., which line will lead very close to the bar buoy, only the higher light will then be seen in any part of the channel from the bar buoy, to what is called the Milkmaid's Bank, on the other side.

When round the bar buoy a N.E. by N. course for about half a mile will bring the two lights in one, when they can be kept in that direction, and attended to as before described for passing in by the swashway.

The lights, and these directions, are intended mainly to assist those acquainted with the navigation of the port, and not to encourage strangers to attempt the harbour by night without a pilot; but under circumstances of emergency, when no pilot could be obtained, and when it might be imperative to seek its shelter at all hazards, they would certainly be of great assistance.

The lights are so constructed so as to show over an angle of only two points of the compass—from N. by W. to N. by E., which will assist in preventing their being mistaken for other lights.

Signed on the part of the corporation,

JAMES CHURCHILL, Town Clerk.

8th July 1848.

Harbour and lights at Poole visited by Admiral Hamilton on the 26th August, 1859.

Visited the buoy shed at Poole, accompanied by the clerk to the trustees of the quay.

All the buoys (channel and harbour) taken up once a year for painting.

All chains for mooring buoys taken up once a year (since two years past), to be examined.

The chains are manufactured in Staffordshire, and come with copy of proof certificate.

The size of the chain for the bar buoys is $\frac{3}{8}$ inch, that for the outer red buoy $\frac{5}{8}$ inch.

For the buoys within the harbour $\frac{1}{2}$ inch.

Only one buoy went adrift last winter, viz., at the elbow of the bar; broke the chain.

At the buoy shed found buoys in course of preparation, to be substituted for those needing repair.

No want of attention to the buoy business, but the want of a system very apparent here.

For instance, there were in store painting, or alongside the wharf ready to be floated out, one of the black and one of the red buoys, used respectively for marking the bar and channel leading to Poole Harbour.

The black (or nun buoy) was nearly 10 feet in the stave, whilst the red buoy, (a can buoy,) was only five feet in the stave.

Nun buoys on the east or starboard hand coming in. Can buoys on the west or port side coming in.

The black or nun buoys along the Hook Sand outside Poole Harbour are five feet six inches in the stave.

Buoys for entrance of Suatchway Bay striped vertical red and white.

The shapes or form of the buoys not uniform. Some of the buoys long barrel buoys. The small red buoys a solid section of a spar.

As usual, only one man who thoroughly understands buoy cooerage, or the manufacture of buoys.

Of the five Poole lights two are on the land or harbour side of the sand hills forming Poole Harbour; one on the east shore of the Poole water on the harbour side; and two on the sand hills facing to seaward.

The lanterns or lights are attached to wooden posts or stands, about five and a half feet in height, and are removed at daylight for cleaning and trimming the lamps, &c. The lights on the inner or harbour

POOLE.

side have a very slight elevation above the water, being placed close to the low sandy shore.

Those to seaward derive their altitude from the height of the sand hills, the highest being about 35 or 40 feet above the level of the sea; the lower light about 25 feet.

It was stated to me by one of the Poole pilots who had had charge of a steamer 10 years ago, at that time running regularly between Poole and a port in France, that he generally made the higher lights at a distance of 16 miles off, and that he rose the lower lights a quarter of an hour after making the upper one.

The lamps are the common bulls-eye lamp, with silvered reflectors, manufactured by Miller, Piccadilly. Those to seaward having a lens about nine inches diameter, and having four wicks; those on the harbour or inner side on the same principle, but into smaller lens, and having three wicks.

The lamps were clear and in good order, and apparently carefully attended to. The lightkeeper has certainly enough to do to attend to four of those lights (exclusive of the farmer's, the fifth), in a winter's night; as, including the distance of one lamp from another, he cannot have much less than five miles of shore and sandhill to traverse between the time of lighting and extinguishing the lights.

Richard Stokes, an intelligent fisherman, has charge of the above five lights, including one that is attended to by a neighbouring farmer. In this charge Stokes is assisted by his father-in-law, a superannuated coast-guard man, also an intelligent person.

For his duties Stokes receives a salary of 1*l.* a week. The average consumption of oil is about one and a half gallons per week, at a cost of about 5*s.* per gallon. The oil burned is mixed, rape and sperm. The rape alone was not found to answer.

On the whole, the trustees of the quays, of whom the mayor, John Wills Martin, Esq., is chairman, seem inclined to do the utmost their means will allow for the lighting and buoying the harbour of Poole; but it is evident that those means and their labour would be turned to more account if they were applied to some regularly established system.

LLOYD'S EVIDENCE.

- I. John Neave Penney, ship and commission agent, representing Lloyd's agency on behalf of Messrs. Richard Hoocké Buck, Crosby Square, London.
- II. Town and county of the town of POOLE; harbour.
- III. Town council or trustees of Quay, Poole.
- IV. A light is required on Old Horry Rock, otherwise we have no cause to complain.
- V. None.
- VI. A light to be placed on Old Horry Rock for ships running for Studland Bay or Poole Bay, there being no lights between Portland and the Needles, and several wrecks have occurred from want of such a light (or a light on Durlstone Head would, in part, meet the requirements).
- VII. Oil (sperm) used for the harbour lights.
- VIII. None.
- IX. None.
- X. Our buoys and beacons cannot be kept in better order.
- XI. Do not consider they are required.
- XII. Would suggest a fog signal to be placed on Old Horry Rock in connexion with the light.
- XIII. Red and black.
- XIV. None.
- XV. A small graduating charge; a vessel registering 100 tons pays 7*s.* only.
- XVI. None.
- XVII. Great satisfaction with all.
- XVIII. General satisfaction.
- XIX. Yes.
- XX. Satisfaction.

54. PORTHCAWL.

PORTHCAWL.

Llynvi Valley Railway, Harbour Office,
Porthcawl, Bridgend, Glamorganshire,
May 2, 1859.

Circulars
III., V.

STR, I BEG to return enclosed form, with the designation and address of the Company to which Porthcawl harbour belongs, that being the only question to which I can return a reply, there being neither lights, buoys, or beacons belonging to this port. I will, however, take this opportunity to point out how very desirable it is that a light vessel should be placed at the Scarweather Sands, where so many vessels and valuable lives are lost.

No further back than the 4th February, during the night, the "India," of 500 tons burthen, with a crew of 13 men, besides some passengers, was lost on that sand, and every soul perished, which melancholy occurrence would, in all human probability, have been averted, had there been a light to have guided her clear of this treacherous and bewildering sand.

A buoy on the Fairy Rock, situated about three quarters of a mile to the southward of this port, would also be of great service to vessels, navigating this shore as many strike on it at low tides.

Respectfully begging to call the attention of the Commissioners to these points,

I remain, &c.,
(Signed) D. A. BUCHAN,
Harbour Master.

T. E. Campbell, Esq.,
&c. &c.

BUOYS AND BEACONS.

Circular V.

- I. Llynvi Valley Railway Company, 21 Westbourne Place, Paddington, London.
- II. Have neither lights, buoys, or beacons.
- III. Harbour Office, Porthcawl, Glamorgan.
- IV. 2d May 1859.
- XXVII. A light much required on the Scarweather Sands, as also a buoy on the Fairy Rock.

LLOYD'S EVIDENCE.

Circular VI.

- I. Daniel A. Buchan, harbour master, commander R.N., Beth Cawl, Glamorganshire.
- II. BETH CAWL.
- III. A light is very much needed at the west end of Scarweather; a buoy is very much wanted on a rocky patch known in this locality as Feuly Rock, lying nearly a mile to the north-ward and westward of the Tuskel Beacon.
- IV. I have on several occasions seen this rock dry, and have known many vessels to strike on it whilst waiting for water to enter this port.
- VI. A light on western end of the Scarweather Sand; a buoy on Fairy Rock, for reasons see Nos. IV. and X.
- IX. The Tuskel Beacon fell during the gale of the 26th October last, and the West Nash buoy is now about half a mile to the eastward of its proper position, having drifted during the late gales. Numerous vessels have been lost within the last eleven years, owing, I have no hesitation in saying, to the want of a light at the west end of the Scarweather Sand.
- X. I name several which, as the honorary agent of the Shipwrecked Mariners Society, more immediately came under my notice, and which, from the inquiries I made at the time of the crews, left no doubt in my mind that had there been a light on the Scarweather, the several wrecks would in all probability have been avoided and much valuable life spared. Lost on the Scarweather Sand: Jan. 1856, *Blanche*; March 1857, *Revenue*; Feb. 1858, *Medice* (French barque); Oct. 1858, *Ajax*; July 1859, *Rosset* and another name unknown.
- XIII. None.
- XV. None.
- XVII. The universal opinion is, that a light should have long since been placed at the western end of the Scarweather Sand, and that a more useful one could not be placed in this channel.

55. PORTREATH.

BUOYS AND BEACONS.

- PORTREATH.
PWLLELLI.
RAMSGATE.
Circular V.
- I. Williams's Portreath Company, Portreath, Cornwall.
 - II. No buoys or beacons.

56. PWLLELLI.

BUOYS AND BEACONS.

- PWLLELLI.
Circular V.
- I. The Mayor, Aldermen, and Burgesses of the Borough of Pwllheli.
 - II. There are no buoys or beacons under the management of the Corporation.

57. RAMSGATE.

LIGHTHOUSE.—(SPECIAL RETURN.)

- RAMSGATE.
Circular III.
- I. Royal Harbour of Ramsgate.
 - II. Trustees of the Royal Harbour, No. 22, Austin Friars, London.
 - III. Francis Shaw, Acting Harbour Master.
 - IV. One tide light.
 - V. Unknown.
 - VI. Unknown.
 - VII. For a tide light.
 - VIII. Unknown.
 - IX. Built by John Shaw, Architect; not by contract.
 - X. Dioptric harbour light, fourth class.
 - XI. Built of granite, single wall.
 - XII. Not fitted with lightning conductors.
 - XIII. 37 feet 7 inches.
 - XIV. 39 feet 5 inches.
 - XV. At times about 14 miles, depending on state of atmosphere.
 - XVI. In a clear night from 8 to 10 miles.
 - XVII. About 197°, from about N.E. $\frac{3}{4}$ E. to about W.S.W. $\frac{1}{4}$ W.
 - XVIII. Fixed light; red when 10 feet between the piers, green light when less water.
 - XIX. Not applicable.
 - XX. Red or green light at all times during the night.
 - XXI. Dioptric, fourth class.
 - XXII. One burner, with two circular wicks, one within the other.
 - XXIII. The present light was shown early in 1845.
 - XXIV. Wilkins and Co., Long Acre.
 - XXV. From roof in lantern and in tower.
 - XXVI. None.
 - XXVII. Not applicable.
 - XXVIII. Not applicable.
 - XXIX. The cost entered into the general expenditure for works of maintenance and improvement. No separate account was kept. The granite was contracted for at about 2s. 3d. per cubic foot delivered to the required dimensions. The labour was performed by the pier workmen at convenient times.
 - XXX. Built in the years 1842 and 1843.
 - XXXI. Height of lantern 10 feet 5 inches, width 8 feet 7 inches. Decagon. The whole apparatus costs 315l. 9s. 4d.
 - XXXII. Belonging to the harbour.
 - XXXIII. None.
 - XXXIV. About 15s. annually; work done by the lighthouse keepers.
 - XXXV. Two keepers. Salaries and allowances together about 103l.
 - XXXVI. Not applicable.
 - XXXVII. Altogether about 4l.
 - XXXVIII. About 200 gallons of rape oil, about 12 yards of the large cotton, and about 2 gross small cottons.
 - XXXIX. Rape oil 5s. per gallon.
 - XL. Cotton circular wicks, about 5l. 12s. annually.
 - XLI. None.
 - XLII. From the income of harbour.
 - XLIII. None.
 - XIV. None.
 - XLV. None.
 - XLVI. None.
 - XLVII. None.

RAMSGATE and RIBBLE.

- XLVIII. None.
- XLIX. None.
- L. By the Trustees of the Harbour, of whom several are Elder Brethren of Trinity House.
- LI. When visited by the Trust, 3 or 4 times in a year.
- LII. No.
- LIII. Duplicates. Oil stored in separate building near to lighthouse.
- LIV. None.
- LV. A red ball shown on the west cliff when 10 feet water; a red light at night when 10 feet; a green light when below 10 feet.
- LVI. None.
- LVII. Two keepers, the night divided.
- LVIII. To keep a good light, and to attend to the changing of the colour of the lights during the rise and fall of the tide.

This stands No. 114 on the list of lighthouses visited or seen afloat. It was inspected on the 5th of August 1859. The granite building is a fine structure at the entrance to the harbour on the end of the pier. The Dioptric fourth order apparatus has a fountain lamp with two wicks, and the colour is produced by screens of glass which surround the lens outside. The lamp was out of place, and the burners were not level. The first defect injures the action of the lens on the light; the second injures the production of light by the lamp, and must in some degree diminish the efficiency of the light. There was not the same neatness and cleanliness about the lantern as in the establishments of the general lighthouse authorities. The wicks were not neatly trimmed, and bits of stick and other small matters were observed. The light is amply sufficient for a harbour light, and was kept with sufficient cleanliness for practical purposes; but in this, as in nearly all the lights examined, the establishment under the local authority was inferior to the nearest establishment of a general authority.

For additional observations, see Vol. I.

BUOYS AND BEACONS.

- I. The Trustees of the Royal Harbour of Ramsgate, 22, Austin Friars, London.
- II. The only buoys belonging to the harbour are those within the piers. They are attached to chain moorings for the accommodation of shipping resorting to the harbour.
- III. There are no beacons connected with the harbour.

58. RIBBLE.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Ribble Lighthouse, Double Stanner, at the mouth of the River Ribble, in township and parish of Lytham, in the county of Lancaster, facing the Irish Sea.
- II. The Directors of the Ribble Navigation Company.
- III. Robert Parker, Managing Director, Preston.
- IV. Two lights one above the other. First, or lower light, shows red light, fixed, with south-west aspect right upon the sea. The top light, No. 2, shows a white light all round seaward and landward; is a fixed light also, and is 36 feet above the red light.
- V. In 1846 or 1847.
- VI. By the Ribble Navigation Company.
- VII. It is where the two channels meet the north and south.
- VIII. 1st February 1848.
- IX. Built by contract, by William Bond. The engineer was Robert Stevenson, Edinburgh.
- X. Sea lights.
- XI. Built of Longridge freestone, in round courses, in the rusticated style, with rubble stone walling for lining inside, and lime and sand plastered. The two lanterns are made of zinc roofs, with galvanized iron supports, with taper white glass windows; painted white; iron balustrade and wood handrail all round top.
- XII. One lightning conductor, copper, $1\frac{1}{2}$ inch diameter with large globe ball on top of lighthouse, with spikes fixed in and supported to the building by copper supports, and goes into the gravel bed below the basement.

RIBBLE.

- XIII. The height from the base is 72 feet.
 XIV. The height above the regular spring tide is 75 feet.
 XV. Fifteen miles distant.
 XVI. The top light is seen 15 miles, and the bottom light, viz., the red one, nine miles.
 XVII. The top light shows all round; the red light, or lower one, shows due west, and shows half round nine miles distant.
 XVIII. Stationary red and white lights.
 XIX. This does not apply.
 XX. The lights are put on at sunset, and put out at the coming of daylight in the morning.
 XXI. Dioptric lights.
 XXII. The third order, with two concentric wicks, one glass chimney to each of the two lights, with a brass reflector to lower light, which is red.
 XXIII. This does not apply.
 XXIV. Fresnal French, maker of the lenses, and Miller, of Leith, Edinburgh, of the lamps and cylinders.
 XXV. Dr. Faraday's tubes.
 XXVI. This does not apply.
 XXVII. This does not apply.
 XXVIII. This does not apply.
 XXIX. 1,470*l.* 19*s.* 7*d.*
 XXX. This does not apply.
 XXXI. The lower light, surface of lantern, 13 feet wide, by 3 feet 2 inches high. The top light, No. 2 (the white light), diameter of lantern is 8 feet 9 inches, and 3 feet 2 inches high. The two glass lenses are both 2 feet 10 inches high, and 1 foot 10 inches each diameter.

- XXXII. This does not apply.
 XXXIII. Cost of repairs of buildings for five years ending first quarter of 1858, 10*l.* Not contracted for.
 XXXIV. 1*l.* per year. Coated every two years. Not by contract.
 XXXV. A salary of 78*l.* per year for the keeper, he finding an assistant out of the above sum.
 XXXVI. 10*l.* for 1857 and 1858, 5*l.* each year.
 XXXVII. Two hundred and thirty-four gallons per year, and wicks at the rate of 6*s.* 6*d.* per year.
 XXXIX. Patent burning colza oil, supplied by Briggs and Company, City Oil Mills, London, at from 3*s.* 6*d.* to 4*s.* 6*d.* per gallon.
 XL. Cotton twilled, 3*d.* per dozen, 6*s.* 6*d.* per year.
 XLI. This does not apply.
 XLII. The tonnage of vessels, paid into the Ribble Navigation Company's Office.
 XLIII. For the Midsummer quarter, 1852, 12*l.* 6*s.* 2*d.*; 1858, 10*l.* 8*s.* 5*d.* Total income for 1852, 84*l.* 4*s.* 2*d.*
 XLIV. For 1852, 104*l.* 14*s.* 6*d.*; for 1858, 124*l.* 14*s.* 2*d.*
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. The Directors of the Ribble Navigation Company.
 LI. No fixed date.
 LII. No.
 LIII. One spare lamp to each light, trimmed ready. Two large oil cisterns in the bottom or basement room.
 LIV. None.
 LV. This does not apply to us. They never were adopted. Not necessary.
 LVI. This does not apply to us. They never were adopted. Not necessary.
 LVII. Never relieved.
 LVIII. The regulations are,—the keeper or his assistant to attend to the lights from the time of lighting to their being extinguished; in the day to clean up and trim the lamps, &c., and make all ready for night. The keeper is not allowed to be away from duty without leave.

BUOYS AND BEACONS.

- I. The Ribble Navigation Company.
 II. There is no chart. Lieutenant Williams made a survey of the estuary of the Ribble in 1854. This company applied for a copy of his survey, but did not obtain any. The total cost of maintaining buoys and beacons in 1852, 195*l.* 12*s.* 6*d.*, and in 1858, 143*l.* 16*s.* 2*d.* Number of buoys and beacons 24.
 III. No.
 IV. No.
 V. Buoys classified, see sketch or chart.
 a. Iron nose, wood and hooped
 b. From 10*l.* to 12*l.*
 c. Five shillings.
 d. Five shillings.
 e. Seventeen.
 f. Two of each class.

RIBBLE and ROCHESTER.

- g. Lytham Dock, at the buoyhouse.
 h. Four.
 i. Six.
 j. Wind, strong tides in the narrow of the channel, and vessels running over them.
 k. Stone from 6 cwt. to 2 tons, chain from $\frac{3}{8}$ to 1 $\frac{1}{2}$ inch.
 l. Cannot tell.
 m. By tender and sometimes by the day.
 n. Gut Channel Cage, North Channel Letter "No. 1."
 o. Nelson of Preston and two other buoys.
 VI. See the small sketch, No. 2.
 VII. No period is fixed while they keep tight.
 VIII. None.
 X. Seven up the river from Lytham to Preston.
 a. Church Scar, Knobs, Bonk Nook, &c
 b. 1820 to 1840.
 c. Landmarks up the river.
 d. Tar barrel on the top; a lantern if required.
 e. Wood chain shrouds.
 f. Black gas tar.
 g. By lamp if required, at ships' expense.
 h. Eight feet.
 i. No account.
 k. No separate income.

- XI. No alteration.
 XII. No need of any, they are done when necessary.
 XIII. No need of any, they are done when necessary.
 XIV. Ribble Navigation Company.
 XV. Ribble Navigation Company.
 XVI. No income. Total expenditure for buoys and beacons in 1852, 195*l.* 12*s.* 6*d.*, and 1858, 143*l.* 16*s.* 2*d.*
 XVII. None.
 XVIII. None.
 XIX. Jonah Ashburne, Harbour Master, Lytham; in June.
 XX. Jonah Ashburne, Harbour Master, Lytham; in June.
 XXI. Shipping Gazette.
 XXII. Harbour Master.
 XXIII. Write to Ribble Navigation Office, Preston, or Harbour Master, Lytham.
 XXIV. No complaints or representations.
 XXV. No.
 XXVI. None.

LLOYD'S EVIDENCE.

- I. William Banister, Lloyd's agent, Lytham.
 II. PRESTON.
 III. Ribble Navigation Company, Robert Parker, managing director.
 IV. Yes.
 V. The buoy No. 1, in both channels would be better if they were larger.
 VI. A lightship would be of great service, but at present there is not sufficient trade in the place to support one.
 VII. The lighthouse below Lytham is lighted with oil. The harbour light at Lytham is lighted with gas.
 VIII. I am not aware there has been any accident in consequence of the lights not being properly attended to.
 IX. Some of the buoys were taken away by the ice in December, but were immediately replaced.
 X. Not any that I am aware of.
 XI. Not wanted.
 XII. Not necessary, the bar being so far distant from the shore.
 XIII. The buoys are nun-shape, with cages on the top in Gut Channel; in the North Channel, of the same shape, but without cages. They are placed in the deepest water, painted black, numbered with white letters.
 XIV. None.
 XV. There are 3*d.* per ton charged for the lights yearly, and 4*d.* per ton for the buoys, beacons, and each voyage on the ship, collected by the Ribble Navigation Company.
 XVI. I have not heard any complaints being made lately.
 XVII. The general opinion is that the sea light is considerably too low, in consequence of the fog, which generally lay about the top of the light, when the wind is from the southerly direction.
 XVIII. No complaints now that I am aware of.
 XIX. Yes.
 XX. I am not aware of.

RIBBLE.

Circular V.

Circular VI.

ROCHESTER.

RYE.

60. RYE.

RYE.

Circular III.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Rye, Sussex.
 II. None.
 III. Harbour Master.
 IV. Two, 530 feet apart, and 1 red light, lit at half flood, extinguished half ebb.
 V. Not known.
 VI. Not known.
 VII. Not known.
 VIII. Not known.
 IX. Not known.
 X. Harbour.
 XI. Wood; white paint.
 XII. None.
 XIII. One 24 feet. One 43 feet.
 XIV. One 18 feet. One 37 feet.
 XV. Not known.
 XVI. About six.
 XVII. Not known.
 XVIII. Fixed, white.
 XIX. None.
 XX. Fixed.
 XXI. Copper silvered.
 XXII. One burner.
 XXIII. None.
 XXIV. None.
 XXV. Copper funnel.
 XXVI. None.
 XXVII. None.
 XXVIII. None.
 XXIX. Not known.
 XXX. None.
 XXXI. Not known. Dimension 3 feet wide, 3 feet 6 inches high.
 XXXII. None.
 XXXIII. Fifteen shillings each.
 XXXIV. Coated yearly, about two pounds the two.
 XXXV. One, 17s. 6d. per week.
 XXXVI. None.
 XXXVII. None.
 XXXVIII. Twenty-eight gallons colza, 4s. 9d., 14 gallons sperm, 8s. 6d.
 XXXIX. See above.
 XL. Cotton 18 dozen, 6s.
 XLI. None.
 XLII. Harbour funds.
 XLIII. None.
 XLIV. Not known.
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. Committee of Survey.
 LI. Quarterly.
 LII. No.
 LIII. Two spare, kept in lighthouse.
 LIV. None.
 LV. Night, two white lights lit at 10 feet, and extinguished at 10 feet. See Code of Signals sent herewith for day.
 LVI. See previous answer.
 LVII. None required.
 LVIII. Verbal orders from time to time by Committee of Survey.

Circular V.

BUOYS AND BEACONS.

- I. Harbour Commissioners.
 II. None.
 III. No.
 IV. None.
 V. Sent herewith.
 a. Wood.
 b. Do not know.
 c. Five shillings.
 d. Two shillings.
 e. Four.
 f. Five.
 g. In the workshop.
 h. Five.
 i. Three.
 j. Wind and vessels fouling.
 k. Chain fast to wood frame buried in sand.
 l. None.
 m. Not by tender.
 n. Outer buoy No. 1 west; inner buoy No. 2.
 o. One white buoy east.

- VI. Wooden buoys.
 VII. Quarterly.
 VIII. By the Harbour master.
 IX. Sent herewith.
 X.
 a. One east, 1 west.
 b. Not known.
 c. Guide to the harbour.
 d. See plan.
 e. Wood.
 f. One black, one white.
 g. Oil.
 h. See plan.
 i. Not known.
 j. Twenty shillings each.
 k. Included in harbour dues.
 XI. None.
 XII. Adapted according to circumstances.
 XIII. None.
 XIV. Harbour dues.
 XV. The same.
 XVI. None.
 XVII. None.
 XVIII. None.
 XIX. Harbour master.
 XX. The same.
 XXI. Replaced at low water.
 XXII. Yes.
 XXIII. Harbour master informed forthwith.
 XXIV. None.
 a. See previous answer.
 b. See previous answer.
 c. See previous answer.
 d. See plan.
 e. Black and white.
 f. None.
 g. None.
 h. None.
 i. None.
 k, l. Placed according to shifting of sand.
 m. None.
 n. None.
 XXV. None.
 XXVI. None.
 XXVII. None.

LLOYD'S EVIDENCE.

- I. Stephen Britt, Rye, Harbour Master.
 II. RYE.
 III. Commissioners of Rye Harbour.
 IV. Yes.
 V. None.
 VI. None.
 VII. Colza oil for the two white lights, sperm oil for the red light.
 VIII. None.
 IX. Occasionally, with strong gales and heavy sea have broke from their moorings, but replaced at low water same tide; no accident ever occurred in consequence.
 X. None.
 XI. Two white lights, high and low, when in one indicates that you are in a fair way for the harbour; those lights are lit when there is 10 feet at the gauge board, and extinguished when the water has fallen to 10 feet at gauge board. One red light at the end of the east pier lit at half flood, and extinguished at two hours ebb tide. See printed notice.
 XII. None required.
 XIII. Two black can buoys on the west side of the entrance of the harbour, one white nun buoy on the east side.
 XIV. None required.
 XV. None.
 XVI. No complaint made.
 XVII. They consider them sufficient.
 XVIII. No dues for lights (harbour).

NOTICE.

The telegraph at the mouth of Rye Harbour, near the flagstaff, shews the flowing of the tide, the frame and shutters of which are black, and when not in use will hang vertical, that is, appear all black; and when in use, the shutters will be canted horizontally, so as to show a circle of light through the frame, and will be worked as follows:—
 When there is 8 feet water, one shutter will be canted.
 When there is 9 feet water, both shutters will be canted.

RYE and SALTASH.

- When there is 10 feet water, the flag will be hoisted.
 When there is 11 feet water, one shutter will be canted.
 When there is 12 feet water, both shutters will be canted.
 So that the shutters without the flag denote under 10 feet; and with the flag above 10 feet.
 When there is more than 12 feet water, red flags will be hoisted on the telegraph flagpole as follows:—
 When there is 13 feet water, one flag will be hoisted half-mast up.
 When there is 14 feet water, one flag will be hoisted quite up.
 When there is 15 feet water, two flags will be hoisted half-mast up.
 When there is 16 feet water, two flags will be hoisted quite up.
 A black ball will be hoisted on the ball-pole, at the harbour flagstaff, in bad weather or low tides, to signify that the pilots cannot get off, and that the harbour cannot be approached with safety by strangers or those not well acquainted with it.
 A blue burgee will be hoisted on the ball-pole, to signify high water at the pier head.
 By Order of the Commissioners.

STEPHEN BRITT,
 Harbour Master.

10th February 1860.

61. SALTASH.

LLOYD'S EVIDENCE.

- I. George Gilpen, 2, Alfred Cottage, Citadel Road, Plymouth, master mariner.
 II. PLYMOUTH.
 III. Trinity for the lights, Queen's Harbour-master for buoys.
 IV. Yes.
 V. None.
 VI. Breakwater and Eddystone, oil; pierhead light, gas.
 VIII. I am not aware.
 IX. I have not known.
 X. Do not know of any.
 XI. None wanted.
 XII. Fog bells.
 XIII. Chequered, black, white and red, barrel and conical.
 XIV. No.
 XV. Referring to my last light bill, dated 8th inst., I find no local lights charged but general coast, $1\frac{1}{2}d.$ per ton, less 50 per cent., paid to collector of customs, Plymouth.
 XVI. Do not know of any.
 XVII. Never heard any complaint.
 XVIII. The port charges are generally considered moderate, but I have heard complaints, viz., that whereas the charge on a Spanish ship for the Cobler buoy (known as Saltash dues) is six shillings, that the Government have refunded five shillings, in order to place foreigners on same terms as British ships.
 XIX. Certainly not; the dues on Cobler buoy are collected by the corporation of Saltash, a little village some four miles up the Hamoaze, under ancient privileged charters, granted, I believe, in the reign of Elizabeth; the dues amount to an annual rental of £, and the only expenditure, out of such dues, is confined to the keeping in repair of the Cobler buoy only.
 XX. No.

I. W. D. Collier, Plymouth, merchant, and agent for Lloyd's.

II. PLYMOUTH.

- III. T. E. Ditcham, agent to the Trinity Corporation, 6, Sutton Place, Sutton Road, has the charge of the lights; William Thompson, harbour-master, Bonisand, has the charge of the buoys.
 IV. Well buoyed, but an addition or improvement required in the lights.
 V. The breakwater light is a red light, not easily distinguished in dark weather at sea. An improvement is suggested in this light, and an additional distinct "flash" light, or other light sufficiently distinct in its character, placed on the New Stone.
 VI. A very bright, or flash-light placed on the New Stone, because the harbour is difficult to make, especially from the westward, and the red breakwater light is not easily seen in dark weather. (Mem. There seems to be a general objection to red lights, as not easily seen.)
 VII. Oil is used at the Eddystone and breakwater lights; gas on the pier light.

SALTASH—SANDWICH—SAUNDERSFOOT.

- VIII. Not aware.
 IX. The Cobler buoy is replaced, I know of no accident in consequence; it was last adrift about two months since.
 X. I am not aware of any in particular, but refer to the chart of wrecks on the eastern coast, near the port, where some serious losses have taken place.
 XI. No tide signals used or required.
 XII. A bell fog signal is used at the breakwater.
 XIII. The buoys are barrel and conical shaped, and are coloured white, black, red, and chequered; when placed on particular shoals they are known also by name. On the eastern channel the passage is indicated by red and chequered buoys; the sailing directions refer to these buoys; there seems to be no change required.
 XV. The corporation of Saltash, an ancient borough on the Tamar, levy one shilling on every British vessel every time she enters the port of Plymouth, two shillings for every foreign vessel, not Spanish, and six shillings for every Spaniard; one shilling on each vessel only is collected, the difference between foreign and British is repaid the corporation by Government; for this they maintain the Cobler buoy in repair only.
 XVI. None to my knowledge.
 XVII. The general feeling seems to be favourable to the efficiency of the lights; but a light on the Mew Stone is much desired, and the red breakwater light seems to be considered inefficient by many.
 XVIII. The Saltash dues, levied under an old charter in respect nominally of the Cobler buoy, are much complained of, and amount to a considerable sum. There are no local light dues, but the duties here are onerous, and complained of by the shipping interest in general.
 XIX. The Saltash dues, after payment of a small charge for the Cobler buoy, are, it is said, divided amongst the members of the corporation of Saltash, and are applied to no public use whatever.
 XX. I am aware of no opinion on the subject; there seems to be, generally speaking, a feeling of satisfaction with the present arrangement. Most of the buoys are under the care and management of the authorities of the Royal Navy.

62. SANDWICH.*

SANDWICH.

63. SAUNDERSFOOT.

SAUNDERS-FOOT.

LLOYD'S EVIDENCE.

- I. William James, Saundersfoot Tenby, Pembroke-shire Shipping Agent, and Agent to Lloyd's.
 II. SAUNDERSFOOT HARBOUR.
 III. Saundersfoot Harbour and Railway Company, Saundersfoot, William Foley, Esq., Harbour Master.
 IV. Harbour of Saundersfoot not well lighted, but improvements are about being made; the coast in the vicinity sufficiently lighted, and the harbour of Saundersfoot and the coast sufficiently buoyed.
 V. The lighthouse at Saundersfoot pier should be raised in height, and a brighter and larger light introduced.
 VI. No additional light required if the suggestion in answer to No. V. is carried out, so that the light could be seen at a greater distance, and be made more visible.
 VII. Candles in the Saundersfoot lighthouse, oil in the Trinity lighthouses.
 VIII. Not aware of any.
 IX. None of the buoys have been displaced.
 X. No proof can be given of any accident.
 XI. A light exhibited at night, and a ball by day, when eight feet of water at the pier, and kept up until the tide falls to eight feet.
 XII. No fog signals used.
 XIII. Buoys only used for warping vessels.
 XIV. No change.
 XV. $3d.$ per vessel under 30 tons register; $6d.$, under 50; $2d.$, from 50 to 70 tons; $1s.$, 100 to 150; $1s.$, $6d.$, 200 tons; $2s.$ and so on, paid to the harbour master.
 XVI. I am not aware of any complaints.
 XVII. A better light required.
 XVIII. No complaint.
 XIX. The dues collected for lights are carried to the general account of the Harbour Commissioners.
 XX. Not aware of any.

Circular VI.

Circular VI.

64. SCARBOROUGH.

LLOYD'S EVIDENCE.

- SCARBOROUGH.
SEAHAM.
Circular VI.
- I. William Wear, shipowner, and agent to Lloyd's, Scarborough.
- II. SCARBOROUGH, and from the south cheek of ROBIN HOOD'S BAY to SPEETON CLIFF.
- III. The commissioners of the piers appointed under an Act of Parliament. Abraham Appleyard, the present harbour master.
- IV. Sufficiently lighted, except at Filey Bridge.
- VI. I would recommend a green light on the point of Filey Bridge called Carnase, also a bell buoy at the end of the bridge, would be very useful in foggy weather.
- VII. Gas for the tidal light in the lighthouse.
- VIII. No.
- IX. No.
- X. I have known many accidents in Filey Bay and in the Bridge, for want of a bell buoy or a light.
- XI. By day a ball is hoisted on the top of the lighthouse, at tide time; but I think a red flag would be preferable. By night a red light is shown at tide time.
- XII. No fog signals are used, but think they might be useful for ships and fishing boats.
- XIII. There are no buoys except warping buoys, at Scarborough. There is a black buoy at Filey Bridge End.
- XIV. No.
- XV. Sixpence per ton on coals landed or re-shipped here is paid to the commissioners of the pier, and three halfpence per ton to the corporation. There is also paid one halfpenny per register ton by all vessels coming into the port, and 1s. 6d. to the corporation for each vessel.
- XVI. None.
- XVII. The general feeling is in favour of a light and bell buoy in Filey Bay as above stated.
- I. A. Appleyard, harbour master.
- II. SCARBOROUGH.
- III. Appleyard, harbour master, under control of Harbour Commissioners.
- IV. A coloured light on Filey Brig, say green.
- V. Sufficiently lighted and buoyed.
- VI. Carnase Land for a lighthouse before recommended as a guide for Filey Bridge.
- VII. Scarborough tide lighted with gas.
- VIII. None.
- IX. No.
- X. Known several vessels get on Filey Brig. Perhaps a light might have prevented.
- XI. By day a ball from top of lighthouse; by night a powerful gas light.
- XII. None.
- XIII. None but Filey Brig, which is black.
- XIV. No.
- XV. None by harbour authority.
- XVI. None.
- XVII. General feeling is that a light, stationary, and coloured green, would be of service on Filey Brig.

65. SEAHAM.

LIGHTHOUSE.—(SPECIAL RETURN.)

- SEAHAM.
Circular III.
- I. Seaham Harbour.
- III. J. H. Ravenshaw, Seaham Harbour.
- IV. Two lights; one, the upper, a fixed white light; and the lower in the same building is a revolving red light, to distinguish it from Sunderland light.
- V. No application.
- VII. To show the harbour of Seaham.
- VIII. 1831.
- IX. William Chapman, C.E. to the late Lord Londonderry.
- X. Third class. Catadioptric, with lenticular lenses.
- XI. Stone; not coated nor coloured.
- XII. No.
- XIII. Fifty-three feet four inches.
- XIV. Ninety-four feet six inches.
- XV. About 7 or 8 miles.
- XVI. About 14 miles.
- XVIII. One fixed, white; one revolving, red; half minute.
- XX. Between sunset and sunrise.
- XXI. Cata-dioptric.

SEAHAM AND SHOREHAM.

- XXII. Third. One Argand burner.
- XXIII. Altered in 1856.
- XXIV. Messrs. Chance, Birmingham.
- XXVI. A bell on the pier.
- XXXVII. Gas.
- XLV. No complaints.
- XLVI. None.
- XLVII. None.
- XLVIII. No complaint.
- XLIX. No complaint.

66. SHOREHAM.

LIGHTHOUSE.—(SPECIAL RETURN.)

- SHOREHAM.
Circular
- I. Shoreham.
- II. Commissioners of the harbour.
- III. Harbour Master.
- IV. Two lights N.N.E. from each other 1,100 feet.
- V. I do not know when first application was made, but permission was obtained from the Trinity corporation in October 1846 to improve the high light.
- VI. By the commissioners of the harbour.
- VII. To place the two lights on entrance of the harbour in a direct line bearing by compass N.N.E. and S.S.W.
- VIII. High light as improved November 1846.
- IX. Samuel Sanders, Engineer, and Messrs. Cheesman and Son, of Brighton, Builders. Built by contract.
- X. Harbour lights.
- XI. High lighthouse built of Portland stone. Low lighthouse built of wood and painted white.
- XII. No.
- XIII. Fifty feet.
- XIV. High light 48 feet, tide light 25 feet.
- XV. High light about 12 miles.
- XVI. I cannot answer this.
- XVII. 180° E.S.E. and W.N.W.
- XVIII. Fixed and bright, except at slack water, when the tide light is made red.
- XX. High light from sunset to sunrise. Low light when a vessel drawing 11 feet of water can enter the harbour.
- XXI. High light, dioptric. Low light, Argand lamp with a parabolic reflector.
- XXII. High light, fourth order.
- XXIII. 1846.
- XXIV. William Crane Wilkins, 24, Long Acre, London.
- XXV. Professor Faraday's.
- XXVI. None.
- XXIX. High lighthouse, 885*l*.
- XXXI. 8 feet 4 inches outside, and cost, including the dioptric light, apparatus, and everything complete, 426*l*. 1*s*. 6*d*.
- XXXIII. Nothing.
- XXXIV. Painting of lantern about 10*s*. per annum.
- XXXV. One man at 1*s*. per week.
- XXXIV. This is included in the cost of lantern.
- XXXVII. No expense with illuminating apparatus, but 10*l*. about expense for two new lamps upon an improved principle.
- XXXVIII. High light consumes one quart of oil in 10 hours.
- XXXIX. Rape seed, 1857, 5*s*. 10*d*. per gallon; 1858, 5*s*. 6*d*. per gallon.
- XLI. Revenue of harbour.
- XLIII. No charge is made for high light. Tide light 4*d*. per foot on vessels under 12 feet, and 6*d*. above. This is according to Harbour Act.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- LII. None.
- LIII. None.
- LIV. None.
- LV. At slack water the tide light is made red. By day there are signals made showing the depth of water, a copy of which I enclose.
- LVI. Marryat's signals.
- LVII. Man remains all night.
- This was visited on the 24th of August by Dr. Gladstone. The lighthouse is a well-built stone edifice, with a dioptric fourth order apparatus, with a large fountain lamp; it illuminates half the circle,

SHAM. SHOREHAM and SOUTHAMPTON.

and as there is no reflector, half the light is of no service. The harbour commissioners have put it in charge of Mr. Burt, who was a shipwright and is infirm; he sits in a wooden hut near by, and watches the light at night. He has no assistant, and is paid 18s. a week. He lights and extinguishes the lamp when he thinks the proper time has arrived. No books are kept.

The tidal light on the pier is only lighted when there is sufficient water for ships to enter, for which purpose they bring the two lights into one; it is white as the tide flows, red when it ebbs. There are tide signals by day by means of flags, pennants, and balls. The keeper lives at Southwick. The lights were not burning at the time of the visit.

For additional observations, see Vol. I.

67. SOUTHAMPTON.

BUOYS AND BEACONS.

- I. The Commissioners for improving the Port and Harbour of Southampton, acting in execution of the Acts 43 Geo. III. cap. 21, 50 Geo. III. cap. 168, and 9 Viet. cap. 26.
- II. Chart No. 1 denotes the extent of Commissioners' jurisdiction, and in a marginal statement the buoys and beacons, with particulars as to cost of maintaining the same, and income derived therefrom.—N.B. The above chart is enlarged to double size from the Admiralty chart No. 5, herewith sent, and extends to Calshot Spit, about seven miles from the Royal Pier, Southampton.
- III. No.
- IV. The Commissioners claim compensation from persons who may cause damages to any of the buoys and beacons.
- V. Tracing No. 2 shows those in use, viz., two sizes, and of conical shape. Tracing No. 3, Captain Peacock's refuge bell buoy beacon, see No. 7 on chart No. 1.
- Best quality oak staves, $1\frac{1}{2}$ inch thickness, and iron hooped.
 - Largest size buoy 8l., small size buoy 5l., exclusive of mooring chain and stone. Cost of Capt. Peacock's refuge beacon 63l.
 - Scraping and cleaning, tarring and lettering, about 10s. large size buoy, and 6s. small size buoy.
 - Sixteen, see marginal reference, Chart No. 1.
 - Two large size buoys, three smaller size buoys, and one spare bell buoy beacon, Captain Peacock's.
 - In custody of contractor for time being for the repairing, scraping, cleaning, and mooring buoys and beacons, and usually kept at his wharf, Itchen River.
 - Six, exclusive of moorings. None.
 - Iron chain $\frac{1}{2}$ to $1\frac{1}{2}$ inch. Iron swivels, shackles, &c., attached to mooring stone of different sizes or weight.
 - The buoys are placed in three fathom water. Cost of mooring about 3l., including labour and hire of lighter; for Captain Peacock's buoy the moorings would be not less than 10l.
 - New buoys procured when necessary on report of surveyor. The buoys in use last from 20 to 30 years.
 - Buoys on the west side of river painted black, buoys on the east side painted red. Name of each buoy is distinctly marked; see tracing No. 2.
 - Sixteen.
- VI. Those in use answer the purpose of navigating the Southampton Water.
- VII., VIII. They are monthly examined by contractor for time being, and repairs, cleaning, scraping, or any defects immediately attended to, under surveyor's superintendence.
- IX. Five; see tracing No. 4.
- X.
- See chart No. 1 in marginal statement. The beacons are denoted by letters A to E.
 - A, re-erected 1858. B to D re-erected 1859. E, 1845.
 - To denote edge of channel.
 - See sketches.

SOUTHAMPTON.

SOUTHAMP-

TON.

Circular V.

- Beach piles and Memel bracings, iron bands, &c.
 - Piles black; spar and cradles red.
 - No. The beacon marked B in chart No. 1 is occasionally lighted in foggy weather, at the expense of the South-western Steam Navigation Company, for the French and Channel Island steamers, by a temporary signal lamp.
 - 15 to 25 feet.
 - Itchen river 25l. each. Cadland, 22l. 12s. 6d.
 - About 25s. average.
 - Included in reply to question No. XVI.
- XI. See reply to No. VI. In addition to preceding remarks the River Itchen above docks, the Hamble river, and the portions of Southampton Water extending to and called Eling river, are boomed by fir tree poles, with the tops left on to denote edge of channel.
- XII., XIII. No complaint or application for additional buoys and beacons have been made.
- XIV., XV. General fund of the commissioners acting in execution of the several Acts named in question No. 1.
- XVI. Total income for the summer quarter 1852, 59l. 14s. 2d.; 1853, 74l. 14s. Total income for 1852, 295l. 17s. 2d.; total expenditure for 1852, 117l. 18s. 5d.; 1853, 169l. 6s. 10d.
- XVII. Nil.
- XVIII. Nil.
- XIX. Surveyor monthly, also in special cases reported to him.
- XX. See reply to No. XIX.
- XXI. No instance has occurred rendering it necessary to inform the public. Steamboats passing, coast guard or customs, give information to contractor or surveyor if necessary.
- XXII. Contractor for time being attends to it immediately, and surveyor inspects same.
- XXIII. See reply to No. XXI.
- XXV. Captain Peacock's refuge bell buoy beacon has been introduced, two of which the commissioners have, one being kept in reserve in case of accident, repairs, or damages to the other, and to replace it immediately.
- XXVI. None.
- The Commissioners examined Observations manders of the steamers of the Royal Mail Company, by Commissioners, on the 6th of July, at Southampton. They were in favour of firing a gun at the Needles in fogs; of placing a light at the entrance of Southampton water, on a bank called the Thorn; and one on St. Alban's Head; they all wish for larger buoys in the Solent. The opinions of many of these gentlemen will be found in the evidence printed from returns filled up by themselves.

LLOYD'S EVIDENCE.

Circular VI.

- I. W. I. Le Fenoyes, merchant, and Lloyd's agent, Southampton.
- II. PORT of SOUTHAMPTON.
- III. Commissioners of Port and Harbour, now the Local Board of Health, or Municipal Council of the Town.
- IV. I consider that they can be improved.
- V. The buoys should be much larger for the benefit of the navigator in general; they now answer the purpose of the pilots.
- VII. Gas in harbour lights; oil in Calshot Floating Light.
- IX. Bell buoy on Spit, often displaced or capsized, not being large enough. The bell is missing at the present time.
- XI. Not required.
- XII. Gong on board; Calshot light vessel well attended to.
- XIII. Buoys are painted black on port side, and red on starboard.
- XIV. Buoys of larger dimensions. Form, (see sketch).
- XV. Local light dues, 4-16ths of 1d. per ton, coasters; local light dues, 8-16ths of 1d. per ton, foreign; boomage dues on vessels under 50 tons, 1s. 6d.; boomage dues on vessels above 50 and under 100 tons, 2s. 6d.; boomage dues on vessels above 100 tons, 5s.; boomage dues on foreign ships double.
- XVIII. No cause of complaint.
- XIX. They are so.
- XX. No complaint of the management.

SOUTHWOLD.

68. SOUTHWOLD.

Circular III.

Southwold, May 13, 1859.
 Re Royal Lighthouse Commission.
 SIR, I HAVE endeavoured to answer the questions which I conceive to be somewhat applicable to this place. With regard to a lighthouse, we have not one at Southwold, but we have gas lamps burning as a protection to the fishing boats, which I have noticed.

I am, &c.
 J. F. CAMPBELL, Esq., JON. ROBERT GOODING,
 &c. &c. Clerk to the Harbour Commissioners.

SOUTHWOLD LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Southwold, Suffolk.
- II. The Southwold Gaslight Company.
- III. The Corporation of Southwold.
- IV. Six gas lamps in front of the sea, extending to a distance of 668 yards, and the average distance apart is about 133 yards. Vide No. LII.
- V. In the month of February 1848.
- VI. The Mayor, Aldermen, and Burgesses of the borough of Southwold.
- VII. In consequence of being opposite the sea, and consequently affording guidance to fishing boats, &c., landing in the night.
- VIII. In the month of September 1848.
- IX. Mr. George Edmund Child, of Southwold, Gas Engineer, &c.; and not built by contract.
- X. Gas lamps.
- XI. None.
- XII. None.
- XIII. None.
- XIV. Average height of light about 40 feet.
- LII. Only three gas lamps are lighted from 1st May to 1st September, extending about 323 yards.

Circular V.

BUOYS AND BEACONS.

- I. The Commissioners of Southwold Harbour.
- II. The jurisdiction extends 250 yards seaward of the entrance of the harbour. There are three buoys and two beacons. A chart is attached hereto.
- III. It has exclusive jurisdiction.
- IV. Vide above answer.
- V. See sketch.

- a. Wood, with iron strap and shackle at lower end.
- b. From 3*l.* to 4*l.*
- c. About 10*s.* each year.
- d. None, as it is usually tarred or blacked when changed.
- e. Three.
- f. Three.
- g. At the harbour works.
- h. Three.
- i. S.E. buoy displaced in 1858, by reason of the chain being worn through.
- j. By chain wearing through with constant friction.
- k. By one fluke anchor, 14 cwt., and five fathoms of chain.
- l. About 13*l.* There is seldom more than two fathoms where the anchors lie.
- m. Wood, purchased and made by their own workmen.
- n. The bearings by day and none by night.
- o. Three.

- VI. The log buoys are most adapted for our work, as warps are frequently attached to them.
- VII. Generally examined every year, but sometimes allowed to remain two years.
- VIII. The harbour master and surveyor of works uses his own discretion.
- IX. See sketch.
- X. Two white beacons with black tops, one 8 feet and the other 20 feet.
 - a. None in particular; both in one harbour; open.
 - b. The present ones placed in lieu of old ones in 1853.
 - c. A guide for entering the harbour.
 - d. By their height and position.
 - e. Wood.
 - f. White, with black tops.
 - g. By lanterns, when vessels take the harbour.
 - h. About 24 feet.
 - i. From 2*l.* to 3*l.*
 - j. From 8*s.* to 10*s.* per annum.
 - k. None whatever.

SOUTHWOLD—SPALDING—ST. IVES.

SOUTH

Circular

- XI. None.
- XII. None, as the sands are constantly shifting, according to the direction of the wind. Obligated to lay temporary buoys with boats upon vessels entering, if the entrance is bad.

- XIII. None.
- XIV. At the sole expense of the Harbour Commissioners.
- XV. At the sole expense of the Harbour Commissioners.
- XVI. The present harbour master has no means of ascertaining this information, as he has held office about one year, and no memoranda were left by his predecessor.

- XVII. None.
- XVIII. None.
- XIX. By harbour master and surveyor for the time being.
- XX. Vide previous answer.
- XXI. If such should occur, replaced immediately.
- XXII. The harbour master or his assistants.
- XXIII. By superintendent of harbour, always on the spot.
- XXIV. None.
- XXV. None required since these were placed, which seem to answer the purpose very well.
- XXVI. All under the order and superintendence of the harbour master and surveyor.
- XXVII. The system adopted seems to answer every purpose.

69. SPALDING.

SPALDING

Circular III.

SIR, Spalding, 6th May, 1860.
 YOUR letter of the 1st instant, addressed to the Town Council of Spalding, was delivered to me yesterday. In reply, on behalf of the Welland Trustees, I have to say that the buoys and beacons connected with the River Welland (save only the small river channel pile beacons which are put down and removed as necessary by our river pilots) are under the exclusive jurisdiction of the Boston Harbour Trustees, the Welland Trustees paying to them one third of the cost of maintenance, &c.

The information you ask for must come from the Boston gentlemen.

I am, &c.,
 J. F. CAMPBELL, Esq., CHAS. F. BONNER,
 Buoy and Beacon Commission,
 7, Millbank Street, London.

70. ST. IVES.

ST. IVES

Circular

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. St. Ives Harbour Commissioners.
- II. Pier Light Harbour Commissioners.
- III. Pier Light Harbour Commissioners.
- IV. One light at the end of the pier; one light at Godrevey, four miles from pier.
- V. Harbour light from the period of the erection of pier in 1777.
- VI. In St. Ives.
- VII. Tidal light to show when vessels may come in to the pier.
- VIII. Harbour light; Godrevey light, March 1859.
- IX. Trinity Board contracted for Godrevey.
- X. Harbour light, gas; Godrevey light, oil.
- XI. Harbour building, granite.
- XII. No.
- XIII. Twenty feet.
- XIV. Seventeen feet.
- XV. Seven miles.
- XVI. Seven miles.
- XVII. Harbour, fixed, gas. Trinity Board informed us that they had given the particulars of the light at Godrevey to the Commissioners.
- XX. For vessels to come in the pier.
- XXI. Gas reflectors.
- XXII. One burner.
- XXIII. None.
- XXVI. None for harbour; at Godrevey a large bell.
- XXVIII. No register.
- XXIX. Harbour; unknown.
- XXX. Completed.
- XXXI. Unknown; dimensions, six feet.
- XXXII. No.
- XXXIII. 5*l.*

ST. IVES.

- XXXIV. 5*l.*; and yearly.
 XXXV. 8*l.*
 XXXVI. 2*l.*
 XXXVII. Included in the above.
 XXXVIII. None; gas.
 XXXIX. None.
 XL. Gas.
 XLI. None.
 XLII. From a small fund collected for ballast; paid to the Commissioners of the Pier Trust.
 XLIV. 20*l.* for gas; 18*l.* for salary; 7*l.* for repairs.
 XLV. None.
 XLVI. None.
 XLVII. None.
 XLVIII. None.
 XLIX. None.
 L. No inspection.
 LII. No.
 LIII. Gas.
 LIV. None.
 LV. None used.
 LVI. None.

The Trinity Board having been communicated with respecting Godrevy, they informed us, that all lights in which they are interested, replies to the questions would be sent to the Commissioners by them.

LLOYD'S EVIDENCE.

- VI. I. John N. Tremearne, agent to Lloyd's, &c., St. Ives Harbour Commissioner, &c.
 II. PORT of SAINT IVES, CORNWALL.
 III. Trinity Board for Godrevy Light and Stones Buoy; Messrs. Harvey & Co. for tidal lights at the entrance of Hayle river; Messrs. Harvey & Co., Messrs. Sandys, Vivian, & Co. for buoys at entrance of Hayle river; St. Ives Harbour Commissioners for St. Ives Harbour tidal light.
 IV. Well lighted since the erection of Godrevy; well buoyed when Herbert's floating beacon was placed off the Stones, which was carried away November 1st.
 V. Should Herbert's floating beacon be made to withstand the tremendous ground sea which so frequently fall on the Stones, the object would be accomplished to point out to mariners the position of those dangerous rocks.
 VI. A large floating beacon on the outside of the Stones.
 VII. Godrevy light, oil; harbour tidal light, gas; Hayle tidal light, oil.
 VIII. No.
 IX. Trinity Stones Buoy, placed March 1858; carried away, December 1858. Herbert's floating beacon, placed off the Stones January 1859; carried away, February 1859. Trinity Buoy, placed there March 1859, still remains. Herbert's beacon (new one), placed off the Stones September 1859; carried away, November 1859. No accident has occurred in consequence.
 X. Numerous wrecks previous to March 1858, when a light ship and buoys were placed off the Stones. Since that period no accident has occurred.
 XI. No. Harbour light is only shown when the water is sufficient for vessels to come into the pier.
 XII. One large fog bell at Godrevy Lighthouse; sound heard at a distance, mariners have informed me, of half a mile.
 XIII. Trinity buoy off the Stones, black; usual form (see sketch); Hayle buoys, black; floating beacon, Herbert's, red. Form; round, sides straight, with a tower rising 27 feet.
 XIV. Various opinions have been stated as to the forms of buoys to withstand the tremendous ground sea off the Stones.
 XV. None for St. Ives.
 XVI. Previous to March 1858, continued complaints and memorials had been presented for a light to be placed on the Stones or Godrevy to point out the position of the Stones, on which so many vessels had been wrecked and crews drowned.
 XVII. Mariners are unanimous in their opinions as to the efficiency of the light at Godrevy, and its great benefit to shipping, and also of such a conspicuous object as Herbert's floating beacon was, when off the Stones, in pointing out the extreme end of those rocks.
 XVIII. No dues payable.
 XIX. None.

II.

ST. IVES and STOCKTON-ON-TEES.

ST. IVES.

- XX. No.—The answers to the questions No. I. to XX. have been placed before the harbour commissioners, the harbour master, and others, who agree to their correctness. Messrs. Harveys & Co., Hayle, forwarded their answers to me this morning, which are enclosed.—January 6th, 1860.

Circular VI.

- I. Harvey & Co., Hayle, Cornwall, merchants and ship-owners.
 II. HARBOUR of HAYLE, PORT of ST. IVES, Cornwall.
 III. Trinity Board for Godrevy Light and Stones Buoy; Messrs. Harvey & Co. for tidal lights at the entrance of Hayle; and Messrs. Harvey & Co. and Sandys, Vivian & Co., for buoys at the entrance of Hayle river.
 IV. Well lighted since the erection of Godrevy Light. Well buoyed when Herbert's floating beacon was placed off the Stones, which was carried away in November last.
 V. If a beacon such as Herbert's could be made to withstand the ground sea, the object would be accomplished, to point out the position of the outside of those dangerous rocks, the Stones.
 VI. A beacon on the outside of the Stones would be most desirable.
 VII. Godrevy Light, oil; St. Ives Light, gas; Hayle Tidal Light, oil.
 VIII. No.
 IX. Trinity Buoy placed outside the Stones, carried away, 1858; floating beacon carried away, 1859; another placed off the Stones, and again carried away, 1859. A Trinity buoy now remains off the Stones. No accident has occurred, that we are aware of, in consequence.
 X. Many wrecks have taken place previous to the light being placed on Godrevy. No accident has occurred since.
 XI. Tide signals are used for the tidal harbour of Hayle, two lights are put up when 12 feet of water is in the river.
 XII. A bell at Godrevy heard at half a mile off.
 XIII. Trinity buoy off the Stones, black, usual form; Hayle river buoys, black; floating (Herbert's) beacon, red.
 XIV. No.
 XV. No.
 XVI. Several memorials had been presented for a light to be placed on Godrevy on the Stones.
 XVII. Mariners are unanimous in their opinion as to the efficiency of the light on Godrevy; and if Herbert's beacon can be secured off the Stones it would be most desirable.
 XVIII. Have heard no complaints.
 XIX. Yes.
 XX. No.

Circular VI.

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No reply to Circular II.

SEATON HIGH LIGHT.—(SPECIAL RETURN.)

Circular III.

- I. Seaton High Light.
 II. Tees Conservancy Commissioners, Stockton-on-Tees.
 III. John Fowler, C.E., Stockton-on-Tees.
 V. Power was taken in the Tees Navigation Act of 1808.
 VI. The want of lights in the bay was generally acknowledged, but no special document is preserved.
 VII. In conjunction with the Low Light to lead vessels clear of Redcar rocks.
 VIII. 2d May 1839.
 IX. James Johnston, Engineer to Tees Navigation Company. Not built by contract.
 X. Sea light.
 XI. Columnar; built of stone; coated white.
 XII. Forked; composition metal.
 XIII. Sixty-eight feet.
 XIV. Ninety feet.
 XV. Twelve and a half miles.
 XVI. Fifteen miles.
 XVII. Eleven and a half degrees from S.E. $\frac{3}{4}$ E. to S.E. by E. $\frac{1}{4}$ E.
 XVIII. Fixed white light.
 XX. Sunset to sunrise.
 XXI. Catoptric.
 XXII. Two 21-inch parabolic reflectors.
 XXIV. W. Wilkins and Co., London.

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- XXV. One air funnel, 2½ inches diameter, turned with wind vane.
- XXIX. Cost of High and Low Lights, including dwelling houses and outbuildings, 1,432*l.* 1*8s.*
- XXX. An annual ground rent of 20*l.*
- XXXI. Lighting apparatus, fitting and ventilating, cost 140*l.*
- XXXIII. Average annual cost of repairs of building for five years, ending 31st March 1858, 2*l.* 13*s.* 6*d.*
- XXXIV. Coated once a year. Painting lantern and coating tower 6*l.*, by contract.
- XXXV. One keeper, 44*l.* 4*s.* per annum salary.
- XXXVI. Illuminating apparatus, about 60*l.*
- XXXVII. Repairs, &c. for 1857, 6*l.*; 1858, 5*l.* 9*s.* 6*d.*
- XXXVIII. Oil used in 1857, 99½ gallons; 1858, 99½ gallons. Wicks for 1857, 24 doz.; 1858, 24 doz.
- XXXIX. Refined rape or colza oil, price, 1857, 5*s.* to 5*s.* 6*d.*; 1858, 4*s.* 6*d.* to 5*s.*
- XL. Wick, thick cotton, 3½ inch long and 1 inch diameter, price 4*d.* per doz. Total each year, with carriage, 9*s.*
- XLII. The Tees Commissioners charge 1*d.* per register ton on every vessel entering the Tees, for the maintenance of the lights and beacons at the entrance of and in the Tees, paid with other river dues at the custom house.
- XLIII. The river tolls were leased in 1852. 1,300*l.* was allotted for maintenance of lights. Income for quarter ending 31st July 1858, 450*l.* 1*s.* 6*d.*
- XLIV. Expenditure for Tees lights in 1852, 948*l.* 11*s.* 10*d.*; expenditure for 1858, 735*l.* 15*s.* 6*d.* In the above expenditure is included the maintenance of river beacons, which are lighted from 1st October to 15th April, and cost 212*l.* 10*s.* in 1852, and 70*l.* 18*s.* in 1858; but the interest on the cost of construction is not included.
- XLV. Nil.
- XLVI. Nil.
- XLVII. Nil.
- XLVIII. Nil.
- XLIX. Nil.
- L. The lights are inspected by the Elder Brethern of the Trinity House, London, and by the Tees Commissioners and their Engineer.
- LI. The inspections by the engineer are monthly, the Commissioners also inspect frequently.
- LII. No.
- LIII. Two spare lamps and burners; oil stored at base of column.
- LV. No tide signals are used. All the light stations are some distance from the bar, consequently signals would be of little service when most required (during stormy weather).
- LVIII. See printed Form.

Circular III.

SEATON LOW LIGHT.—(SPECIAL RETURN)

- I. Seaton Low Light.
- VII. See High Light.
- VIII. 2d May 1839.
- IX. See High Light, Seaton.
- X. Sea light.
- XI. Octagonal; cottage roof; coated white.
- XII. See High Light.
- XV. Seven and three quarter miles.
- XVI. Ten miles.
- XVII. See High Light.
- XVIII. Fixed red light.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. Two 21-inch parabolic reflectors.
- XXIV. W. Wilkins and Co.
- XXV. Same as High Light.
- XXXI. A separate account was not kept.
- XXX. Annual ground rent of 10*l.*
- XXXI. Lighting, fitting and ventilating, apparatus, cost 100*l.*
- XXXIII. Average annual cost of repairs of building for 5 years ending 31st March 1858, 3*l.* 5*s.* 0*d.*
- XXXIV. Coated once a year; painting lantern and coating house, 3*l.* 10*s.*
- XXXV. Same as High Light.
- XXXVI. Illuminating apparatus; cost 60*l.*
- XXXVII. Repairs, &c. for 1857, 6*l.* 11*s.* 10½*d.*; 1858, 5*l.* 0*s.* 1½*d.*
- XXXVIII. Gas is burned in the light, about 37,000 feet is used per annum.
- XXXIX. Gas cost 4*s.* 2*d.* per 1,000 feet.
- LII. 20th September, want of water in meter, out 20 minutes.
- LIII. Two lamps kept ready trimmed; oil stored in light-room.

STOCKTON-ON-TEES.

BRANSAND HIGH LIGHT.—(SPECIAL RETURN.)

- I. Bransand High Light.
- VII. In conjunction with Low Light, to lead vessels from the fairway buoy over the bar to the second black buoy.
- VIII. 2d May 1839.
- IX. See High Light, Seaton; built by contract. John Anderson, contractor.
- X. Harbour light.
- XI. Timber; octagonal tower; covered with canvass, painted in black and white vertical stripes.
- XII. See Seaton High Light.
- XIII. Sixty-two feet. The answers to question XIII. to XVII. will vary according to the position of the tower upon the sand.
- XIV. Sixty feet.
- XV. Ten and a quarter miles.
- XVI. Eleven miles.
- XVII. 5½ degree. The Bransand High and Low Lights are moved to suit the alterations at their entrance; bearings range from N. by W. ¼ W. to N.N.E.
- XVIII. Fixed white light.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. One 21-inch parabolic reflector.
- XXIV. W. Wilkins and Co.
- XXV. Same as Seaton lights.
- XXXIX. Cost of High and Low Light towers, 1,539*l.* 4*s.* 9*d.*
- XXXI. Lighting, fitting, and ventilating, cost 55*l.*
- XXXIII. Average annual cost of repairs for 5 years, ending 31st March 1858, 10*l.*
- XXXIV. Painting outside and in, once a year, 10*l.* 10*s.*, by contract. The average annual cost of removing the towers for the 5 years ending 1858, was 83*l.* 6*s.* 0*d.*
- XXXV. One keeper, 60*l.* per annum salary.
- XXXVI. Illuminating apparatus, cost 35*l.*
- XXXVII. Repairs, &c. for 1857, 3*l.* 11*s.* 11*d.*; 1858, 3*l.* 3*s.* 5*d.*
- XXXVIII. Oil used in 1857, 47½ gallons; 1858, 44½ gallons. Wicks for 1857, 16 doz.; 1858, 14 doz.
- XXXIX. See Seaton High Light.
- XL. See Seaton High Light. Cost, 1857, 6*s.*; 1858, 5*s.* 3*d.*
- LII. 9th February 1855; keeper found dead at 12.30 a.m., and light out; severe frost.
- LIII. One spare lamp, and oil stored below lightroom.

BRANSAND LOW LIGHT.—(SPECIAL RETURN.)

- I. Bransand Low Light.
- VII. See High Light.
- VIII. 2d May 1839.
- IX. See High Light, Seaton. John Anderson, contractor.
- X. Harbour light.
- XI. Timber; octagonal tower; covered with canvass, painted in red and white horizontal stripes.
- XII. See Seaton High Light.
- XIII. Forty-nine feet. See High Light.
- XIV. Forty-eight.
- XV. Nine and one-sixth miles.
- XVI. Nine miles.
- XVIII. Fixed red light.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. One 21-inch parabolic reflector.
- XXIV. W. Wilkins and Co.
- XXV. Same as Seaton lights.
- XXXI. A separate account was not kept.
- XXXI. Lighting, fitting, and ventilating, cost 55*l.*
- XXXIII. Average annual cost of repairs for 5 years, ending 31st March 1858, 8*l.*
- XXXIV. Painting outside and in, once a year, 9*l.*, by contract. See High Light.
- XXXV. Same as High Light.
- XXXVI. Illuminating apparatus; cost 35*l.*
- XXXVII. Repairs, &c. for 1857, 6*l.* 9*s.* 1*d.*; 1858, 4*l.* 0*s.* 11*d.*
- XXXVIII. Oil used in 1857, 54½ gallons; 1858, 43½ gallons. Wicks for 1857, 16 doz.; 1858, 11 doz.
- XXXIX. See Seaton High Light.
- XL. See Seaton High Light. Cost, 1857, 6*s.*; 1858, 4*s.* 1½*d.*
- LII. 17th August 1858; light not lighted until 1 hour 20 minutes after time; keeper not at his duty.
- LIII. One spare lamp, and oil stored below lightroom.

TEES FLOATING LIGHT.—(SPECIAL RETURN.)

- I. Tees Floating Light. 5th buoy hole, river Tees.
- VII. To mark out safe anchorage, and a bend in the channel.
- VIII. 2d May 1839.

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- IX. See High Light, Seaton.
 X. Harbour Light.
 XI. Timber, painted red, lighthouse pyramidal.
 XII. No.
 XIII. Twenty-four feet.
 XIV. Twenty-four feet.
 XV. Six and a half miles.
 XVI. Seven and a half miles.
 XVII. The whole horizon.
 XX. Sunset to sunrise.
 XXI. Dioptric.
 XXII. 5th order.
 XXIII. On 27th September 1850, a dioptric apparatus of the 5th order was substituted for 4 catoptric argand lamps, and 9-inch spherical reflectors, suggested by Jas. Johnstone, C.E.
 XXIV. W. Wilkins and Co.
 XXV. Four copper funnels with pyramidal fluted revolving tops.
 XXVII. Fifteen days fogs are noted.
 XXX. Cost, including outfit, moorings, &c., 1,827*l.* 17*s.* 3*d.*
 XXXI. Lantern lighting, fitting, &c., cost 250*l.*
 XXXIII. Average annual cost of repairs (including moorings) of vessel, 5 years ending 31st March 1858, 89*l.* 8*s.* 6*d.*
 XXXIV. Painted once a year, sometimes twice outside average cost, 8*l.* 10*s.* per annum.
 XXXV. Two keepers, at 75*l.* and 47*l.* per annum.
 XXXVI. Illuminating apparatus; cost 120*l.*
 XXXVII. Repairs, &c. for 1857, 6*l.* 19*s.* 8*d.*; 1858, 4*l.* 7*s.* 10*d.*
 XXXVIII. Oil used in 1857, 62½ gallons; 1858, 54½ gallons. Wicks for 1857, 16 doz.; 1858, 12 doz.
 XXXIX. See Seaton High Light.
 XL. See Seaton High Light. Cost, 1857, 6*s.*; 1858, 4*s.* 6*d.*
 LIII. No.
 LIV. One spare lamp, and spare burner to each lamp. Eight small spare lamps, and 16 wax candles in lightroom; oil stored below lightroom.
 LV. Barometer and thermometer.
 LVI. Blue lights by night, and flag signals by day.
 LVII. Keepers relieved every alternate Sundays, and one day in each week.

BACK LIGHT TO FLOATING LIGHT.

(SPECIAL RETURN.)

- I. Back Light to Floating Light, situated at Eston.
 VII. In conjunction with the Floating Light to lead vessels from the 2nd black buoy to the 5th buoy pool.
 VIII. 24th October 1848.
 IX. See High Light, Seaton.
 X. Harbour light.
 XI. Beacon, painted black, and white lantern.
 XII. No.
 XIII. Fifty feet.
 XVI. Seven and a half miles.
 XVII. Five and three quarter degrees from N.E. by N. ¼ E. to N.E. by N. ¾ E.
 XX. Sunset to sunrise.
 XXI. Catoptric.
 XXII. One 21-inch parabolic reflector.
 XXIV. W. Wilkins and Co.
 XXV. Space between roof and sides of lantern.
 XXX. 4100.
 XXXI. Lantern, lighting apparatus, fitting, &c.; cost 45*l.*
 XXXIII. Average annual cost of repairs for 5 years, ending 31st March 1858, 1*l.* 10*s.*
 XXXIV. Once a year, average cost 1*l.*
 XXXV. One keeper, 40*l.* per annum.
 XXXVI. Illuminating apparatus, cost 29*l.*
 XXXVII. Repairs, &c. for 1857, 2*l.* 9*s.* 9*d.*; 1858, 2*l.* 9*s.* 9*d.*
 XXXVIII. Oil used in 1857, 62½ gallons; 1858, 62½ gallons. Wicks for 1857, 10 doz.; 1858, 11 doz.
 XXXIX. See Seaton High Light.
 XL. See Seaton High Light. Cost, 1857, 3*s.* 9*d.*; 1858, 4*s.* 1½*d.*

RULES AND INSTRUCTIONS for the LIGHT-KEEPERS employed by the CONSERVANCY COMMISSIONERS.

- The lamps shall be kept burning bright and clear every night from sunset to sunrise; and in order that the greatest degree of light may be maintained throughout the night, the cottons are to be trimmed every four hours, or oftener if necessary.
- The light-keeper shall keep a regular and constant watch during the night.
- Immediately after the lights are extinguished in the morning, the lamps, reflectors, chimneys, and lantern

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glass are to be carefully cleaned, the lamps supplied with oil and cottons, and every thing is to be put in a state of readiness for lighting in the evening.

4. Particular attention is to be paid during damp or frosty weather to prevent the light being obscured by haze accumulating upon the lantern glass.

5. The light-keeper shall be held responsible for the safety and good order of the stores, utensils, and apparatus of what kind soever under his charge; he must take care that none of the stores or materials are wasted, and shall observe the strictest economy and the most careful management, yet so as to maintain in every respect the best possible light.

6. Each light-keeper is, every morning, to examine the shore between the points specified in his particular instructions, and if any buoys, beacons, or other materials belonging to the Commissioners have been left upon the beach, he is to make the same fast or transport to a place of safety, and report to the engineer.

7. He is likewise to take notice when and in what manner any damage may occur to any part of the Commissioners' property, and although it may not be under his immediate charge, he is to report the same at the earliest opportunity to the engineer.

8. The light-keepers are also required to take notice of any accident that may occur to vessels of any description when navigating the Tees, and to report the same to the engineer.

9. The light-keeper shall endeavour to keep in a proper state of repair, the light beacons, and all other things under his charge.

10. He shall be at his station at least one hour before the proper time of lighting.

11. He is further required to report to the engineer any neglect of duty (at the time of its occurrence) by himself or others.

All stores to be entered in the journal, along with any remark as to their quality, at the time of being received; any article or thing connected with the light beacons being damaged or lost to be entered immediately in the journal, and reported to the engineer at the first opportunity.

JOHN FOWLER, Engineer.

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Circular III.

LIGHTHOUSE.—(SPECIAL RETURN.)

- Harbour Lights, Port of Sunderland.
- Trinity House of Newcastle.
- Commissioners of the River Wear.
- Two lighthouses, on the extremities of north and south piers of harbour entrance, about 400 feet apart. See Signal and Sailing Directions, marked No. 5.
- Not known, from antiquity of lighthouse.
- Not known, from antiquity of lighthouse.
- Because it was the most seaward point of the piers at the entrance of the harbour.
- Not known, from antiquity of lighthouse.
- Present lighthouse on north pier, Pickernill, Engineer and Builder. No contract. Built by Wear Commission. Present lighthouse on south pier, Meik, Engineer. Built by contract.
- North pier lighthouse, third order harbour light. South pier lighthouse, fifth order harbour light.
- North pier lighthouse, material stone. Solid masonry. With paint. Light stone colour. South pier lighthouse. Material wrought iron, with paint. Light stone colour. See views of lighthouses.
- None.
- North pier lighthouse 84 feet. South pier lighthouse 57 feet.
- North pier lighthouse 78 feet above high-water. South pier lighthouse 58 feet above high-water.
- North pier lighthouse 14 to 16 miles. South pier lighthouse 4 to 5 miles.
- North pier lighthouse 144 degrees, or from N.N.E. ¼ E. to S. ¾ E. South pier lighthouse 130 degrees, or from N.N.E. ¼ E. to S. ¼ E.
- North pier lighthouse, a bright fixed white light. South pier lighthouse, a bright fixed white light.
- North pier lighthouse, from sunset to sunrise throughout the year. South pier lighthouse, at tide time. See Sailing Directions, marked No. 5.
- North pier lighthouse, catadioptric. South pier lighthouse, catadioptric.

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- Circular III.** XXII. North pier lighthouse, third order, 1 burner. South pier lighthouse, fifth order, 1 burner.
- XXIII. North pier lighthouse, formerly nine Argand burners, with ordinary reflectors; altered in the autumn of 1858 to the present light at Thomas Meik, the engineer's, suggestion. South pier lighthouse, formerly five Argand burners with ordinary reflectors, altered to present light at the suggestion of Thomas Meik, the engineer, in the autumn of 1856.
- XXIV. Both lights by Chance Brothers, Birmingham.
- XXV. Inverted funnel above light, and admission of cold air below.
- XXVI. Common bell at present used, but found very defective.
- XXVII. Twelve days.
- XXVIII. No register kept.
- XXIX. North pier lighthouse not known. South pier lighthouse 750*l*.
- XXX. Both lighthouses are completely finished.
- XXXI. North pier lighthouse not known. South pier lighthouse 100*l*.
- XXXII. Always belonged to Commissioners.
- XXXIII. North pier lighthouse about 5*l*., done by Commissioners' painter. South pier lighthouse about 5*l*., done by Commissioners' painter.
- XXXIV. See answer XXXIII.
- XXXV. North pier lighthouse, onc, 60*l*. per annum, with house and firing. South pier lighthouse, onc, 70*l*. per annum, with house and firing.
- XXXVI. North pier lighthouse, cost and fitting 300*l*. South pier lighthouse, cost and fitting 100*l*.
- XXXVII. North pier lighthouse 2*l*. South pier lighthouse 2*l*.
- XXXVIII, XXXIX, XL. Both lights lighted with gas.
- XLI. Bell attached to lighthouse.
- XLII. Pier and harbour light levied by Commissioners of River Wear, payable at Custom House.
- XLIII. Midsummer quarter, 1858, 41*l*. 17*s*. 2*d*.; 1852, 317*l*. 4*s*. 4*d*.; total 1852, 1,154*l*. 11*s*. 8*d*.
- XLIV. 1852, 342*l*. 2*s*. 1*d*.; 1858, 288*l*. 19*s*.
- XLV. No complaint.
- XLVI. No complaint.
- XLVII. No complaint.
- XLVIII. No complaint.
- XLIX. No complaint.
- L. By the River Wear Commissioners.
- LI. In month of July each year.
- LII. No.
- LIII. A number of spare burners are on the Commissioners' premises.
- LIV. See published Signals and Instructions (a copy forwarded, marked No. 4.)
- LV., LVI. See published Signals and Instructions (a copy forwarded, marked No. 3.)
- LVII. No necessity for relieving keepers.
- LVIII. See Signal Book, marked No. 4.
- No. 5. Accompanying Answers to Queries of Royal Commission on Lights, Buoys, and Beacons.

NORTH PIER LIGHTHOUSE.

On the north pier is erected a lighthouse (lat. 54° 54' N. lon. 1° 21' 16" W.) showing a bright fixed light, 78 feet above high-water mark, ordinary spring tides. In addition to this light there is a red distinguishing light, 18 feet below it. Both lights are exhibited from sunset to sunrise throughout the year.

This stands No. 82 on the list of lights visited or seen afloat, and was visited on the 1st of August. The lighthouse is of stone, and was moved more than 300 yards, when the pier was lengthened, though over 300 tons weight. The dwelling-house is at a considerable distance from the lighthouse. The light is produced by burning gas, burners double with numerous orifices, illuminating apparatus half-circle beehive-top-dioptric, no reflectors behind the apparatus, but a reflector of zinc below. There was no spare lamp. There is one keeper, who is paid 17*s*. a week; he stated that he had a separate gasometer, in which he always kept three or four nights' supply of gas from the main, and that he was able to regulate the pressure himself. The keeper is assisted by his wife and daughter.

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The tide light also was examined it indicates the depth of water on the bar by day and by night, by figures painted on a web of gauze wire, which is moved by a float in a well communicating with the sea. It was out of order, and not working at the time of the visit. It is a self-registering apparatus, and curves representing former observations were shown.

SOUTH PIER LIGHTHOUSE.

On the south pier is an iron lighthouse, upon which is shown a tide light, 58 feet above high water of ordinary springs, and 20 feet below the level of the fixed light on the north pier, from half flood to first quarter ebb, when the wind and tide are favourable for entering the harbour; but with a westerly wind, the light is put out at high water. A green light and blue lights are sometimes shown below the tide light, as explained on the plate.

This lighthouse has lately been erected directly behind, or to the westward of, the site of the old one, and has a powerful catadioptric bright light of the fifth order, and illuminates seaward an arc of the horizon extending from the north pier lighthouse on the north to the south beacon on the south, or an arc of 130°.

In the fairway track the south pier light is at present visible a distance of from three to four miles.

In the daytime a flag is hoisted on the south pier lighthouse half-mast high, when there is a depth of eight feet water on the bar; it is hoisted to the mast head, when there is a depth of 10 feet, with a smooth sea, and continued till high water, with a westerly wind; and it is kept up one hour and a half after high water, with the wind from S.S.E. to N.N.E.

An auxiliary flagstaff has been erected on this pier, on which signals are made to vessels running for the harbour with risk after the lighthouse flag has been lowered. The signals from this flagstaff are described on the plate of signals at the beginning of this pamphlet.

This auxiliary flagstaff is 16 feet south of the lighthouse. Blue lights are exhibited every quarter of an hour during the night at tide time, when the weather is stormy and the harbour dangerous to enter. In foggy weather a bell or gong is sounded at intervals of a quarter of an hour for the guidance of vessels.

This stands No. 81 on the list of lights visited or seen afloat. It was visited on the 30th of July, by the tower is of iron, and the reflectors of white porcelain; the light is produced by burning gas; there is a small lens in front. It is said to be a very good light, and should be inexpensive. The tide light placed behind the south-pier light, was twice inspected. The principle of this tide signal is more fully referred to elsewhere.

BUOYS AND BEACONS.

- I. Commissioners of the River Wear and Port and Haven of Sunderland
- II. The accompanying chart, No. 1, shows buoys placed at sea to mark the limit of casting ballast. Also on the same chart is shown the extent of the Commissioners of River Wear jurisdiction seaward. The cost of maintaining those buoys in 1852 was 120*l*. 15*s*. 5*d*., and in 1858 was 82*l*. 14*s*. 7*d*.. Also on the same chart is shown a buoy 1½ miles south of the harbour mouth, maintained by the Sunderland Dock Company, showing the position of a sunken rock. The cost of maintaining it in 1852 was 4*l*. 11*s*., and in 1858 was in charge of the Sunderland Dock Company. Also on the same chart are shown two beacons fixed on the north and south rocks at their seaward low water margin. Their cost of maintenance in 1852, was 6*l*., and in 1858, 22*l*. 19*s*. 11*d*.. Total number of buoys, six; total number of beacons, two.
- III. The Admiralty.
- IV. None.
- V. See accompanying drawing of buoy, marked No. 2.
 - a. Iron.
 - b. 30*l*.
 - c. 2*l*.
 - d. 10*s*.
 - e. Five.
 - f. Two.
 - g. Commissioners' premises.

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- h. Two.
 - i. One.
 - j. Stormy weather.
 - k. Very large stones and heavy chain.
 - l. 10l.
 - m. By Commissioners of the River Wear.
 - n. By large letters painted on them.
 - o. Three.
- VI. Iron, oval-shaped.
 - VII. Generally overhauled or changed every summer.
 - VIII. Surveyed as to their state and position every summer.
 - IX., X. The two beacons here are merely single baulks of timber with distinguishing heads, and standing about 12 feet above high-water spring tides.
 - XI. All buoys here are now iron ones, substituted for wooden ones.
 - XII. Not necessary.
 - XIV., XV. From General Revenue of the Commissioners of the River Wear, and the buoy on Hendon Rock by the Sunderland Dock Company.
 - XVI. No special income for maintenance of buoys or beacons. The expense incurred in 1852 was 131*l.* 6*s.* 5*d.*, and in 1858, 105*l.* 14*s.* 6*d.*
 - XVII., XVIII. None.
 - XIX. The Commissioners of River Wear.
 - XX. Same as answer XIX.
 - XXI. By advertising the same in the local newspapers and "Shipping Gazette."
 - XXII. It is always replaced as soon as the weather permits.
 - XXIII. Never has been found necessary.
 - XXIV. None within the date.
 - XXV. See sketeb, marked No. 2.
 - XXVI. See printed Notices, Sailing Directions, &c. issued by the Commission, marked No. 4.
 - XXVII. None.

lar VI.

LLOYD'S EVIDENCE.

- I. James Crosby, 19, Tyler Street, Bishopwearmouth, ship broker, &c.
 - II. SUNDERLAND.
 - III. Commissioners of the River Wear, and docks.
 - IV. Yes.
 - VII. Gas and oil.
 - VIII. No.
 - IX. No.
 - XI. A fixed light on the north pier, and a tidal light on the south pier.
 - XII. A signal bell attached to the South Pier Lighthouse.
 - XV. One farthing per ton for the two lighthouses belonging to the Wear Commissioners; one shilling per ship, payable to the Trinity House of Newcastle, in respect of the Tyne Lighthouse, on the Tyne, from which this port receives no advantage; one shilling per ship levied on vessels trading to a port north of Warkworth, for the support of buoys belonging to the Trinity House.
 - XVIII. A very strong feeling against the dues payable to the Newcastle Trinity House, no benefit being derived.
 - XX. Except as above.
- I. Ralph M. Hudson, shipowner and broker, Sunderland.
 - II. SUNDERLAND.
 - III. Harbour lights belonging to the "Commissioners of the River Wear."
 - IV. Sufficiently.
 - VII. Gas and oil.
 - IX. Occasionally.
 - X. None.
 - XI. A local light on one pier, and fixed light on the other.
 - XII. A signal bell, and attached to the tidal light.
 - XV. Yes; three tolls, as follows:—1. One farthing per ton for the two lighthouses belonging to the River Wear Commissioners; 2. An average of one shilling per ship on all vessels, payable to the Trinity House, Newcastle, in respect of the two lights shown on the Tyne, from which the trade of this port receives not the slightest benefit; 3. One shilling per ship levied on vessels trading to or from port north of Warkworth, for the support of buoys belonging to the said Trinity House.
 - XVIII. A strong feeling against the dues payable to the Trinity House, Newcastle, no adequate benefit being derived.
 - XX. See reply above, as to the Trinity House, Newcastle.

73. TALBOT PORT.

TALBOT
PORT.
Circular VI.

CLAUSE referring to Limits of PORT TALBOT. Act of Parliament passed 4th July, 1836:

And be it further enacted, that for the purposes of the said recited Act and of this Act, the limits and boundaries of Port Talbot aforesaid shall extend over and include the docks, cuts, canals, and other works by this Act and the said recited Act authorized to be made; and, also, the whole of the lands covered by the tide at the time of high water lying on the land side of the point where the River Avon passes between the sand banks on the sea shore known as the Margam and Aberavon Burrows; and, seaward of such point, shall extend to low water mark, and to the extent of one mile on the south side and two miles on the north side of a straight line to be drawn due west from the centre of the River Avon where it passes between the sand banks to low-water mark.

PORT TALBOT LIGHTHOUSE.—(SPECIAL RETURN.) Circular III.

- I. Port Talbot.
- II. No light at this port.
- IV. The lighthouses in the vicinity are the Mumble lighthouse, and a tidal light on Swansea west pier, both (I believe) under the control and management of the Commissioners of Swansea Harbour.

BUOYS AND BEACONS.

Circular V.

- I. The Harbour Master of Port Talbot.
- II. There are no buoys or beacons except as described below. The cost of them is very trifling, and form part of the general expenses of the port. See enclosed map and clause of Act of Parliament.
- III. To the Port Talbot Company constituted under three Acts of Parliament passed respectively June 1834, July 1836, June 1840.
- IV. There is no intermediate party between the harbour master and the Port Talbot Company.
- V. There are eight buoys marking the entrance to this harbour, viz., four buoys painted black on south side or starboard hand on entering the harbour, and four buoys painted red on the north side or port hand on entering the harbour. The buoys which are of small value, are all made of wood, barrel shaped, 1 foot 10 inches long, 1 foot 4 inches diameter; moored by stones buried in the sand at low water, at which time the buoys are all dry. There are four buoys with moorings complete, of each colour, kept in reserve at the harbour office for replacing those in position in case of accident or loss. This port is not entered or left by vessels at night.
- VI. This does not apply to Port Talbot.
- VII. No period fixed for overhauling buoys, as their condition is seen daily at low water, and frequently examined.
- IX. The only building, approaching the description of a beacon in connexion with this harbour, is a tower painted white on the outer end of the breakwater, 30 feet above high water spring tides, erected in 1843, to point out the position of the harbour to vessels in the offing; it has no lights connected with it; built of stone.
- XIV. Buoys maintained by the Port Talbot Company, out of their revenue arising from tolls levied on vessels entering the port.
- XVII. No applications have been made; the charges are very trifling; they are superintended by the harbour master.
- XXII. The harbour master.
- XXIV. None have been made.
- XXVI. Copy of tide table sent herewith.

LLOYD'S EVIDENCE.

Circular VI.

- 1. William Llewellyn Powell, agent for Lloyd's for the district from (and including Neath) to the Nash Point, Taihuach, Glamorganshire, merchant.
- II. PORT TALBOT IN SWANSEA BAY.
- III. I am not aware of any for the bay; the harbour master has the control and disposition of the buoys of the port (Port Talbot).
- IV. The agent at Swansea and harbour master there are the most competent to answer this question for the bay, but I consider a light on the west end of the Skerweathers absolutely necessary.
- VI. A floating light on the west end of the Skerweather Sands.

- TALBOT PORT.**
Circular VI. VII. Oil in the Mumble Lighthouse.
 VIII. Not aware.
 X. I could name several vessels lost in the bay, but shall mention particularly the barque Sunda, of Jersey, lost the 5th of November last on Margam Sands, and I have no hesitation in saying that if there had been a light on the west end of the Skerweathers she would not have been wrecked.
 XIII. One beacon (a barrel post) and ten small buoys, red and black; the beacon and black buoys are left on the starboard hand, and the red buoys on the larboard hand on entering the port.
 XIV. No.
 XV. None.
 XVII. The general opinion among the seafaring men of this port, and ports adjacent, is, that a light has long since been required on the west end of the Skerweather Sands.

- Circular VI.** I. William Jenkins, acting harbour master, Port Talbot, Glamorganshire.
 II. PORT TALBOT.
 III. Port Talbot Harbour Company keeps the bar buoyed and beaconed.
 IV. Port Talbot bar is kept well buoyed. A light on the west end of the Scarweather Sands would be very desirable.
 XIII. At Port Talbot bar there are four red buoys on the north side of the channel, and four black buoys on the south side of the channel leading in to the harbour (cask buoys) in entering the red buoys to be left on the port side and black buoys on the starboard side.
 XIV. None.
 XV. None, except dock dues, which is 3d. per register tonnage on vessels entering the harbour, paid to the harbour company, who keep the channel buoyed.
 XVI. I have not heard of any.
 XVII. I have heard no complaints.

74. TEIGNMOUTH.

LIGHTHOUSE.—(SPECIAL RETURN.)

- TEIGNMOUTH.**
Circular III. I. Teignmouth; Devon.
 II., III., IV. The only lighthouse is a small one to show the mouth of the harbour. Maintained by the Harbour Commissioners. It was erected in the year 1845.
 V. In 1843. The Commissioners, of their own motion, resolved to erect this lighthouse.
 VII. In order to point out the mouth of the harbour.
 VIII. Dec. 1844.
 IX. Hexter, builder. Work done by contract.
 X. Harbour.
 XI. Stone; solid.
 XII. No.
 XIII. Twenty-four feet.
 XIV. Forty feet.
 XV. Seven miles.
 XVII. S.S.E.
 XVIII. Fixed; red light.
 XX. All night.
 XXI. Three gas burners, with reflectors.
 XXIV. Furze, Teignmouth.
 XXV. Open grating.
 XXVI. None.
 XXIX. Lighthouse, 108l.; site, 5l.
 XXXI. 53l. 7s.
 XXXIII. Nothing but a little painting of lantern.
 XLII. Maintained by the Commissioners.
 LV. None.

BUOYS AND BEACONS.

- Circular V.** I. The Clerk of the Teignmouth Harbour Commissioners, Teignmouth, Devon.
 II. to V. There are no buoys in this harbour, besides those under the control of the Commissioners alone and these are Porter's patent screw moorings. The Commissioners presume that these are not the buoys referred to by the queries.
 X. There are none other than the lighthouse at the mouth of the harbour mentioned in the accompanying paper.

TEIGNMOUTH and ULVERSTONE.

LLOYD'S EVIDENCE.

- I. John S. Clapp, Teignmouth, shipowner.
 II. TEIGNMOUTH.
 III. Teignmouth Harbour Commissioners.
 IV. Yes.
 V. Not any.
 VII. Coal gas.
 IX. The shipping in the harbour of Teignmouth ride at screw moorings. The buoys are sometimes breaking adrift, and in several instances, even since a diver from Plymouth examined them, and they were repaired, the chains have broken, and the ships have grounded. One of my vessels narrowly escaped damage. I consider the screw moorings unsafe, and am favourable to mooring in the bridle of a chain, as they can at all times be underrun and examined, the ground on either side the deep water channel being dry at low water.
 XI. None wanted.
 XII. None required.
 XV. Twopence per ton paid to the Harbour Commissioners.
 XIX. I know nothing to the contrary.

- I. Henry Warren, Teignmouth, merchant, shipowner, Lloyd's agent.
 II. TEIGNMOUTH.
 III. Harbour Commissioners.
 IV. Yes.
 V. Buoys sufficient; harbour light not good.
 VII. Gas.
 VIII. Since erected, the light has been well attended to; no accident has been known to occur.
 IX. The screw mooring chains in the harbour parted in November 1859, not since replaced.
 X. Not aware of any during 15 years.
 XI. Not used.
 XII. Not any used.
 XIII. Black conical buoys to the harbour moorings at equal distances; warping buoys, barrel shaped, at low-water mark.
 XIV. No.
 XV. Twopence per register ton paid to the Harbour Commissioners.
 XVI. Not any of consequence.
 XVII. Harbour light considered not sufficient; harbour well buoyed.
 XVIII. Dues on ships not considered heavy.
 XIX. Generally so.

- I. S. W. Hutchings, shipowner, Teignmouth, Devon.
 II. TEIGNMOUTH.
 III. Teignmouth Harbour Commissioners.
 IV. Yes.
 V. All efficient.
 VII. Gas.
 VIII. Not aware of any.
 IX. On 26th November 1859, two chains attached to screw moorings parted close to the ground; ships went ashore, not injured. Chains not yet replaced; waiting for a diver.
 X. None.
 XI. Not required.
 XII. Not required.
 XIII. Black bell buoys.
 XIV. No.
 XV. Twopence per ton to Harbour Commissioners.
 XVI. None.

75. TREGUNTER.*

76. ULVERSTONE.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Ulverstone.
 III. Ulverstone Canal Company.
 X. One lamp on the pier at the entrance to the canal.
 XIV. Fourteen feet.
 XV. Twenty miles.
 XVI. Twelve miles.
 XX. From half flood to a quarter ebb.
 LV. On a signal post at the pier. A blue flag from half flood to high water by day; the lamp by night. (See Question XX.)

ULVERSTONE and WELLS.

BUOYS and BEACONS.

- I. The Ulverstone Canal Company.
 II. The Company have no charts. The position of the buoys is fluctuating with the channel, which frequently changes in Morecombe Bay. The cost of maintenance is given in answer to Question XVI. Twelve buoys; 16 beacons.
 III., IV. No.
 V.
 a. Oak.
 b. From 15*l.* to 25*l.*
 c. No separate account kept of the repair of each buoy.
 d. Not painted; tarred.
 e. Five nun buoys; two can buoys.
 f. Two can buoys; three nun buoys.
 g. At canal foot stores.
 h. Five buoys with chains and stores.
 i. Nine buoys.
 j. By vessels striking, and stormy weather.
 k. With large stones and chains.
 l. None moored in five fathoms low water.
 m. Repaired at our shop by the Company.
 n. Numbered.
 o. Eight at present.
 VI. Can buoys.
 VII. One year.
 VIII. Periodically by the pier master.
 IX. The only beacons put up by this authority, are perches on the different scars and rocks in the bay.
 X.
 a. Perches.
 b. Not known. Before this authority put up perches, private individuals did so for 50 years.
 c. As a beacon to warn vessels off sunken rocks.
 d. A large bush of furze on the top, which can be seen at a great distance.
 e. Larch and spruce.
 f. Natural.
 g. None.
 h. Twelve feet.
 j, k. Included with the buoys.
 XI. None.
 XII. In the deepest water in the run of the fresh water channels.
 XIII. Wherever there is a rock or scar within the limits of this authority dangerous to navigation.
 XIV. By a register tonnage rate of $\frac{3}{4}$ *d.* per ton on vessels trading to Ulverstone; payable to the Canal Office.
 XVI. Income, 1852, 115*l.* 13*s.* 2½*d.*; Midsummer quarter, 29*l.* 0*s.* 5½*d.* Income, 1858, 59*l.* 16*s.* 11*d.*; Midsummer quarter, 14*l.* 19*s.* 8*d.* Expenditure, 1852, 150*l.*; 1858, 80*l.*
 XVII. None.
 XVIII. None.
 XIX. By the pier master. 1857—February, April, July, September, and November. 1858—January, May, July, October, and November.
 XX. Pier master, whenever necessary. No particular dates recorded.
 XXI. None.
 XXII. Yes. The pier master as soon as the weather permits.
 XXIV. None.
 XXV. None.
 XXVI. None.

77. WELLS.

LLOYD'S EVIDENCE.

- I. Robert London, late a master mariner and now a ship broker, Wells.
 II. PORT of WELLS.
 III. The Harbour Commissioners.
 IV. A light on the Inner Dowsings would be very useful.
 V. Well arranged.
 VI. A light on the north east end of the Inner Dowsings would be very useful for ships bound up Lynn Well.
 VII. No lights.
 VIII. Nil.
 IX. Nil.
 X. Vessels leaving the Lincolnshire coast bound to the southward frequently get set up of Lynn Well by the flood tide and come on shore by course

WELLS and WEYMOUTH.

between Wells and Blakeney. A light on the Inner Dowsing would show them their position and prevent them.

- XI. Nil.
 XII. Nil.
 XIII. Fairway or sea buoy red on the bar chequered on the west side of harbour black, east side, white.
 XIV. Require no alteration.
 XV. Nil.
 XVI. Nil.
 XVII. That a light on the Inner Dowsing would be of great service.
 XVIII. Very satisfactory.
 XIX. Yes.
 XX. Not aware. The above answers are the general opinion of ship owners and master mariners belonging to the port of Wells.
 I. Robinson Parker, and Son., Lloyd's and General Shipping Agents. Circular VI.
 II. The PORT of WELLS.
 III. The Harbour Commissioners.
 IV. No, decidedly not, we have no light from Hunstanton on the west (18 miles distant) to Cromer on the east, (22 miles distant) a distance of forty miles, and one is much required.
 V. None required.
 VI. Somewhere near this port, as the medium distance between Hunstanton and Cromer.
 VII. When vessels require lighting up the harbour candles only are used.
 VIII. No.
 IX. No.
 X. Principal of the accidents which occur near to this, are believed to be attributable to want of a light, combined with the unaccountable inset of the tide on this coast.
 XI. No tide signals.
 XII. No fog signals now here.
 XIII. Fairway buoy at sea, red; on the bar, chequered west of harbour, black, east of harbour, white.
 XIV. No.
 XV. No.
 XVI. We are not aware of any in our capacity as Lloyd's agents.
 XVII. We feel assured that a light is much required.
 XVIII. We are not aware of any dissatisfaction.
 XIX. We believe so, but we know not.
 XX. We are not.

78. WEYMOUTH.

BUOYS and BEACONS.

- I. John Pearce, Harbour-master, Weymouth.
 X.
 a. The harbour light.
 b. 29th May, 1858. The original position of the harbour light was on the south pier-head, from which the present light bears N.E. about 100 yards.
 c. The frame of the lamp is of iron, and it rests on four piles driven into the bed of the sea.
 f. Red.
 g. Lighted by night with gas.
 h. Seventeen feet.

LLOYD'S EVIDENCE.

- I. George Arden, Weymouth, Dorset, Lloyd's Agent.
 II. WEYMOUTH.
 III. The Mayor and town council of the borough.
 IV. The light at the entrance of the harbour is not always in an efficient state where there is a shoal.
 V. None.
 VI. None.
 VII. Gas.
 VIII. See answers IV., X., XVI.
 IX. See above.
 X. Accidents have happened, but not very recently.
 XI. None.
 XII. None.
 XIII. The buoys and beacons are black and placed where considered much wanted.
 XIV. No.
 XV. None.
 XVI. Four or five vessels have been ashore on the before mentioned shoal, during the last three or four years of which complaints have been made to the Town Council and attended to.
 XVII. See answer No IV.

- WEYMOUTH.**
Circular VI.
- WEYMOUTH and WHITBY.**
- I. William Roberts, Weymouth, late master mariner, Dorset.
 - II. **WEYMOUTH.**
 - III. A light on the extremity of a danger at the entrance of the Harbour, most inefficiently lighted. This light is kept by the corporation of this place for which no dues are levied on any shipping entering this port.
 - IV. Well lighted with the exception of the above-named light.
 - VII. Gas.
 - VIII. The before-mentioned light, several times altogether extinguished during the last three months.
 - X. Several accidents on the before-mentioned shoal from the want of proper beacons.
 - XVI. Four or five vessels have been on shore on the before-mentioned shoal during the last three or four years, of which complaints have been made to this corporation.
 - XVII. The before-mentioned light very inefficient.

WHITBY.**79. WHITBY.***(For the Whitty Return see page 424.)***LLOYD'S EVIDENCE.**

- Circular VI.
- I. Thomas Jones, West Cliff, Whitby, Lloyd's agent, and shipbroker.
 - II. **WHITBY.**
 - III. William Tase, Harbour-master for the Port of Whitby, Captain Gatenby for Whitby High lights, a little south of Whitby; both residing at Whitby.
 - IV. Yes.
 - V. None.
 - VI. None.
 - VII. Whitby tide lights, gas. Whitby High lights, oil.
 - VIII. None.
 - IX. None.
 - X. None.
 - XI. A red flag on the West Cliff when eight feet water over the bar, by day; and two tide lights, one on each pier-head, entrance to the harbour, lit when eight feet water, &c. as above.
 - XII. None.
 - XIII. Rock buoy, black; can buoy.
 - XIV. None.
 - XV. None.
 - XVI. None.
 - XVII. Good.
 - XVIII. Moderate.
 - XIX. Yes.
 - XX. None.

Circular VI.

- I. William Tase, West Cliff, Whitby, Harbour-master.
- II. **WHITBY.**
- III. For the Port of Whitby, William Tase, Harbour-master.
- IV. Yes.
- V. None.
- VI. None.
- VII. Gas in the Port of Whitby; oil in Whitby High lights.
- VIII. None.
- IX. None.
- X. None.
- XI. A flag shown on the West Cliff, when eight feet water over the bar; and two tide lights at night (charge of the harbour-master), denotes the same.
- XII. None.
- XIII. Rock buoy, black.
- XIV. None.
- XV. None.
- XVI. None.
- XVII. Good.
- XVIII. Very good.
- XIX. Yes.
- XX. None.

Circular VI.

- I. Thomas Foxton, West Cliff, Whitby, Secretary to Esk Insurance Association.
- II. **WHITBY.**
- III. Captain Gatenby, Whitby.
- IV. Yes.
- V. None.
- VI. None.
- VII. Gas in the port. Oil in Whitby High lights.
- VIII. None.
- IX. None.

WHITBY and WHITSTABLE.

- X. None.
- XI. A flag shown on the West Cliff, when 10 feet water is on the bar.
- XII. None.
- XIII. Rock buoy black; can buoy.
- XIV. None.
- XV. None.
- XVI. None.
- XVII. Good.
- XVIII. Moderate.
- XIX. Yes.
- XX. None.

*(For Return see page 424.)***80. WHITSTABLE.****LIGHTHOUSE.—(SPECIAL RETURN.)**

- I. Whitstable.
- II. The South-eastern Railway Company.
- III. Captain Edward Paul, Harbour and Station Master.
- IV. One light fixed on the side of a lofty chimney.
- VI. Mr. Stevens, Whitstable.
- VIII. About nine years ago.
- X. Sea light and harbour light. The light bearing south is a fairway between the Columbine buoy and Street buoy.
- XI. Brick and mortar.
- XII. None.
- XIII. Fifty feet.
- XIV. Fifty-six feet.
- XV. Nine miles.
- XVIII. Fixed light, gas.
- XX. From dark to daylight.
- XXII. One burner, one reflector.
- XXV. A small chimney on the top.
- XXXI. 3 feet by 2 feet. Cost 12*l*.
- XLII. Ship pay one farthing per register ton to the South-Eastern Railway Company for the light and for lighting the harbour.
- LV. A red flag half mast 10 feet. A red flag half mast with ball under, 11 feet. A red flag half mast with ball over, 12 feet. A red flag at mast head, exceeding 12 feet.

LLOYD'S EVIDENCE.

- I. Philpot Wood, Lloyd's agent, Whitstable.
- II. **WHITSTABLE, PORT of FAVERSHAM.**
- III. Trinity House, London, for the Channel buoys and lights, and the South-Eastern Railway Company the harbour light.
- IV. Yes.
- VII. The harbour light, gas.
- XIII. Red on the Columbine or north side, and black on south side.
- XIV. No.
- XV. One farthing per ton for buoyage to the South Eastern Railway Company.
- XVII. Sufficiently lighted and buoyed.
- XVIII. Generally satisfied.
- XX. I am not.

- I. William Kemp, master mariner, Whitstable.
- II. **WHITSTABLE.**
- III. Trinity House, London; South-Eastern Railway.
- IV. Yes.
- XIII. Red on the north side, black on the south.
- XIV. No.
- XV. Farthing per ton per voyage to South-Eastern Railway Company.
- XVII. Sufficient.
- XX. I am not.

- I. Edward Adams, Whitstable, master mariner.
- II. **WHITSTABLE, PORT of FAVERSHAM.**
- III. Trinity House, London. South-Eastern Railway.
- IV. Yes.
- VII. Harbour light, gas.
- XIII. Red on the north side (or Columbine). Black on the south (Whitstable Street, and Spit of Pollard).
- XIV. No.
- XV. One farthing per register ton per voyage. South-Eastern Railway Company.
- XVII. Sufficient.
- XVIII. Excessive.
- XX. I am not.

81. WING, Sir B. P., Bart.—(ILFRACOMBE.)

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Ilfracombe, port of Barnstaple.
- II. Harbour Act.
- III. Wm. Rodgman, Harbour Master.
- IV. One light.
- V. I suppose in the year 1730, from the date of the Harbour Act.
- VI. By the ancestors of Sir Bouchier Wing, Baronet, the present lord of the manor of Ilfracombe.
- VII. Lighthouse built on the extremity of the rock at the entrance of the harbour, being the best position as a guide for entering the harbour.
- VIII. Not known.
- IX. Do not know.
- X. Harbour light.
- XI. Whitewashed cottage.
- XII. None.
- XIII. Thirty feet.
- XIV. About 100 feet.
- XV. About 20 miles.
- XVI. About 12 miles.
- XVII. Do not know.
- XVIII. Fixed red light.
- XX. From 1st September to 31st March; sunset to sunrise every year.
- XXI. 3 12-in. silvered reflectors.
- XXII. Three burners.
- XXIII. None.
- XXV. Two chimneys in the roof of the lantern.
- XXVI. None.
- XXIX. The lighthouse, &c. were erected nearly 200 years since and there are no documents extant to show the cost of construction.
- XXXI. Lantern 8 feet high and 20 feet in circumference.
- XXXV. Light keeper, 3*l.* 3*s.* per year, with coals and house free.
- XXXVIII. None used.
- XXXIX. Gas.
- XLI. No fog signals.
- XLII. Vessels belonging to the port 6*d.* each time coming in; strangers 1*s.* ditto. Payable, harbour fund, "when lighted."
- XLIII. Average 20*l.* a year.
- XLIV. Average 18*l.* a year.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. Under the inspection of the harbour master and a jury of 12 men.
- LI. December 1858.
- LII. No.
- LV. Not deemed necessary.
- LVIII. Under the inspection of the harbour master.

BUOYS AND BEACONS.

- I. William Rodgman, Harbour Master, Ilfracombe.
- II. Two warping buoys "only" at the entrance of the harbour.

LLOYD'S EVIDENCE.

- I. William Huxtable, Ilfracombe, agent for Lloyd's.
- II. ILFRACOMBE District for Lloyd's, MART POINT TO HURLESTONE POINT, including LUNDY ISLAND.
- III. Sir Bouchier Palk Wrey, Bart., lord of the manor of Ilfracombe, who is also trustee for the harbour, has the control of the harbour lights. The Trinity lights on Lundy Island; I have never heard any complaint. The revolving one shows magnificent; can be seen from this place distant 21 miles.
- IV. I should recommend a buoy to be placed near the Copperas Rock, lying half a mile off the shore under the high Hangman Hill. The Sandridge buoy, abreast of Lynmouth, was changed about four months ago by the tender from the Trinity depot at Cardiff.
- V. I consider that the buoy at Mart Point, with staff and globe, should be replaced by a bell buoy, several vessels having run against the present one. The tide runs so strong at the Point and Stone, that deeply laden vessels are obliged to give it a wide berth in bad weather.
- VI. Buoy near the Copperas rock, there is but six feet on it at low-water springs, but with a leading wind conifers go between it and the main.
- VII. Harbour light, gas.
- VIII. Nothing has occurred to my knowledge.
- IX. I have always informed the parties at the Trinity sta-

II.

WING, Sir B. P., and WISBECH.

WING.
Circular VI.

tion, Milford, when anything has occurred to the Morte Stone buoy as to its being damaged. Several vessels have been known to run against, by the globe having been knocked off and it being staved, so that it daily went deeper and last disappeared.

- X. I do not know of any complaints having been made to any parties. Had there been a buoy on the Copperas rock the "Dolphin" of this port would not have struck in a clear day; she was laden with copper tiles from Llanelly, for Gloucester; she paid off and sunk in deep water. The divers could never find any of the cargo. The "Betsey" smack, of Dideford, struck it, and put into this port in a sinking state. Three months ago Mr. John Dover and Captain Ley, of Combmartin, were fishing over this rock; they saw a schooner steering for it, they hailed to alter her course, which was not heeded, and she struck; being flood she floated off and proceeded up channel. No tide signals are used, as we are on this side of the channel; at a quarter of a mile from the entrance of the harbour there is six or seven fathoms water.
- XII. The only fog signal used at present is by the man at the lighthouse, who blows his horn, which is over the entrance of the harbour.
- XIII. There are two warping buoys at the entrance, and buoys in the inner harbour for mooring, which are the private property of the harbour trustee.
- XIV. The warping and mooring buoys are black.
- XV. The harbour lights are collected by the water vessel. A vessel belonging to the port pays 6*d.*, not belonging 1*s.*—(the buoys)—vessels belonging to the port 1*s.*, not belonging, warping buoy, 1*s.*, and to the mooring buoys, 2*s.*
- XVI. I know of no complaint having been made, as I consider that would be fruitless, although there is a clause in the Harbour Act that all persons shall have free access at all seasonable times without fee or reward, to inspect the accounts, which has never been done, and only seen by Sir Bouchier Wing and his steward on the rent day.
- XVII. I have never heard the mariners complain of the harbour light.
- XVIII. The charges are small, but quite adequate for the accommodation rendered to those vessels that put in.
- XIX. The only persons who can answer this query must be Sir B. P. Wing, his steward, and water bailiff.
- XX. None.

82. WISBECH.

WISBECH.
Circular III.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Port of Wisbech.
- There is no lighthouse established within the port of Wisbech.
- Note.—A full abstract of the accounts was sent with this return and preserved with the original papers.
- There are two small light towers erected at the lower termination of the Nene Outfall Cut, one on each side the channel, but they have never been used, nor are they considered at all necessary, as the system of lighting adopted in this port is found to answer all purposes required.

BUOYS AND BEACONS.

Circular V.

- I. The Mayor, Aldermen, and Burgesses of the borough of Wisbech.
- II. The Corporation are not in possession of a chart of this description.
- III. It is not so responsible.
- IV. No other authority is so responsible.
- V. The buoys are not classified and designated.
- VI. The Outer Roaring Middle Buoy under the jurisdiction of this authority has lately been changed from a can buoy, moored by its smaller end, to a larger buoy of the same shape, out moored and ballasted at the broad end, so as to stand upright when afloat, and carrying a spherical beacon on a staff at the smaller end. This is in an exposed situation, and is understood to be much approved. The other buoys used are a nun buoy, and several can buoys moored by the smaller end. They are all quite sufficient for the purpose, and no complaint has ever been made respecting them, and they are therefore considered to be generally approved.
- VII. The buoys are changed once in every year, in the month of June, and the duplicate or reserve buoys as soon as they are taken up, or recovered after

WISBECH.
Circular V.

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any casual displacement, are thoroughly overhauled, repaired, and painted, or dressed with tar (as may be required).

VIII. Every buoy is examined as soon as it is brought in, and if repairs are necessary they are done immediately, if unfit for service it is not used, but the buoys are found with careful treatment to last many years, and few cases of buoys being condemned as unserviceable have occurred for some years past.

IX. The Beacons are not classified.

- X.
- a. Eight beacons on the Stones, west side of river.
 - b. About 1830.
 - c. To show the sides of the river when covered with water.
 - d. Thorn bush on tops of beacons.
 - e. Ash pole.
 - f. Natural colour of materials.
 - g. Not lighted.
 - h. Four feet.
 - i. 1s. 3d. each beacon.
 - j. 1852, not known, estimated at 20s. 1858, about 20s.
 - k. None.
 - a. Eight beacons on the Stones, east side of river.
 - b. 1830.
 - c. To show the sides of the river when covered with water.
 - d. Bunch of straw on tops of beacons.
 - e. Ash pole.
 - f. Natural colour of materials.
 - g. Not lighted.
 - h. Four feet.
 - i. 1s. 3d. each beacon.
 - j. 1852, not known, estimated at 20s. 1858, about 20s.
 - k. None.
 - a. Large beacons at Stone Ends.
 - b. June 28th 1858.
 - c. To show the position of the stone ends in dawn of morning or dusk of evening, when smaller beacons at sides would not be so clearly visible.
 - d. Slatted oval ball.
 - e. Large fir-pole with wooden slatted ball.
 - f. Black.
 - g. Not lighted.
 - h. Twenty feet.
 - i. 2l. 10s.
 - j. 1852, not then erected. 1858, it has cost nothing since first erected.
 - k. None.
 - a. Bank End, Middle Beacon.
 - b. About 1830.
 - c. To show the channel.
 - d. Basket on top of beacon.
 - e. Ash pole.
 - f. Natural colour.
 - g. Not lighted.
 - h. Six feet.
 - i. 5s.
 - j. 1852, not known, estimated at 5s. 1858, about 5s.
 - k. None.
 - a. Two beacons on the West Mark Knock.
 - b. About 1830.
 - c. To show the channel along the edge of the West Mark Knock Sand.
 - d. Basket on top of beacon.
 - e. Ash pole.
 - f. Natural colour.
 - g. Not lighted.
 - h. Ten feet and 15 feet.
 - i. 5s. each.
 - j. 1852, not known, estimated at 5s. 1858, about 5s.
 - k. None.
 - a. The West Mark Knock Beacon.
 - b. Renewed in 1852 (old one many years before).
 - c. To show the position of the sands.
 - d. Oval slatted ball at top.
 - e. Fir pole set in ludgett, secured by chains, braces, and cleats nailed on the pole; wooden slatted ball at top.
 - f. Black.

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- g. Not lighted.
- h. Twenty feet.
- i. 55l.
- j. 1852, nothing. 1858, nothing (now wants new chain braces.)
- k. None.
- a. The Mussel Scalp Beacon.
 - b. 1857.
 - c. To show the channel.
 - d. Thorn bush at top.
 - e. Ash pole.
 - f. Natural colour.
 - g. Not lighted.
 - h. Eight feet.
 - i. 5s.
 - j. 1852, estimated at 5s. 1858, about 5s.
 - k. None.
- a. Two beacons between Stone Ends and Floodway.
 - b. About 1830.
 - c. To show the channel.
 - d. Thorn bush at top.
 - e. Ash pole.
 - f. Natural colour.
 - g. Not lighted.
 - h. Ten feet.
 - i. 5s. each.
 - j. 1852, estimated at 5s. each. 1858, about 5s. each.
 - k. None.
- a. The Floodway Beacon.
 - b. 1853.
 - c. To show the channel.
 - d. Thorn bush at top, and lantern in white.
 - e. Fir pole.
 - f. Natural colour.
 - g. Lighted with oil lamp during dark tides in winter.
 - h. Ten feet.
 - i. Pole 3s.; lantern 30s.
 - j. 1852, estimated at 2l. 6s. 6d. 1853, about 2l. 6s. 6d.
 - k. None.
- a. Four beacons on west side of Floodway.
 - b. 1853.
 - c. To show the channel.
 - d. Thorn bush at top.
 - e. Ash pole.
 - f. Natural colour.
 - g. Not lighted.
 - h. Four feet.
 - i. 5s. each.
 - j. 1852, estimated at 5s. each. 1858, about 5s. each.
 - k. None.
- a. Two beacons on east side of Floodway.
 - b. 1853.
 - c. To show the channel.
 - d. Basket at top.
 - e. Ash pole.
 - f. Natural colour.
 - g. Not lighted.
 - h. Four feet.
 - i. 7s. 6d. each.
 - j. 1852, estimated at 7s. 6d. each. 1858, about 7s. 6d. each.
 - k. None.
- a. The Life Beacon.
 - b. 1809.
 - c. To show the channel.
 - d. Thorn bush at top, and lantern in winter.
 - e. Fir pole.
 - f. Natural colour.
 - g. Lighted with candle during dark tides in winter.
 - h. Eight feet.
 - i. Pole 3s. 6d.; lantern 30s.
 - j. 1852, estimated at 2l. 8s. 9d. 1852, about 2l. 8s. 9d.
 - k. None.
- a. Bachelor's Bay Beacon.
 - b. Not known, from time immemorial.
 - c. To show the side of the roads called the Eye.
 - d. Thorn bush at top.
 - e. Fir pole.
 - f. Natural colour.
 - g. Not lighted.

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- h. Nine feet.
i. 10s.
j. 1852, estimated at 10s. 1858, nothing.
k. None.

The following beacons are used only for carrying lights during the dark tides in winter.

- a. Four between the lighthouses and the Stone Ends.
b. About 1830.
c. To direct ships along the river from the lighthouses to the Stone Ends at night.
d. By their position.
e. Fir pole with lantern.
f. Glass in lanterns colourless.
g. Oil lamp.
h. Eight feet.
i. Poles 4s. each; lanterns 30s. each.
j. 1852, estimated at 2*l.* 5*s.* 6*d.* each. 1858, about 2*l.* 5*s.* 6*d.* each.
k. None.

- a. Two at the Stone Ends.
b. 1830.
c. To direct ships from the Floodway Beacon to the Stone Ends at night.
d. By their position.
e. Fir pole with lantern.
f. Glass in lantern colourless.
g. Oil lamp.
h. Six feet.
i. Poles 4s. each; lanterns 30s. each.
j. 1852, estimated at 2*l.* 5*s.* 6*d.* each. 1858, about 2*l.* 5*s.* 6*d.* each.
k. None.

- a. Two on the Life Beacon Sand (besides the Life Beacon itself), and two in Slush Hole.
b. 1830.
c. To direct ships along the Floodway at night.
d. By their position.
e. Fir pole with lantern.
f. Glass in lantern colourless.
g. Single candle in lantern.
h. Eight feet.
i. Poles 4s. each; lanterns 30s. each.
j. 1852, estimated at 2*l.* 1*s.* each. 1858, about 2*l.* 1*s.* each.
k. None.

XI. No alteration in the nature of the buoys and beacons has been made, except as above stated (No. VI.) with respect to the Roaring Middle buoy. Two buoys of that kind were made for that station, one to be kept in reserve.

XII. The only general principle or uniform system adopted in the buoying of this port is that of placing black buoys to the eastward, and red buoys to the westward of the channel, and of placing all the buoys in the best possible positions under the circumstances, these positions being subject to alterations from time to time on account of the shifting of the sands, by which the channel is sometimes considerably diverted.

XIII. The general principle which governs the placing of the beacons is to have a large bush on the top of the beacons on the west side, and a large basket on those on the east side of the channel, the positions being changed from time to time as the alterations in the sands required.

XIV. The buoys are maintained by the harbour tolls and duties, which are payable into the office of the collector appointed by this authority, and are paid by such collector to the treasurer of this borough. See the copy of his account for last year sent herewith, as to the application of the harbour tolls and duties.

XV. The same as No. XIV.

XVI. Total income, Midsummer quarter, 1852, 887*l.* 12*s.* 8*d.* Ditto, Midsummer quarter, 1858, 674*l.* 3*s.* 4½*d.* Total income for 1852, 3,610*l.* 19*s.* 8*d.* Total expenditure in 1852, for buoys and beacons, 172*l.* 4*s.* 1*d.* Ditto in 1858, 94*l.* 15*s.* 11*d.* The income is chargeable with various other payments, besides those for maintaining buoys and beacons; amongst other things with the interest of 49,000*l.* on mortgage. See the treasurer's account to September 1859 sent herewith.

XVII. On the 19th June 1856, Mr. Daniel Sydal, of Lynn, wrote to inform the harbour master of Wisbech that a Boston barge had been sunk below the bar buoy, and inquiring if he intended placing a buoy

WISBECH AND WORKINGTON.

on the wreck, as it was said to be needful. On the 25th July 1856, the mayor was authorized to direct the harbour master to place a buoy upon the wreck, if, upon further enquiry, it should be found necessary. The mayor found it necessary, and a buoy was forthwith afterwards put down and was continued there until the wreck disappeared.

XVIII. No such application has been made.

XIX. By the harbour master on the following dates, viz., in June 1857, and June 1858, and at various times during those years.

XX. By the same person on the same dates.

XXI. If a buoy is known to be off its station another is immediately laid, and no notice is therefore necessary. Such changes as have been heretofore made have been previously advertised in the "Shipping Gazette," and local papers, except those which the gradual alteration of the channel has rendered necessary, and in these cases the changes are not so considerable or so abrupt as to render advertisement necessary.

XXII. Yes.

XXIII. The Harbour master, who resides near the outfall of the river (and who is also headsmen of the pilots, who report to him), immediately writes to the town clerk, and he, if necessary, calls the Port and Harbour Committee, or the Council together.

XXIV. On the 28th July 1855, the Trinity House of Deptford Strond represented that the Outer Roaring Middle Buoy was not of sufficient magnitude, and that the Bar Buoy was not readily readily distinguishable from that abreast of it on the upper part of the Roaring Middle, and might be advantageously painted of a different colour. The subject was immediately taken into consideration, and the suggestions being approved were carried into effect as soon as practicable. (See Replies Nos. VI., XI., and XXV.)

XXV. The only case of this kind is, that of the Outer Roaring Middle Buoy mentioned in the above reply, No. VI. It is understood from inquiry amongst masters of vessels, that the change in that case was a very good one.

XXVI. There are no general rules or regulations issued by this authority for the purpose mentioned. There are no printed forms kept relating to the buoys or beacons.

XXVII. The buoys and beacons are occasionally inspected by the members of the council, but the harbour master is charged with the immediate supervision of them, and the pilots are instructed to report to him immediately if anything is wrong, or required to be done, and they invariably do so.

83. WORKINGTON.

LIGHTHOUSE.—(SPECIAL RETURN.)

1. Harbour Master, Workington, Cumberland.

Herewith is a plan of Workington harbour.

We have but two gas lights for the use of vessels coming into and going out of the harbour; they are lighted when there is 8 feet water in the harbour, and put out when the tide retires to that height. They are under the entire control of the Trustees of the harbour, and belong to them. They are used solely for harbour or local purposes; no revenue is received from them, and no account kept of the expense of lighting, &c. The larger one is erected on John's Pier, the other on old pier further up, and both within the limits of the harbour, which is a dry one.

In addition to the above, there are two other small gas lights on the New Quay (see plan of harbour), which are lighted and put out at the same time as the other two lights mentioned above.

JAMES THOMPSON.

BUOYS AND BEACONS.

I. Harbour Master, Workington, Cumberland.

Enclosed is a copy of plan of the harbour.

We have no buoys or beacons, but those laid down for the guidance of vessels coming into and going out of the harbour, which is a dry one. The buoys are the property of the Trustees of the harbour, who order them to be placed in the most advantageous positions; no account is kept of the cost or the annual expense incurred. The lowest buoy at the entrance to channel is an iron one, and always afloat the others are wood, and aground when the tide is out.

JAMES THOMPSON.

WISBECH.

Circular V.

WORKINGTON.

Circular III.

Circular V.

SCOTLAND.

1. ABERDEEN.

The Commissioners visited Aberdeen on the 26th of July, from the "Vivid," and examined sundry witnesses.

1. The manager of the London and Aberdeen Steam Company stated that he had been manager for eight years; he had never heard a complaint of the lights, and had never known anything to be wrong with them during that time.

2. Mr. Rose, a large shipowner, had never heard any complaint.

The officer of the Harbour Commissioners was visited. The returns called for on the 13th of April had not been begun, and they were never sent, though several letters were written on the subject.

The Harbour Commissioners consist of 12 members, elected annually by householders and shipowners, and of 19 members who compose the town council and are *ex officio* Harbour Commissioners. There are two leading lights under their control; they are red when the harbour can be entered with safety; green, when it is dangerous. Formerly, the lights were extinguished when the harbour was dangerous. Both these arrangements were sanctioned by the Commissioners for Northern Lighthouses, and the Harbour Commissioners do not consider themselves responsible. It was stated that the former arrangement was much complained of, and the latter is approved, by those most interested; but there does not seem to be any good reason for indicating safety by red contrary to the usual practice, which is to mark danger by red. Mr. Reid, the treasurer, had not heard any complaints of any lights.

These lights, Nos. 65 and 66 on the list of lights visited or seen alight, were visited on the 26th of July. They are of iron, with one light and reflector in each. The colour is produced by glass screens, placed in front of the reflectors. The signal for changing the colour is given from the end of the pier by showing a light.

No boxes are provided for keeping the cleaning materials separate, all are consequently stowed away together in small wooden presses.

The light-keeper is paralytic, and his son looks after the lights. He was never taught to clean reflectors, and had never been to Girdleness (distant about a mile) to see how they are cleaned there. He was formerly a carpenter. The reflectors under his charge, the lantern, and the house generally, were in a condition far inferior to establishments under the Commissioners for Northern Lights, for example, the nearest, Girdleness.

On the 21st of September, in the evening, Dr. Gladstone visited the lighthouse at Girdleness, which is under the charge of the Commissioners for Northern Lights, and found everything in excellent condition. He afterwards visited the harbour lights, and found the one which he ascended in very bad condition. The lamp was burning with a low flame and charred wick; the reflector was not well polished, and the red glass was dusty. The observations formerly made by other members of the Commission were confirmed.

2. ARDROSSAN.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Ardrossan Harbour Light, Ardrossan.
 II. The Earl of Eglinton and Winton, owner of the harbour, Eglinton Castle, Irvine.
 III. John Moffat, C.E., Ardrossan.
 IV. There is only one light.
 V. No application was ever made.
 VII. Because it is at the end of the outer pier, and can show the fairway channel into the harbour.

ARDROSSAN.

VIII. It was first shown in present position on 1st November, 1856.

IX. John Moffat. It was not built by contract.

X. Harbour light.

XI. Stone, solid for 11 feet, thence to top a hollow cone, painted white.

XII. Not fitted with conductor.

XIII. Twenty-three and a half feet.

XIV. Twenty-five feet.

XV. Six miles at high water.

XVI. Eleven miles at high water.

XVII. Twenty degrees. The centre bearing is E. by N., and the extremes are E. by 14° N. and E. by 214° N.

XVIII. A fixed red light.

XX. From sunset to sunrise.

XXI. Stevenson's heliophotal apparatus, which is both reflecting and refracting.

XXII. One gas Argand of 20 holes.

XXIII. On 1st November 1856 the present light was exhibited, in place of two fixed harbour lights that previously existed.

XXIV. James Milne, Edinburgh.

XXV. Air is admitted at the door, and escapes by holes in the roof.

XXVI. None are used.

XXVIII. No register kept; fogs are almost unknown and never interrupt the navigation.

XXIX. 160*l*.

XXXI. The lantern is circular, and 31½ inches in diameter. The cost was 30*l*.

XXXIII. 5*l*. is the annual average, and all repairs are done by the harbour workmen.

XXXIV. It is painted once a year by harbour workmen, at a cost of 3*l*.

XXXV. There is one keeper, who gets 36*l*. 8*s*. a year.

XXXVI. Price of apparatus 14*l*. 11*s*. 6*d*.; cost of fitting 10*l*. 15*s*., and of transport 1*l*. 10*s*.

XXXVII. 4*l*.

XXXVIII. 36,600 feet of gas.

XXXIX. Gas at 5*s*. 6*d*. per 1,000 feet.

XL. 9*l*. 18*s*. is the annual cost of the gas.

XLI. From harbour revenue.

XLII. There are no light dues.

XLIV. 58*l*. 6*s*.

XLV. None made.

XLVI. None made.

XLVII. None made.

XLVIII. None made.

XLIX. None made.

L. By Mr. Moffat, Engineer to the harbour.

LI. Every month.

LII. Once, on 9th December 1856, by the lantern having been broken: when it was extinguished part of one night.

LIV. None.

LV. None are used.

LVI. None are used, because not found necessary.

LVII. The keeper has only to light the gas at night and extinguish it in the morning. The pilots on watch during night report any accident to the light.

LVIII. The keeper must keep light exhibited from sunset to sunrise, and have the whole apparatus always clean and efficient.

BUOYS AND BEACONS.

I. The Earl of Eglinton and Winton, Eglinton Castle, Irvine.

II. Admiralty chart sent herewith, with beacons and buoys marked thereon. The annual cost of maintenance is 25*l*.

III. It is not.

IV. There are none.

V. a. 1*s* of wood and iron.

b. 7*l*. 10*s*.

c. 10*s*. per annum.

d. 3*s*. 6*d*. per annum.

e. Four.

f. Five.

g. Harbour store.

h. There are three with spare moorings.

i. None.

k. By a mooring anchor and chain, or by an iron bolt fixed in bottom with chain.

l. 75*l*.

ARDROSSAN.

Circular III.

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ARDROSSAN and AYR.

- m. They are obtained by open tender, and kept in repair by the workmen employed by harbour.
- n. Colour only.
- o. Four.

VII. Six months.

VIII. They are examined every month.

IX. They are not classified.

- X. a. One on Horse Island, called Horse Island Beacon, built of stone; and a second on the Crinan Rock, called the Crinan Beacon, built of timber.
 - b. The first in 1816, and the second in 1845.
 - c. To show position of harbour and of entrance.
 - d. The form and height.
 - e. Stone and timber.
 - f. Horse Island, white and black. Crinan Beacon, black.
 - g. Not lighted.
 - h. Horse Island Beacon, 55 feet above H. W., Crinan Rock Beacon, 11 feet above H. W.
 - i. Horse Island Beacon, cost 320*l.* Crinan Rock Beacon, cost 25*l.*
 - k. None.
 - j. 20*l.*

XI. The original forms of the buoys are retained; but the colours were recently altered from being all red to be black on port side, and red on starboard, while entering harbour.

XII. Some of the buoys are on sunken rocks, and the others are for warping vessels out and into the harbour.

XIII. They are fixed to show position of Horse Island and of the Crinan Rock.

XIV. From the harbour dues, which are collected in harbour office.

XV. From the harbour dues, which are collected in harbour office.

XVI. No income; expenditure 25*l.* per annum.

XVII. None.

XVIII. None.

XIX. By harbour master every month.

XX. By harbour master every month.

XXI. The harbour master.

XXII. Lord Eglinton or his commissioner is written to.

XXIII. No complaint has ever been made.

XXIV. None.

XXV. There are no general rules, except an order to the harbour master to inspect them every month, and see that they are all right.

3. AYR.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Ayr.
- II. The trustees of Ayr Harbour.
- III. Thomas McCosh, Secretary to Ayr Harbour Trustees.
- IV. Three lights, two in a round tower or lighthouse on the north side of the harbour, the lower red and the upper white; and a half-tide red light in a small iron lighthouse on the north wall, 850 feet N. W. by W. $\frac{3}{4}$ W.
- V. December 1789.
- VI. Emanated from the Harbour Trustees.
- VII. Being the most suitable for the guidance of vessels in taking the bar. When the three lights are kept in a line they lead over the bar in the deepest water.
- VIII. 1790.
- IX. John McSkimming, builder; Robert Paton, engineer. Built by contract.
- X. Harbour lights.
- XI. Stone and lime, with a malleable iron dome or top, all painted white.
- XII. Not fitted with lightning conductor.
- XIII. Sixty-one feet.
- XIV. Upper light, 56 $\frac{1}{2}$ feet; lower, 37 $\frac{1}{2}$ feet; half-tide, 14 feet.
- XV. About 15 miles.
- XVI. Upper bright light, about 10 miles; lower red light, about 7 miles; and half-tide red light, about 4 miles.
- XVII. One hundred and fifty degrees S.W. to N. by E.
- XVIII. Fixed. For colours see answers No. IV.
- XIX. No revolution.
- XX. From sunset till sunrise.
- XXI. Dioptric.
- XXII. One burner.
- XXIII. None.
- XXIV. Francois Soleil.

AYR.

- XXV. By a pipe and openings in the roof.
- XXVI. None.
- XXVII. None.
- XXVIII. None.
- XXIX. 44*l.* 12*s.*, including 4*l.* for iron top.
- XXX. Finished.
- XXXI. No lantern; ventilating apparatus and fitting about 3*l.*
- XXXII. Not purchased.
- XXXIII. 1*l.* per annum; not by contract.
- XXXIV. 2*l.* per annum; contract; painted when required, not annually.
- XXXV. One keeper at 20*l.* per annum.
- XXXVI. Price of illuminating apparatus, 30*l.* 2*s.*; cost of fitting, 11*l.* 18*s.*; cost of transport, 2*l.*
- XXXVII. 10*s.*
- XXXVIII. Nothing.
- XXXIX. Lighted with gas.
- XL. None.
- XLI. None.
- XLII. From the general revenue of the harbour, no charge being made on vessels for the lights.
- XLIII. No income.
- XLIV. See answers to XXXIII., XXXIV., XXXV., and XXXVII. No other expenditure.
- XLV. No complaints.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. By the harbour master.
- LI. Almost daily.
- LII. Three times by air in the gas pipe, and not more than a few hours at a time. Dates not recorded.
- LIII. None.
- LIV. None.
- LV. During the day a flag is hoisted over the lighthouse when there is 8 feet water over the bar, and continues from half-flood till half-ebb. The half-tide light serves the same purpose during the night.
- LVI. Not considered necessary.
- LVII. One keeper does all the duty.
- LVIII. No written instructions. Lighthouse keeper lives in lighthouse, and always in attendance.

BUOYS AND BEACONS.

- I. The trustees acting under "The Ayr Harbour Act, 1855."
- II. Two buoys, as laid down on chart herewith sent. Cost of maintenance in 1852, 2*l.* 2*s.*; ditto in 1858, 2*l.* 2*s.* No income, no charge being made for buoys.
- III. Not responsible.
- IV. None.
- V. Sketch given on chart as above.

- a. Iron.
- b. 16*l.*
- c. 1*l.* 10*s.*
- d. 12*s.*
- e. Two.
- f. One.
- g. Harbour yard.
- h. One.
- i. One.
- j. Long succession of heavy gales.
- k. By a single fluked anchor.
- l. 10*l.*
- m. By tender.
- n. Both painted red.
- o. Two.

- VI. Not qualified to give on opinion.
- VII. None, but inspected and repaired at least every summer.
- VIII. Inspected quarterly by the harbour master.
- IX. No beacons.
- X. None.
- a—k. See No. IX.
- XI. No beacons. Iron buoys have been substituted for wooden ones.
- XII. Channel so very short, no general principles necessary. The buoys mark shallow water.
- XIII. None.
- XIV. From the general revenue of the harbour, no charge being made for buoys.
- XV. No beacons.
- XVI. No revenue.
- XVII. None.
- XVIII. No application has been made.
- XIX. By the harbour master, quarterly.
- XX. None.
- XXI. Buoys so near when displaced are at once seen, and are immediately replaced.

AYR.
Circular III.

Circular V.

AYR.

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AYR—BANFF—BOAT GREEN—BO'NESS—BUCKIE.

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Circular V.

- XXII. Yes, the harbour master, acting under the authority of the trustees.
 XXIII. Harbour master reports to the harbour trustees.
 XXIV. None.
 XXV. None.
 XXVI. None, not considered necessary.

Circular VI.

LLOYD'S EVIDENCE.

- I. John Gray, Lloyd's agent. Ayr.
 II. AYR.
 III. Trustees of Ayr Harbour.
 IV. All, with the exception of Brest Rocks, to the south of the harbour, and Lady Isle, near Troon.
 V. At present there is a beacon on Brest Rocks; in fogs and dark nights, when it is most wanted, it is of little service, and the consequence is that a number of vessels run on these rocks every year, and the same may be said with respect to Lady Isle.
 VI. For the reasons immediately preceding, I would recommend that a lighthouse be placed on Turnberry Point for Brest Rocks, and another on Lady Isle.
 VII. Gas.
 VIII. I am not aware of any.
 IX. None of the buoys have been off for any length of time, and no accident has occurred in consequence of any of them being off.
 X. Among others, the Elizabeth of Liverpool, in April last, with the wind off shore, ran on Brest Rocks, and sustained a good-deal of damage, and her cargo, bone ash and guano, was all damaged as she filled with water. In September last the barque T. F. Schutt, of Hamburg, ran on shore near Turnberry, and was a total wreck. I think neither of these accidents would have occurred, had there been a light on Turnberry or Brest Rocks.
 XI. At half flood there is a large red flag hoisted on the harbour lighthouse, and keeps flying to half ebb when any vessels are in sight in day-time, and at night the outer leading light is lighted from half flood to half ebb, which appears to answer the purpose.
 XII. There are no fog signals; a bell would be of service. We have not many fogs.—There are only two buoys, both red, and barrel-shaped; the inner placed outside the Nicholas Rock, and the outer on a shoal three-quarters of a mile from the bar; the directions being to keep both buoys on the starboard hand in coming in.
 XIV. None.
 XV. None.
 XVI. At the request of the mariners frequenting the port, the half tide light, in January last, was changed from bright to red.—I am aware of no other complaints having been made.
 XVII. I believe they are considered tolerably efficient.
 XVIII. No dues levied.
 XIX. See No. XVIII.
 XX. Considered satisfactory.—Ayr, 20th December, 1859.
 I concur in the foregoing answers. J. Stewart,
 Collector H. M. Customs, Ayr.

- I. Peter Smith, North Quay. Ayr. ship builder.
 II. AYR.
 III. Ayr Harbour trustees: Thomas McCosh, secretary.
 IV. Very well lighted, with the exception of Turnberry and Lady Isle, which I think should have a light each.
 V. There are at present two buoys outside of the bar, one on the inner and one on the outer Nicholas Rocks, both buoys on the north side of rock, being the side next channel.
 VI. One light on south-west side of Lady Isle; one light on west side of Turnberry.
 VII. Gas.
 VIII. None that I know of.
 IX. They have been several times adrift, owing to the chains wearing by the friction from the buoys, but never above a day or two, until replaced again.
 X. There have been a great many vessels on Brest Rock, and two or three on Turnberry, for want of lights, and also on Lady Isle.
 XI. There is a large red flag hoisted in the day-time, on the inner lighthouse, from half flood to half ebb, and at night there is a red light shown in the outer lighthouse, from half flood to half ebb.
 XII. None used; there are very seldom any fogs here.
 XIII. Coloured red: barrel form, and placed on the north side of the rocks next the channel.
 XIV. No.

- XV. The harbour dues include lights, buoys, and tonnage, and are paid to the harbour trustees.
 XVI. Several complaints were lodged against the light in the outer lighthouse being bright, and it was changed from bright to red last January.
 XVII. Several shipmasters frequenting the port, would like to have the outer light placed on the South Pier, instead of on the north wall.
 XVIII. No complaints that I have heard of.
 XIX. The whole dues are taken for pilotage, buoying, lighting and improving the harbour.
 XX. The general opinion is, that the whole is kept in good repair.—Ayr, 20th December, 1859.

4. BANFF.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Banff.
 II. There is not any lighthouse belonging to or under the management of the Town Council of the Burgh of Banff.

BUOYS AND BEACONS.

- I. The Town Council of the Burgh of Banff.
 II. There are not any buoys or beacons belonging to or under the management of the parties making this return.

5. BOAT GREEN.

BUOYS AND BEACONS.

Gatehouse, May 2, 1859.

THE only replies I can give to the numerous queries are these:—There is neither buoys, beacons, or lights; but the common coasting lights in this insignificant creek of Fleet, which disembogues itself about two miles below the wharf. This small river being very winding, the banks on each side are marked with small upright rods or "perches," set up at all the bends to mark the run of the river, and the vessels pay for keeping them up, according to their tonnage, from 6d. to 1s. 6d.; 1s. 6d. being the highest charge each trip. Vessels over 50 to 60 tons finds great difficulty to get to the wharf, except at high spring tides, the channel being shallow and narrow.

Regarding moorings, they are posts and ring-bolts planted at the wharf for the purpose.

If any more information be required, shall be happy to reply as far as I can.

JAMES McADAM.

6. BORROWSTONNESS.

Borrowstonness, April 5, 1859.

HONOURABLE SIR,

ON the quays at the harbour of Borrowstonness are seven gas lamps, and the one at the point of the east quay is a fixed red light.

We have two red buoys about 70 fathoms from the harbour, showing the entrance to the harbour.

I am, &c.

GEO. HENDERSON,

Clerk to the Borrowstonness Trustees.

J. F. Campbell, Esq.

&c. &c.

7. BUCKIE.

Buckie, 5th May 1860.

The Secretary,

SIR,—I have received your letter of 1st instant, and now beg to enclose the returns upon lighthouse, and buoys and beacons, which I hope you will find satisfactory.

For any further information requisite I would refer you to R. G. Gordon, Esq., Letterfaurie, at 15, Abbotstford Place, Glasgow, and the Fishery Board, Edinburgh.

BUCKIE and BURNT ISLAND.

There is no Town Council here, and the remarks I have made are simply as from a private individual.

I have, &c.

JOHN DAVIDSON, J.P.

Royal Commission Lights, Buoys, &c.,
7, Millbank Street, London.

Remarks. — The lighthouse at our harbour here was erected in the year 1838, and is for the good chiefly of the fishermen, and the beacon is erected about fifty yards from the harbour on a rock, to guide them into the harbour.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Small harbour lighthouse used according to the tides.
- IV. Only one.
- VII. Most eligible spot.
- IX. Iron lighthouse (bought).
- X. Sea and harbour and tide lighthouse.
- XI. Iron, and painted red.
- XII. Not fitted with lightning conductor.
- XIII. About 14 feet.
- XIV. About 28 feet.
- XV. About 8 miles (supposed).
- XVI. Cannot say with any confidence.
- XVIII. Fixed light (natural). Gas.
- XX. Is shown according to the state of the tide, and fixed light.
- XXII. One gas burner.
- XXV. Small ventilator on top.
- XXVI. No fog signals.
- XXVIII. None kept.
- XXX. Finished.
- XXXII. Purchased (1858).
- XXXIII. No repairs.
- XXXV. One keeper, 10s. per week.
- XXXIX. Gas is used.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- LI. No inspection.
- LII. Never accidentally extinguished.
- LIII. Gas.
- LIV. None.
- LV. None used.

BUOYS AND BEACONS.

- I. John Davidson, J.P., Buckie, Banffshire.
- II. One beacon.
- V. No Buoys.
- X.
 - a. No name.
 - b. 1858.
 - c. Channel beacon for harbour.
 - e. Iron.
 - f. Red.
 - g. Not lighted.
 - h. About 8 feet.

8. BURNT ISLAND.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Burnt Island.
- II. The magistrates and town council of Burnt Island.
- III. Local authority, magistrates and council.
- IV. One light only.
- V. Not known.
- VI. Supposed by Fife Ferry trustees, some time ago abolished.
- VII. For protecting vessels entering the harbour.
- VIII. Not known.
- IX. Not known.
- X. Harbour light.
- XI. Wood house; tin plate roof. N.B.—A new one is about being contracted for being erected on the outer pier presently erecting.
- XII. Two reflectors.
- XIII. Four feet.
- XIV. Thirteen feet above ordinary spring tides.
- XV. About five miles.
- XVI. Is seen at present about six miles distant.
- XVII. South by west to south-west by south.
- XVIII. Fixed.

BURNT ISLAND and CALEDONIAN CANAL.

- XX. From sunset to sunrise.
- XXI. Catoptric.
- XXII. Two burners.
- XXIV. Messrs. Hay, Edinburgh, maker of reflector.
- XXV. Funnel on the top of house.
- XXVI. None.
- XXVII. None.
- XXVIII. None.
- XXIX. Not known. Built or erected on property belonging to the burgh.
- XXX. Probable expense of new lighthouse not yet contracted for.
- XXXII. Purchased from Ferry trustees, at a cost of 5*l.*, then almost in ruins in the year 1845.
- XXXIII. Five shillings.
- XXXIV. Five shillings.
- XXXV. 3*l.* 18s.
- XXXVI. None.
- XXXVII. None.
- XXXIX. Gas used.
- XLII. One farthing per register ton on shipping is charged to maintain lighthouse and light. Payable to magistrates and council at the harbour office.
- XLIII. Yearly income, 1852, 16*l.* 16s.; 1858, 24*l.* 6s.
- XLIV. Yearly expenditure, 1852, 17*l.* 1s.; 1858, 21*l.* 2s.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- LII. It has never been accidentally or otherwise extinguished during this period.
- LIII. No spare lamp or burner; either can be procured on very short notice.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. Being a fixed light, and burning from sunset to sunrise, does not require to be relieved.
- LVIII. No particular rules or regulations.

BUOYS AND BEACONS.

This return does not refer to Burnt Island harbour, there being no buoys outside, only a beacon on West New break-water.

9. CALEDONIAN CANAL COMPANY.

Caledonian Canal Office,

Inverness, May 6th 1860.

SIR, I HAVE the honour to acknowledge the receipt of your further letter of the 1st instant, addressed to the Caledonian Canal Commissioners, and retransmitting printed queries relating to lights, buoys, and beacons, which you desire to have filled up with the appropriate replies, and returned to you. On the part of the Commissioners I should be happy to comply with this desire if it were in my power, but referring you to my communications of 3d and 31st January, I formerly explained that I had found it utterly impracticable to give categorical answers to those queries, or indeed to any of them, inasmuch as they are totally inapplicable to the particular class of lights, buoys, &c., which are under their jurisdiction, and which are so exclusively subordinate and subsidiary to the special purposes of this canal that it could never have been intended that they should fall within the scope of the inquiries of the Commission you represent, otherwise the queries would have been differently drawn out. Be this as it may, I have already furnished you in the communications above referred to, with the fullest and most minute information which it is in my power to give respecting the lights, buoys, &c. connected with the service of the Caledonian Canal, and I cannot even imagine what further is wanted, but will be glad to reply to any inquiry on any special matter of detail which may be pointed out to me, if at all applicable to our case.

I have, &c.

GEORGE MAY,

Engineer and Superintendent of
Caledonian Canal.

J. F. Campbell, Esq.,
Sec. Royal Commission
Lights, Buoys, and Beacons,
London.

CALEDONIAN CANAL.

It appears from this letter that the Caledonian Canal Commissioners have no lights, buoys, or beacons under their control for which returns can be furnished, but it appears from the printed papers sent, that there are lights connected with the canal, and that more are required, for example at Corpach,—that there are buoys which have become waterlogged, and beacons along the course of the canal.

Vessels passing through the canal pay rates, but the returns furnished do not give information as to the application of the funds to lights, buoys, and beacons.

Extracts from Regulations, &c.

All vessels tracked or towed along the canal shall, when meeting or passed by other vessels that are not so tracked or towed, keep as near as possible to the towing-path side of the canal.

All sailing vessels proceeding with a fair wind along the canal, and meeting in opposite directions any steam vessel, shall, as soon as they come within one hundred yards of such steam vessel, haul in their booms and keep to the right or starboard side; but when overtaken by such steam vessel, shall keep to the left or larboard side, so as to pass one another with ease and safety.

Vessels which are waiting their turn, or otherwise, are not to come too close or crowd the approach to any lock, but must be moored astern of each other on the off-side of the canal, so as to allow other vessels to pass out or in conveniently.

When the wind is anywise fresh, vessels to take in all sail at some distance before approaching any lock, and begin to bring up at the first checking posts they come to on the canal banks.

All guide-posts, buoys or beacons on the north-west side of the navigable channel, through the canal, are painted red. Those on the south-east side thereof are painted black.

Generally, in those parts of the lakes where there are no guide-posts, buoys, or beacons there is deep water from side to side; and vessels may give or take a wide berth.

In proceeding eastwards, through Loch-Ness, vessels, on approaching the east end, should keep to the northward until close upon the light, and then enter the channel to the south of the light. In proceeding down through Loch-Dochfour, after passing the Narrows, keep well in the middle, and not too near the banked trackpath, particularly opposite to Dochfour Garden and House, where it is shoal on the north side.

In proceeding westwards through Loch-Ness and Loch-Lochy, vessels, on approaching the west end of each lake, should keep rather to the southward until close upon the lights at Fort Augustus and Gairloch, and then enter the channel to the north of those lights.

LLOYD'S EVIDENCE.

- I. James Davidson, Civil Engineer, residing at Bumfoot Cottage, near Inverness; an officer of the Caledonian Canal Commissioners; receiver of their dues, tonnages, rates, &c., has daily to do with all the coasting and foreign trade passing by the canal. Also agent for "Lloyd's," in Inverness District.
- II. The PORT of INVERNESS, the Caledonian Canal entrance, and approaches thereto, by the Moray Frith, the Inverness and Beaulieu basins.
- III. The Commissioners of Northern Lights, Edinburgh, up to Kessock roads, thence to canal entrance in Beaulieu basin the Caledonian Canal Commissioners, by their resident agents.
- IV. I consider that the port and the adjacent coasts are well lighted, buoyed, and beacons, the buoys in the Frith have been coloured according to late regulations, viz. on approaching the port, red on starboard, black on port hand.
- V. I do not see that any further improvement is called for, either as to buoys, beacons, or light-houses. I consider them well arranged, and carefully looked to by the agents of Lights Commission.
- VI. Is answered by No. V.
- VII. Oil.
- VIII. I have never heard or known of any such case, during 10 years I have been here, nor consequently any accident thereby. The soldiers or garrison at Fort George sometimes light a large fire on Fort Point, and I know an instance of a brig, about 4 years ago, on a dark thick night very nearly led into a serious error thereby, taking it for the

CALEDONIAN CANAL AND CLYDE.

Clanony Point light. Also a case of a stranger vessel, whose chart had the fixed light on the fort or southern point, instead of the Clanony or northern point, but discovered the error in time to save his vessel.

IX. The Canal Commissioners' buoys in Beaulieu basin sometimes displaced by ice and fishermen—but no accident has arisen, and are speedily replaced.

X. I do not know of any.

XI. There are no tide signals. I do not think they are required; deep water always, through the narrows, and once inside Fort George, a safe, quiet anchorage.

XII. I do not think they are required, partly same reason as answer to No. X., and besides the number of shipping frequenting port is so small.

XIII. The buoys are conical, are all systematically arranged and coloured up Frith to canal, as may be seen by reference to admiralty charts, surveyed by Capt. Otter and Slater,—only changed in colour as before stated, viz., now black on port, and red on starboard.

XIV. I think the present colour and arrangement quite satisfactory.

XV. There are no local dues levied for lights, buoys, or beacons.

XVI. I have never heard of any complaints made or even entertained.

XVII. That they all perfectly satisfied as to their efficient state.

XVIII. I have said, there are no local dues, those charged and paid at Custom house are considered very moderate.

XIX. No local dues.

XX. So far as Commissioners of Northern Lights are concerned, efficient, also C. Canal Buoys.—January, 7th 1860.

10. CLYDE.

LIGHTHOUSES.—(GENERAL RETURN.)

- I. Parliamentary Trustees of the River Clyde and Harbour of Glasgow.
- II. Leading lights.—two gaslights on the Port Glasgow Quay. Channel or river lights:—1. Auchencleck lighthouse. 2. Cardross lighthouse. 3. Garmoyle lighthouse. 4. Dumbuck lighthouse. 5. Donald's Quay lighthouse.
- III. Points most convenient for the channel.
- IV. About twenty feet above high-water springs.
- V. The two gas lights on Port Glasgow Quay, with catoptric, with one burner each. Auchencleck, catoptric, with one burner. Cardross, fixed light, 5th order, dioptric, one burner. Garmoyle, floating light, with common lantern, showing light all round, one burner, no reflector. Dumbuck light, common Argand lamp, without reflector, two burners. Donald's Quay, common Argand lamp, one burner.
- VI. All fixed.
- VIII. Leading light:—There are two gas leading lights placed on the Port Glasgow Quay. The westmost is a red light, and the eastmost is a white light; both fixed. River or channel lights:—Auchencleck, fixed, white. Cardross, fixed, red. Garmoyle, fixed, white. Dumbuck, fixed, white. Donald's Quay, fixed, white.
- IX. See sketch.
- XI. Oil, &c.
- XIII. No code of signals.
- XIV. None.
- XV. No income derived from these lights.
- XIX. Leading lights:—The two gaslights on the Port Glasgow Quay are temporary leading lights for the new Port Glasgow Channel. They are large lanterns placed on long lamp posts, and both are fixed. River lights:—Auchencleck is a white light for the old Port Glasgow Channel, and is a lantern hoisted on a pair of shear poles. Cardross lighthouse is a red light, and consists of a good stone erection. Garmoyle is a floating light or barge, the light being hoisted on a pair of shear poles. Dumbuck is a good stone and brick erection. Donald's Quay is a lantern or light hoisted on shear poles, and shows merely up and down the channel.

CLYDE.

LIGHTHOUSES.—(SPECIAL RETURN.)

- I. See General Return.
- II. The Parliamentary Trustees of the River Clyde and Harbour of Glasgow.
- III. The Parliamentary Trustees of the River Clyde and Harbour of Glasgow.
- IV. Seven lights. Chart shows positions and the distances.
- VII. See General Return.
- IX. All built by the river trustees' own workmen.
- X. See General Return.
- XI. Ditto.
- XII. The two stone lighthouses, Cardross and Dumbuck, only have lightning conductors, consisting of a copper rod. No vanes.
- XIV. Westmost light on Port Glasgow Quay, 30 feet; eastmost light, 21 feet; Auchencleck, 32 feet; Cardross, 22½ feet; Garmoyle (above water line), 31 feet; Dumbuck, 21½ feet; Donald's Quay, 28 feet.
- XVI. With the exception of Donald's Quay light all the others may be seen from a distance of about 4 miles.
- XVII. Gas leading lights on Port Glasgow Quay show up the channel:—Auchencleck light, 74°. Cardross light 232° Garmoyle light (all round) 360°. Dumbuck light, 203°. Donald's Quay merely shows up and down the channel.
- XIX. See General Return.
- XX. Sunset to sunrise.
- XXI. See General Return.
- XXII. Ditto.
- XXIII. Cardross light changed in 1859 from a catoptric to a dioptric light, 5th order.
- XXIV. Messrs. Chance Brothers and Co., Birmingham.
- XXV. Ordinary pipe above with admission of air below.
- XXVI. Gongs and Bells.
- XXXI. Cardross lantern 4 ft. 8 in. wide × 3 feet 9 in. high. Dumbuck lantern, 18 in. diameter.
- XXXIII. For year ending 1854, 84l. 14s. 4d.; 1855, 68l. 16s. 4d.; 1856, 18l. 5s. 4d.; 1857, 42l. 11s. 11d.; and 1858, 19l. 11s. 2d., in all 233l. 19s. 1d. All repairs by trustees' own workmen.
- XXXIV. Included in XXXIII.
- XXXV. Five keepers in all, whose united salaries amount to about 156l. per annum; and one attendant at gas leading lights, Port Glasgow, at 1s. per night.
- XXXVI. Cardross light, about 100l. The other lamps and reflectors from 7l. to 8l. each.
- XXXVII. Seven lights at about 5l. 9s. 6d. each for each year.
- XXXVIII. About 40 gallons of colza oil each, and about 12 yards of wick. (Paraffine oil is now used at Cardross light.)
- XXXIX. Colza oil, 1857, 4s. 9d.; 1858, 4s. 6d; Paraffine oil, 5s. 6d. per gallon.
- XL. Clothwick about 1s. per yard, 1857, 3l.; and 1858, 3l.
- XLI. About 2l
- XLII. See General Return.
- XLIII. None.
- XLIV. (Including salaries) 554l. 1s. 7d.; 1852, 312l. 17s. 8d.; 1858, 241l. 3s. 11d.

- LI. Inspected from time to time, generally monthly.
- LII. No.
- LIII. Three spare lamps are kept at Cardross, and 1 spare set at each of the other lighthouses, always ready for use. Oil stored in cellar.
- LIV. None.
- LV. None.
- LVII. Relief not requisite.

BUOYS AND BEACONS.

- I. The Parliamentary Trustees of the River Clyde and Harbour of Glasgow.
- II. Chart showing position of buoys and beacons furnished herewith. No income derived.
- III. No.
- IV. No.
- V. No particular classification.
 - k. Mitchell's screw moorings and stone blocks.
 - m. Buoys made by Trustees' workmen; chains obtained by tender.
- VI. Pear shaped, with small end downwards.
- VII. No fixed period. Generally painted and overhauled every summer.
- VIII. Examined from time to time.
- IX. No classification.
- X. Shown on chart.
 - a. Shown on chart.
 - b. No record.
 - c. To guide vessels using the river.
 - d. None.

CLYDE and CUMBRAE.

- e. The regular built beacons are of stone; others consist of barrel perches, having a cairn of stones round the base.
- f. Those on the port side coming up are black, and on the starboard red.
- g. None of them lighted.
- h. Height variable; average about 15 feet.
- k. No income.
- XII. Buoys are placed on the margin of shoal water, and indicate the line of the channel.
- XIV. From the river and harbour dues on ships and goods, paid into the hands of the Clyde Trustees.
- XV. Ditto.
- XVI. No income derived.
- XVII. None.
- XX. Inspected from time to time.
- XXII. When buoys are displaced the nearest lightkeeper gives information, the river pilots also give intimation of any displacement, and the accident is remedied with as little delay as possible.
- XXVI. None.

LLOYD'S EVIDENCE.

- I. John Millar, harbour master, Greenock.
- II. GREENOCK and the RIVER CLYDE.
- III. The Cumbray Light Trust.
- V. I consider that the coast is well lighted, but would recommend a floating light at Garvel Point, to guide steamers leaving the port of Greenock at night.
- V. I consider the channel well buoyed, the buoys are painted red on the one side, and black on the other; all the lights under the control of the Cumbray Trust are good, and kept in the highest state of efficiency.
- VI. A floating light at Garvel Point, as a guide for steamers leaving the Port of Greenock.
- VII. Gas for the harbour light at Greenock, and oil for all the other lights.
- VIII. No.
- IX. None.
- X. Not aware of any.
- XI. None; Greenock being a tidal harbour, I do not think they are required.
- XII. At this port we use a large bell, which I consider the best.
- XIII. Black and red.
- XIV. No.
- XV. Cumbray Light Trust.
- XVI. I am not aware of any.
- XVII. That it is well lighted and buoyed.
- XVIII. I am not aware of any complaints.
- XIX. I believe they are used for the improvement of the navigation.
- XX. I am not aware of any.

Greenock, 16th December, 1859.—I concur in the above. Captain John Millar for a considerable time commanded one of the mail steamers between Glasgow and Belfast; his opinion is of importance, being that of a gentleman who is intimately acquainted with the navigation of the Clyde.—T. D. Hunter, Lloyd's Agent for Clyde.

The personal observations of the Commissioners on these Lights, &c. are given under the head of Cumbrae below.

11. CUMBRAE.

CLOCH, TOWARD, and CUMBRAE LIGHTHOUSES.—(GENERAL RETURN.)

- I. The Cumbrae Lighthouse Trustees; Secretary's Office, County Buildings, Glasgow; Superintendent's Office, 16, Robertson Street, Glasgow.
- II. 1st, Cloch Lighthouse; 2d, Toward Lighthouse; and 3d, Cumbrae Lighthouse. See tracing and special returns.
- III. The lighthouses have been placed on the sites deemed most prominent for the guidance of vessels up and down the channel.
- IV. See separate returns for heights of lighthouses. These lights have been found practically useful, and sufficient for the different sites.
- V. Catoptric at Cloch and Cumbrae, and catoptric heliophotal at Toward. Catoptric heliophotal have been estimated for Cloch and Cumbrae. 25-inch reflectors have been estimated for Cloch, and a dioptric light for Cumbrae.
- VI. The Trustees have always selected what was considered the most efficient and improved illuminating apparatus.
- VII. Fixed at Cloch and Cumbrae, and revolving at Toward.

CLYDE.
Circular V.

Circular VI.

CUMBRAE.
Circular II.

CUMBRAE.

CUMBRAE.

CUMBRAE.

CUMBRAE.

Circular II.

- VIII. See answer to No. VI.
 IX. A drawing of a lamp and reflector used at Cloch and Cumbrae, and a separate drawing of the illuminating apparatus used at Toward, sent herewith.
 X. See separate table, next page.
 XI. All the stores are supplied by contract, and the quality checked by the lighthouse keepers.
 XII. There are no fog signals.
 XIII. There are no tide signals.
 XIV. There are none.
 XV. See separate returns.
 XVI. The trustees have consulted masters of steamers navigating the Frith, as well as the Trinity House, as to proposed improvements in lights and signals.
 XVII. There are none.
 XVIII. See separate forms sent herewith.

Circular III.

CLOCH LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Cloch Lighthouse. See tracing sent herewith.
 II. The Cumbrae Lighthouse Trustees or Commissioners. See Act 29 Geo. II, cap. 20.
 III. Secretary, Angus Turner, Town Clerk, Glasgow; Treasurer and Superintendent, George Knight, 16, Robertson Street, Glasgow.
 IV. Nine lamps, placed two feet from focus to focus.
 V. Not now known.
 VI. Presumed to be made by parties navigating the Frith.
 VII. Because it was considered the best for guiding vessels up and down the channel.
 VIII. Supposed to be in 1796.
 IX. Cannot be ascertained correctly at this distant period.
 X. A leading harbour light.
 XI. Freestone; inner and outer walls; limewashed white below balcony, and painted white above.
 XII. There is now a lighting conductor there.
 XIII. Eighty feet.
 XIV. Seventy-five feet.
 XV. This light is not intended, nor is it required, to be seen until a vessel has passed the Cumbrae lighthouse.
 XVI. About 15 or 16 miles.
 XVII. May be seen from all points between east, seaward, to south by west.
 XVIII. Fixed, white.
 XX. From 20 minutes after sunset to sunrise.
 XXI. Catoptric. Catoptric holophotal has been estimated for, and the treasurer intends to recommend their adoption.
 XXII. Nine burners.
 XXIII. None.
 XXIV. Mr. Slight, Leith Walk, Edinburgh.
 XXV. Ventilator in balcony door and top of dome.
 XXVI. None. See correspondence as to signals at the Cumbrae.
 XXVIII. Ten days in 1858.
 XXIX. Cost cannot be ascertained, but there were spent for repairs in 1827, 1828, and 1829, 1,493*l.* 3*s.* 1*d.*
 XXXI. Diameter of lantern inside 11 feet, 8 feet high.
 XXXIII. For the five years ending 1858, 23*l.* 6*s.* per annum.
 XXXIV. 15*l.* 10*s.* per annum.
 XXXV. Two keepers. The principal, 7*l.* per year, with house and garden; and the assistant, 3*l.*
 XXXVI. Plates, plate glass, and reflectors cost in 1827, 420*l.*
 XXXVII. 16*l.* 8*s.* 3*d.* in 1857; 13*l.* 13*s.* 4*d.* in 1858.
 XXXVIII. 268 gallons in 1857; 269 gallons in 1858.
 XXXIX. The finest quality of Colza oil, 4*s.* 6*d.* per gallon in 1857; 3*s.* 11*d.* per gallon in 1858.
 XL. Cotton; in 1857, four pieces and two gross; 10*s.* in 1858, four balls and two gross.
 XLII. The light is maintained from the rates authorized to be levied under the Act already quoted.
 XLIII. None from this light.
 XLIV. 124*l.* 7*s.* 9*d.* in 1852-53; 219*l.* 11*s.* 8*d.* in 1858-59.
 XLV. No complaints.
 XLVI. None.
 XLVII. No complaints.
 XLVIII. No complaints.
 XLIX. No complaints.
 L. The lighthouse was inspected by the trustees, as well as by the treasurer.
 LI. 31st July 1857, 5th August 1858, by the Lord Provost and Magistrates of Glasgow, and other trustees; and by the treasurer at other times.
 LII. No.
 LIII. Three lamps and three burners kept in oil store in lighthouse lobby.
 LIV. A barometer and thermometer.
 LV. None.

- LVI. Signals unnecessary, as the lighthouse is on the mainland.
 LVII. See Rules and Regulations.
 LVIII. A copy sent herewith.

TOWARD LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Toward Lighthouse. See tracing sent herewith.
 II. The Cumbrae Lighthouse Trustees or Commissioners. See Act 29 Geo. II, cap. 20.
 III. Secretary, Angus Turner, Town Clerk, Glasgow; Treasurer and Superintendent, George Knight, 16, Robertson Street, Glasgow.
 IV. One light.
 V. Not now known.
 VI. Supposed to be by parties navigating the Frith.
 VII. Because it was considered the best for assisting in guiding vessels up and down the channel.
 VIII. In 1812.
 IX. Robert Napier, builder; Robert Stevenson, engineer. By contract.
 X. A leading harbour light.
 XI. Freestone; inner and outer walls; limewashed white below, and painted white above balcony.
 XII. Is fitted up with a lightning conductor.
 XIII. Sixty-three feet.
 XIV. Seventy feet.
 XV. This light is not intended, nor is it required, to be seen until a vessel has passed the Cumbrae lighthouse.
 XVI. About 10 miles.
 XVII. It may be seen from all points between N.E. by W. seaward, and W.S.W. 11 miles off.
 XVIII. Flashing light—white. Once every 52 seconds.
 XIX. Period of revolution, 2 minutes and 36 seconds.
 XX. From 20 minutes after sunset to sunrise.
 XXI. Catoptric holophotal.
 XXII. Three burners.
 XXIII. Altered from simple catoptric 11th November 1858, at the suggestion of the treasurer.
 XXIV. Reflectors, lamps, and frame, James Milne and Son, Edinburgh; lenses, by Chance Brothers and Company, Birmingham.
 XXV. Brass ventilators through wall below lights, and one in roof above lights.
 XXVI. None. See correspondence as to signals for Cumbrae lighthouse.
 XXIX. Cost 794*l.* 9*s.* 3*d.*, and there were expended as follows, viz.:— General repairs in 1833-4, 302*l.* 11*s.* 4*d.*; 1850-1, 450*l.* Repair of tower in 1858-9, 1,221*l.* 0*s.* 10*d.*; of house, 402*l.* 16*s.* 6*d.*
 XXXI. Diameter of lantern 12 feet 4 inches, and height 6 feet. Price of lantern, 325*l.*; of other iron work, 225*l.*
 XXXIII. For the five years ending 1858, 31*l.* 11*s.* 8*d.* per annum.
 XXXIV. 11*l.* 0*s.* 6*d.* per annum.
 XXXV. Two lightkeepers; the principal 60*l.* a year, with house, garden, and cow's grass; and the assistant 40*l.* a year.
 XXXVI. First apparatus cost 593*l.* 7*s.*; glass 9*s.* 18*s.* New illuminating apparatus with revolving frame cost 246*l.* 14*s.*
 XXXVII. 14*l.* 6*s.* 4*d.* in 1857; 9*l.* 0*s.* 8*d.* in 1858.
 XXXVIII. 122 gallons in 1857; 121 gallons in 1858.
 XXXIX. The finest quality of colza oil, 4*s.* 6*d.* per gallon in 1857; 3*s.* 11*d.* per gallon in 1858.
 XL. Cotton, 9*s.* in 1857; 8*s.* in 1858.
 XLII. The light is maintained from the rates authorized to be levied under the Act already quoted.
 XLIII. No income from this light.
 XLIV. 181*l.* 4*s.* in 1852-3, and 2,144*l.* 7*s.* 8*d.* in 1858-9.
 XLV. No complaints.
 XLVI. None.
 XLVII. No complaints.
 XLVIII. No complaints.
 XLIX. No complaints.
 L. The lighthouse was inspected by the trustees as well as by the treasurer.
 LI. 31st July 1857, 5th August 1858, by the Lord Provost and Magistrates of Glasgow, and other trustees, and by the treasurer at other times.
 LII. No.
 LIII. There are two sets of the old lamps in the oilroom. There is now one new spare lamp in the oilroom.
 LIV. A thermometer and barometer.
 LV. None.
 LVI. Signals are unnecessary, as the lighthouse is on the mainland.
 LVII. See Rules and Regulations.
 LVIII. A copy sent herewith.

Circular

IBRAE.
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CUMBRAE LIGHTHOUSE.—(SPECIAL RETURN.)

- I. The Cumbrae Lighthouse, on the island of Little Cumbrae, in the Frith of Clyde.
- II. The Cumbrae Lighthouse Trustees or Commissioners. See Act 29 Geo. II, cap. 20.
- III. Secretary, Angus Turner, Town Clerk, Glasgow; Treasurer and Superintendent, George Knight, 16, Robertson Street, Glasgow.
- IV. One light.
- V. Unknown, but it must have been of very ancient date. See date of Act.
- VI. Unknown, but supposed to be the owners of vessels plying on the Frith of Clyde.
- VII. Because it was considered the best for guiding vessels up and down the channel.
- VIII. Supposed to be in 1757.
- IX. The name of the engineer of the old lighthouse is unknown. Mr. Robert Stevenson was the engineer of the existing lighthouse.
- X. It may be truly called a leading harbour light, although situated in the Frith.
- XI. Stone; one wall, rough cast to balcony; painted white above balcony, and limewashed below.
- XII. There is now a lighting conductor there.
- XIII. Thirty-six feet.
- XIV. One hundred and fifteen feet.
- XV. About 16 miles.
- XVI. About 16 miles.
- XVII. From S. to S.W. 44 degrees; the light is visible 14 miles; and from S.W. round to N.E. by E. by N. it is visible at various distances as the land will admit.
- XVIII. A fixed white light.
- XX. From 20 minutes after sunset till sunrise.
- XXI. Catoptric; catoptric holophotal has been estimated for, and the treasurer intends to recommend their adoption.
- XXII. Fifteen burners.
- XXIII. None.
- XXIV. James Slight and Co., Edinburgh.
- XXV. Fifteen circular apparatus through wall, with brass regulators inside, under lights, and one in top of lightroom above the lights.
- XXVI. None. In 1856 the Trustees had under consideration the expediency of erecting a fog signal, and the correspondence (a copy of which is sent herewith) took place on the subject with the Trinity House, but it will be observed that the comparative efficiency of guns, bells, and whistles was with them a matter of question.
- XXVIII. Six days.
- XXIX. Cost cannot be ascertained, but there was expended as follows:—Lightroom, &c., cost for repairs in 1829 and 1830, 1,373*l*. 1*s*. 2*d*.; keeper's house &c., cost, in 1836, 1,537*l*. 5*s*. 7*d*.
- XXXI. Diameter of lantern 11 feet 2 inches, height of glass 4 feet 7 inches. Cost cannot now be accurately ascertained.
- XXXIII. For the five years ending 1858, 24*l*. per annum.
- XXXIV. 2*l*. 2*s*. per annum.
- XXXV. Two lightkeepers. The principal 60*l*. a year, house, garden, and cow's grass; and the assistant 50*l*. a year, house and garden.
- XXXVI. Cost in 1826, plates, reflectors, and plate glass, 47*l*. 16*s*.
- XXXVII. 16*l*. 6*s*. 3*d*. in 1857; 19*l*. 7*s*. 11*d*. in 1858.
- XXXVIII. 476 gallons in 1857, and 480 in 1858.
- XXXIX. The finest quality of colza oil, 4*s*. 6*d*. per gallon in 1857; 3*s*. 11*d*. per gallon in 1858.
- XL. Cotton; 16*s*. in 1857, three gross and four balls; 30*s*. in 1858, seven gross and four balls.
- XLII. The light is maintained from the rates authorized to be levied under the Act already quoted.
- XLIII. For the year 1852-3, 5,855*l*. 1*s*. 3*d*.; 1858-9, 5,936*l*. 11*s*. 3*d*.
(See returns for Cloch and Toward.)
- XLIV. 241*l*. 18*s*. in 1852-3; 317*l*. 1*s*. 11*d*. in 1858-9.
- XLV. No complaints.
- XLVI. None.
- XLVII. No formal complaints have been made.
- XLVIII. No complaints.
- XLIX. No complaints.
- L. The lighthouse was inspected by the trustees, and is constantly superintended by the treasurer.
- LI. On 31st July 1857 and on 5th August 1858 inspections were made by the Lord Provost and Magistrates of Glasgow, and other trustees, and by the treasurer at other times.
- LII. No.
- LIII. Fifteen spare lamps kept ready in the oil room.
- LIV. A barometer and thermometer.

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- LV. None.
- LVI. Communication with Millport, by hoisting a red flag; also with the passing steamers by hoisting a flag at a different place.
- LVII. See Rules and Regulations.
- LVIII. A copy sent herewith.

TABLE OF PRICES.

		CLOCH.—9 Burners. Catoptric.	
Price	-	-	Fixed. 420 <i>l</i> .
Ordinary repairs	-	-	15 <i>l</i> . 0 <i>s</i> . 10 <i>d</i> . per annum.
Oil	-	Consumption	- 269 gallons per annum. 8 gallons per 100 hours.
		Cost	- 44 <i>l</i> . 16 <i>s</i> . 8 <i>d</i> . per annum. 1 <i>l</i> . 6 <i>s</i> . 8 <i>d</i> . per 100 hours.
Wicks	-	Consumption	- 4 balls and 2 gross per annum.
		Cost	- 11 <i>s</i> . per annum.
		TOWARD.—3 Burners. Catoptric-holophotal.	
Price	-	-	Flashing light, white once every 52 seconds. 246 <i>l</i> . 14 <i>s</i> .
Ordinary repairs	-	-	11 <i>l</i> . 13 <i>s</i> . 6 <i>d</i> . per annum.
Oil	-	Consumption	- 122 gallons per annum. 4 gallons per 100 hours.
		Cost	- 20 <i>l</i> . 6 <i>s</i> . 8 <i>d</i> . per annum. 13 <i>s</i> . 4 <i>d</i> . per 100 hours.
Wicks	-	Consumption	- 2 gross per annum.
		Cost	- 8 <i>s</i> . per annum.
		CUMBRAE.—15 Burners. Catoptric.	
Price	-	-	Fixed. 474 <i>l</i> . 16 <i>s</i> .
Ordinary repairs	-	-	17 <i>l</i> . 17 <i>s</i> . per annum.
Oil	-	Consumption	- 480 gallons per annum. 12 gallons per 100 hours.
		Cost	- 80 <i>l</i> . per annum. 2 <i>l</i> . per 100 hours.
Wicks	-	Consumption	- 5 gross and 4 balls per annum.
		Cost	- 1 <i>l</i> . 3 <i>s</i> . per annum.

BUOYS AND BEACONS.

- I. The Cumbrae Lighthouse Trust.
- II. A chart sent herewith, and reference made to the Answer to query No. XVI., as to the cost of maintenance.
- III. Only as provided for by the Merchant Shipping Act, 1854.
- IV. None.
- V. A small model of each of the buoys used sent herewith
 - a. Some of wood and some of iron.
 - b. The iron buoys cost 40*l*.
 - c. 3*l*. per annum.
 - d. 2*l*. per annum.
 - e. Twenty-four in position, viz., 18 iron and six wooden.
 - f. Four iron and five wooden buoys in reserve.
 - g. At Clydebank Works, belonging to the Clyde trustees.
 - h. Four moorings and six mooring chains.
 - i. Two.
 - j. No. 1 supposed to have been struck by a raft of timber. No. 2 run down by a steamer.
 - k. By cast-iron mushroom moorings, and granite stone blocks to 1½ inch chains.
 - l. Has not been kept separate from other charges.
 - m. Generally by tender.
 - n. The buoys on the starboard hand have all been coloured red, and on the port hand black, chequered buoys marking centre dangers.
- VI. The new iron buoy, of which a model is sent, is thought to be an improvement on the others formerly used.
- VII. All the buoys are overhauled, scraped, and painted once every year.
- VIII. As above stated, they are overhauled once a year; and, besides, the pilots have orders immediately to report any buoy out of order.
- IX. The position of the beacons will be seen upon the sketch already referred to.
- X.
 - a. Stone beacons at Gantocks and Innellan. Wooden perch at Hunterston Sand. Stone beacons have just been erected at Birdie; and Port Glasgow, perches.
 - b. Cannot be ascertained.
 - c. To indicate the position of rocks or shoals.
 - e. See above a.
 - h. Average height above high water for Birdie and Hunterston perches 31 feet, and Port Glasgow perch about 26 feet.
 - i. Cannot be ascertained.
 - j. Cost not kept separate.
 - k. No income.

Circular V.

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- XI. The new iron buoy already referred to is being substituted for the others, when necessary.
- XII. The principles that have governed the buoying of the Frith have been to point out in the most efficient manner any rock, shoal, or sandbank.
- XIII. Ditto.
- XIV. From the rates authorized to be levied under the Act 29 Geo. II. cap. 20.
- XV. Ditto.
- XVI. No income. Expenditure, 1852-3, 214*l.* 11*s.* 5*d.*; expenditure, 1858-9, 242*l.* 11*s.* 3*d.*
- XVII. The only application for buoying any locality made to the trustees since 1853 was made on 5th July 1859, and a buoy was placed on Strone Point on the of same month. The application was made by Mr. John Mitchell, Shipowner, Glasgow.
- XVIII. None.
- XIX. In July 1857 and August 1858, by Mr. Charles Duncan, Clydebank Works, with a staff of men to scrape, paint, and repair, and replace where necessary.
- XX. See preceding answer.
- XXI. All buoys are immediately replaced, so that any information to the public is unnecessary.
- XXII. The trustees' workshops are situated at Clydebank, 12 miles from the nearest, and about 34 miles from the furthest away buoy, and the foreman there has instructions immediately to replace any buoy.
- XXIII. The pilots are in hourly communication with the office, 16, Robertson Street, Glasgow, and they have orders to report any accident to a buoy or beacon.
- XXIV. There have been no complaints.
- XXV. The only new buoy tried has been the new iron one already referred to.

COPY CORRESPONDENCE with the TRINITY HOUSE.

Glasgow, August 4, 1856.
SIR, THE Cumbræ Lighthouse Trustees have upon several occasions had under their consideration the propriety of erecting a signal upon the island of Little Cumbræ, to be used in times of foggy weather. They have felt much difficulty, however, in deciding as to the proper signal to be erected, to answer the end contemplated, viz., to warn masters and others in charge of vessels of their whereabouts during the periodical occurrence of fogs in the Frith of Clyde; and they have instructed me to write to you and bring the subject under your notice.

The Trustees have had several signals submitted for their consideration; but before adopting one or other of these, they would wish to be favoured with the opinion and advice of the Trinity House. Some parties recommend the erection of a large bell; others a steam whistle; and others that a gun should be fired at stated and advertised periods. The difficulty the Trustees have had in dealing with two of these recommendations has been that sound is so deceptive, and that a gun fired or bell rung at any of the towns on the coast might be taken for the fog signal, and so mislead in times of fog, and thus do more harm than good. They think that the sound of a whistle is distinctive and striking, that it is less open to the above objection, and that they would, although not authorized or called upon to do so under their Act, be willing to incur the expense of providing an effective steam whistle at the place referred to, should the Trinity House be of opinion that their doing so would be within the scope of their duty, and beneficial to the shipping of the Clyde.

I may add, that the question of a fog signal at the Cumbræ lighthouse has been fully considered by the more intelligent of the steamboat captains; that they all agree as to the expediency for some signal; that eight think a steam whistle would be the most effective, and that two prefer a bell.

I have, &c.
(Signed) GEO. KNIGHT, Treasurer.

Trinity House, London,
August 21, 1856.

SIR, HAVING laid before the Board your letter of the 4th instant, on the subject of the proposed establishment of fog signals on the island of Little Cumbræ, I am directed to acquaint you, that the Elder Brethren fully concur with the Trustees in opinion as to the advantage which vessels navigating that locality would derive from the proposed signals in thick and foggy weather, but that the comparative efficiency of guns, bells, and whistles for the desired purpose is still with them a matter of question.

The Elder Brethren entertain considerable doubt as to the efficiency of the bell, and having tried without success an air whistle worked by hand power have decided upon

making experiment of 18-pounder guns, to be stationed near the South Stack Lighthouse for the guidance of vessels navigating in that neighbourhood, the advantage of which has, however, yet to be proved.

The sound produced by a steam whistle may, perhaps, be more effective than that from compressed air, but the Elder Brethren consider that the time which must be occupied in the generation of a sufficient supply of steam to produce the required sound presents a material objection to the use of that description of instrument for a purpose which may at any time require it to be called into immediate requisition.

I am, &c.
(Signed) P. H. BERTHON, Secretary.

Year ending 11th November	Revenue.		Expenditure.		Surplus Revenue.		Proportion payable to Greenock Harbour Trustees.		Payable to Clyde Trustees above Greenock.		Cash paid to Clyde Trustees.	
	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.	£	s. d.
1845	3,658	16 11	3,551	14 4	2,101	2 9 1/2	350	13 9 1/2	376	15 10	1,376	13 2
"	3,630	19 0	2,252	5 7	1,378	13 5	229	15 7	250	0 0	808	17 3
"	3,878	5 6	1,697	8 3	2,270	7 7	378	9 3	270	4 1	1,622	3 8
"	3,666	4 0	1,617	2 1	2,049	1 5	336	10 3	83	12 5	1,598	18 9
"	3,850	6 6	1,558	3 10	2,292	6 8	382	11 4	281	15 8	1,628	10 6
"	4,252	16 6	2,425	6 3	3,827	10 5	301	11 9	241	19 8	1,280	19 0
"	5,379	4 3	1,772	11 2	3,606	10 1	601	1 8	1,184	15 11	2,866	12 6
Six Months ending 31st May 1852	2,786	0 3	476	8 3	2,309	12 0	381	18 8	83	18 0	1,840	15 4
"	4,855	1 3	911	11 1	1,913	5 4	748	18 5	91	4 9	4,000	6 4*
"	5,754	11 0	1,022	15 5	4,732	18 8	780	6 5	84	15 0	3,861	17 3
"	5,780	19 1	1,135	17 5	4,645	1 9	767	10 9	78	2 2	3,159	6 3
"	5,530	11 3	1,231	9 6	4,299	3 4	686	10 9	14	13 4	3,412	0 1
"	5,911	18 9	1,173	6 8	4,738	12 1	788	15 4	50	12 5	3,510	4 5
"	5,931	11 0	1,121	1 0	4,810	10 10	801	15 1	37	18 5	3,779	18 5
"	5,536	11 2	3,006	19 0	2,529	12 2	488	5 4	59	6 0	2,312	10 10

Glasgow, 14 Jan. 1860.—GEO. KNIGHT.

* This includes 96*l.* 14*s.* 9*d.* of arrears received from Trinity House.

CUMBRÆ LIGHTHOUSE TRUSTEES, &c.

Met at Harbour Board the Lord Provost and members of Harbour Board, or, rather, Clyde Trust, and also Cumbræ Light Trust.

Found that much complication exists as to the duties, revenue, &c. of the Cumbræ Light Trust. The Cumbræ Light Trust was established by Act of Parliament in 1755, and was permitted to levy a toll of one penny a ton on every vessel passing Cumbræ light. The proceeds to be laid out first in improving the lighting and then in improving the river, one-sixth of surplus being given to Greenock, and five-sixths to improving river above Greenock.

The Cumbræ Commissioners state that, having no appliances for improving the river, they have for many years handed over the five-sixths to the Clyde Trust for that purpose, whose receipt and proof that they

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by Com-
missioner

CUMBRAE.

have laid out more than the surplus, is considered sufficient.

The Cumbrae Light Commissioners form nine twenty-fifths of the Clyde Trust. The money has nearly all been spent up the river, and Port Glasgow receives no benefit. This is very much complained of by the shipowners of Port Glasgow, who claim for their port under the Act a right to participate in the benefit derived from the expenditure of the revenue to which they contribute.

Captain Bryce, "Harrier," screw steamer, Liverpool, constantly running, considers all well lighted, buoyed, and beacons outside. Would like to see Gammels Point between Greenock and Port Glasgow better marked, and suggests lighting by a floating light. A fog signal at Cumbrae would be very useful.

General.—Outer buoy at Liverpool first rate, but bell does not ring.

Bidston light good. The blue lights, occasionally displayed at the lightvessels are useful.

Captain Gibson, "Gypsy Queen," thinks if Cumbrae light was changed from fixed to revolving he should not mistake it on approaching from seaward, as he does now, for a masthead light.

The Clyde buoys are quite sufficiently numerous. Three to one as numerous as are the buoys at Liverpool.

General.—The spit buoy at Liverpool "*splendid*." Kingston buoy on Holy Island off Arran Island should be lighted, as the roads are a harbour of refuge for south-west gales; has seen 130 vessels there at one time. Sees Bidston light before north-west light-vessel. Does not care for blue lights; rockets would be better.

Captain Eaglesome, screw schooner "Eagle," Londonderry.—A light at Gammels Point would be useful.

Buoys opposite Gammels Point are too small; has touched the bank.

Quite satisfied with lighthouses from hence to Londonderry, finds no inconvenience in Innishowen lights being of same height.

Skerries should be lighted.

Londonderry and Clyde both equally well lighted.

A fog bell at Cumbrae would be useful. Thinks a gun could not be mistaken for a ship's gun.

Captain McClery, "Princess Royal," Liverpool.—Gammels Point should be lighted. Buoys in its neighbourhood too small.

The red light and white light on Port Glasgow quay are leading lights. They are too close to one another. The white light is too low and is lost among gas lamps; the red light is obscured by the white light. The Clyde Commissioners stated they were going to move the outer or white light to the Perch, and light it by gas from the shore in a sunk pipe. It will never be put out entirely, and they think if the glass is cleaned once a week it will be sufficient.

The red light at Donald's Quay is inefficient, and would be useful if improved. Is quite satisfied with Cumbrae.

A buoy on north end of Bahama Bank would be very useful. Bell buoy at Liverpool does not ring well. Advocates a uniform system of buoyage.

Captain Hardie, "Leopard," 435, Belfast mail boat.—Would like to see a light on Gammels Point.

Rathleigh Quay should be lit. Buoys in neighbourhood of Gammels Point too small.

General.—A gun at Cumbrae would be very useful in fog.

Advocates uniform system of buoyage, red and black. Light at Holy Island, Lamlash Bay, would be very useful; have seen 200 or 300 sail take refuge there.

Captain Boyd, retired, 48 years at sea:—

A floating lightvessel should be placed at Gammels Point.

A buoy on Bahama Bank.

CUMBRAE.

Captain White, "Lynn," 310 tons, steamer, Belfast.—Donald's Quay should be brighter.

Rathleigh Quay should be lighted.

Cumbrae lights very good. Would like a fog signal at Cumbrae.

Uniform system of buoyage would be a great advantage.

Jas. Morris, pilot 13 years:—

Gammels Point requires to be better marked; perhaps a lightvessel would be in the way, and her light might be confused with the other lights. She would be moored head and stern. Port Glasgow leading lights of no use as now placed. Donalds' Quay light of no use.

Upper channel of river is well lighted; thinks new channel above Port Glasgow has shoaled 18 inches.

James Murray, pilot 11 years:—

Larger buoys should be placed on Gammels Point.

Lights of the upper part of river quite distinct; a distinct light at Gammels Point would be good. Donalds' Quay light should be moved and made good.

A gun, at Cumbrae every few minutes in a fog would be a great advantage. A gong for the Cloch light would be advantageous.

Luke Shelley, pilot eight years:—

Thinks buoys too small at Gammels Point. Centre buoys should be very large. Elbow buoys generally should have perches.

Captain Crauford, shipping master:—Well acquainted with Clyde; considers it well lighted and buoyed. A buoy on north-west end of Bahama Bank would be useful.

Light on North Rock off coast of Ireland should be moved further out.

A light on southern entrance of Lamlash Bay would be very useful.

Captain Small, examiner to Local Marine Board, would approve of light placed on the Perch Shoal if the glass can be kept clean. Cumbrae light requires a fog signal. An air signal has been invented and exhibited in Glasgow. Thinks a bell buoy off the Rock at the entrance to Lamlash would be better than a light, as the harbour is required in south-west winds, when the light would be obscured by fog, &c.

The Admiralty Charts and Book of Directions give North Rock wrong, placing the lighthouse at the extreme. Thinks horizontal stripes, red and white, for lighthouses, show best in fog.

Mr. Smith, shipowner:—North Rock light is considerably inside the dangerous point. Ships make too free with North Rock, dreading the wind heading. Thinks Cumbrae light does not excessive, but that they should only be spent on lights and buoys, although the Act of 1755 permits of their present employment. There are no extensive shipowners among the Cumbrae Light Commissioners.

Of the Clyde Trust one-third, or, strictly, ninety-two-fifths, are now since the last Bill, shipowners' and the other one-third elected by Cumbrae Trust.

Mr. Smith thinks the new cut a mistake, as the old one is left. The corners of the old channel ought to have been rounded off.

If Cumbrae lights dues were reduced no fund would remain for clearing obstructions below the limits of the Clyde Trust, which terminates *above* Port Glasgow. Thinks all parties who benefit by lights should pay for them. Many vessels plying within Cumbrae now pay no light dues whatever, as they are only levied on vessels *passing* Cumbrae. Would regret to see the management of local lights centralized. Clyde Trust report annually, Cumbrae Commissioners do not.

Mr. Gilmour, a shipowner, largely interested in the prosperity of Port Glasgow, also a Clyde Trust Commissioner returned by the Chamber of Commerce:—

Quite satisfied with the efficiency of the lights, buoys, and beacons of the Clyde, but very much dissatisfied as to the way in which the *surplus* of the

CUMBRAE.

—
Observations
by Commissioners,
and
Evidence.

CUMBRÆ.

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Observations
by Commis-
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Evidence.

Observ-
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light dues received by the Cumbræ Light Commissioners is disbursed.

In 1755 Port Glasgow was the port of Glasgow, and the arrangement that one-sixth of the surplus light dues should be transferred to Greenock and five-sixths spent on the river improvement above Greenock, evidently contemplated that the five-sixths should be spent between Greenock and Port Glasgow. Now the impediment, the Perch Shoal off Port Glasgow, is a shoal interfering very much with the trade of Port Glasgow, and ought, evidently, to be reduced out of the surplus.

In consequence of impertunity, 5,000*l.* was laid out some years since, but the work was never finished, and is, therefore, useless. Mr. Walker's report is under consideration. Think, on principle, that light dues should be reduced to light requirements.

He would prefer that the rate be lowered, and expended only on lights; in this way the question would be settled, as the surplus would cease to exist; but an Act is required to do this. He objects to the lights being charged to the consolidated fund, as we should thereby lose the charge on the foreign shipping and lay out the revenue more stingily.

The late Bill protects Port Glasgow (see its last clause).

There is a temptation to Glasgow men to injure Port Glasgow and Greenock. Has suggested that Port Glasgow be amalgamated with Glasgow, the former paying a fair consideration.

Mr. Knight, secretary:—There is no power under Act to raise money for Clyde Trust on the security of the light dues; although, no doubt, mortgagees consider that the surplus is a guarantee.

There is a sub-committee for improving the lights, &c. Three new reflectors and lenses, at 60*l.* each, have been supplied lately to Toward light.

Trinity Board, when consulted about fog signals, declined to decide between guns, bells, and whistles. The Cumbræ Commissioners declined therefore to incur the risk of adopting any kind of fog signal.

Visited the lights, &c. on the river Clyde, in a steamer placed at our disposal by Clyde Trust, accompanied by the secretary and the engineer.

Great improvements are being carried out in deepening and widening the river.

Passed Donald's Quay light without visiting. It is a lamp raised on a sheer, but is so retired from the banks of the river that it is of little use.

The beacons appear very efficient; they are various in shape. A common description being large cairns made of stone.

Visited Dumbruck light. One Argand, paraffine oil, in a pile lighthouse. The house is damp, and the fire smokes very much. Lamp requires more ventilation. The keeper's name is James Daniel. Three years in lighthouse; had belonged to the Dredge Establishment.

Visited Garmoyle floating light. Double Argand in hexagonal lamp. The lamp was turned the wrong way, so as to show the most light where it was not required. Reflectors would be beneficial. Vessel, a decked boat, moored head and stern close to a cairn beacon.

Visited Cardross light. A dioptric, in a pile lighthouse. Colour of light, red.

The last-mentioned light is only lately erected, and is very good. We noticed that the old-fashioned spare lamps were at the lighthouse, but no spare one for the new dioptric light.

It was our opinion that the lights above Cardross were likely to be inefficient for thick, dirty weather.

30th September, 8*o* am.—Weighed in the steamer placed at our disposal by the Clyde Trust, and still accompanied by the secretary and the engineer, proceeded to inspect the Cumbræ lights. Tried an interesting experiment at Cumbræ. On leaving in the steamer, directed the keeper to fire one of his guns as often as he saw us hoist a flag at the fore, and if, owing to our distance and the thick wet foggy state of

the weather, he could not make out our flag, then to fire when he saw the vessel turned broadside to him and a puff of steam from the funnel. We steamed towards Toward light and made the prescribed signal three times. At more than three miles we heard the gun distinctly. Of course in a steamer the noise of the paddles and of the escape of the steam interferes with and destroys the probability of the report being heard. The charge was $\frac{1}{2}$ lb.

The opinion of the lighthouse keeper at Cumbræ that the report would reverberate and mislead by its echo against distant hills, is valuable, and its truth should be tested by vessels placing themselves in various positions. But, if true for Cumbræ, the fact would not affect the value of a fog gun for other places. There was reported to be fog for about 200 hours at Cumbræ during the last year. If a gun was fired at six-minute intervals, and powder cost 8*d.* a lb., then as each report would cost 1*s.*, 2,000 charges would cost about 100*l.* at Greenock.

The Provost of Port Glasgow attended to give evidence.

He considered the lighting, buoys, and beaconing satisfactory; but held the same opinion as to the misappropriation of the Cumbræ light dues. He is aware that the Clyde Trust, *as such*, cannot dredge the Perch, because it is out of their limits. It must be the act of the Cumbræ Light Trust.

The pilots think the three Cumbræ lights very good; Toward much improved recently. They think a light off Gammels Point would be very useful, and would be a leading light to and from Cumbræ light. State they cannot take vessels to Port Glasgow drawing within two feet of what they did formerly.

Fullerton Rock should have a bell buoy on it.

A light at Port Crauford to show vessels into Fairlie Roads would be useful, as in a north-west gale vessels soon shut in Cumbræ light. Have seen 12 vessels in Fairlie Roads. Have seen 180 vessels weather bound in Lamlash Roads.

Sanda light in Mull of Cantire is a red light, and is very dull in bad weather.

There should be a large buoy on Patterson Rock with a bell and beacon.

Three vessels lately wrecked off Sanda.

Channel to Port Glasgow filling up. Opposite Greenock also filling up; two feet in last five to seven years.

Skelmorlie Bank should have a bell buoy; dangerous for deep ships; and spit from Toward Point should have a bell buoy.

Captain Wallace trades between Jamaica and Glasgow.—Has made many voyages.

The existing lights are very good. Toward light shining more brilliant this last voyage, but would much like to have one at Lamlash Harbour to point out the harbour, and be a leading light up to Cumbræ. Has taken shelter in Lamlash Roads 50 times. Entrance dangerous to strangers. Does not open Pladda until nearly abreast of it when making Lamlash Harbour.

John Miller, harbour master, Greenock:—

Lamlash wants lighting.

Gammels Point do.

The buoy on Skelmorlie was removed at the request of owners of sea-going steamers.

Banks off Greenock filling up, injuring Port Glasgow.

Considers tendency of dredging above Port Glasgow is to silt up channel leading to it.

ALFRED P. RYDER.

S. R. GRAVES.

At Glasgow, on the 8th of September, Dr. Gladstone called on and saw Mr. Angus Turner, town clerk and ex officio secretary of the Cumbræ Trust. He also called on and saw Mr. G. Knight, the treasurer and superintendent, and was assured by him

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that the Cumbrae Commissioners having large funds desire to have everything in the best style. They contemplated changing the illuminating apparatus at the Cumbrae and Cloch to holophotal or dioptric.

They are about to place a lighted beacon on a bank in front of Port Glasgow.

They are changing the wooden buoys, which are often struck and sunk, for iron ones. The form preferred is something like that of a top. Other information about jurisdiction was elicited.

At Greenock two gas lamps were seen, which are used as leading lights. The upper one, like an ordinary street lamp, has a red pane towards the sea. The lower one is all red, and is said to have several burners.

The Cloch lighthouse was also visited. It answers to the description given in the return, and appeared in good order, the only exception being that the store for oil and glasses is very dirty and damp. The cross bar of the lantern is just on a level with the flames of the lamps, and two of the astragals (which are very thick) are exactly in front of the centre of a reflector, one of them being the important mirror which directs the beam of light up the river.

September 9.—An attempt was made to reach the Cumbrae light by steamer, but abandoned on account of the stormy weather rendering it almost certain that a landing could not be effected. On descending the Clyde, however, the innumerable beacons were observed. At first, black wooden posts with devices on top, afterwards similar devices, red on one side of the channel and black on the other, placed on cairns of stone masonry, some of which were structures of considerable pretensions. Buoys similarly coloured were also abundant, and those of the form indicated rode very well in the sea that was then raging. There were also perches, long poles with devices supported by wooden stays. The Dumbuck light was passed, a stone erection in the river and at the side of the deep channel like a Martello tower, low and painted red; also two leading gas lamps on Bowling pier. The Garmoyle floating light, a small vessel, anchored in the channel, fore and aft, near a cairn which supports a tide gauge. Cardross light, a tower like the Dumbuck, but black with white top; and also the leading gas lamps, green, on the pier at Port Glasgow.

On the 10th, further information was obtained at the office, but only such as is recorded elsewhere. The light on the Broomielaw, which is denominated a bude light in the Admiralty list, was found to be only two large gas lamps, the jets being arranged on three concentric rings. The glass was very dirty, and on the night of the 8th the lamps were burning with a very poor flame.

On the 1st of October, the Garmoyle light was boarded by Dr. Gladstone, and it was found that Captain Ryder and Mr. Graves had been there the previous night. The keeper, who lives there with his wife, little son, dog, and cockatoo, said that he had had no relief whatever for the last 20 years. He has a boat. The lamp consists of a cistern with two arms placed at an angle, each provided with a straight wick. It does not swing, and hence on rough nights much oil is spilt and much smoke produced; even then, after a calm night, there were dark patches on the glass of the lantern. There are no reflectors or lenses. The Garmoyle light has sometimes broken adrift. As coals were being taken in at the time no opinion could be formed of the general cleanliness or tidiness. A gunner at Dumbarton Castle, two boatmen, and the commander of the "Neptune," Kilmun, steamer bore testimony to the general efficiency of the lights. They said they knew of no complaints, but acknowledged fully that the Cloch was much brighter than any of the Clyde lights.

From subsequent correspondence with the authorities at Glasgow and with persons interested in the navigation of the Clyde and the payment of light dues,

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and from statements made to the Commissioners, it appears that a surplus exists, and a difference of opinion as to the disposal of it, especially with reference to a mud bank near Port Glasgow.

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DUMFRIES.

LLOYD'S EVIDENCE.

Circular VI.

I. Francis Nicholson, merchant, and agent for Lloyd's, and commissioner of Nith navigation.

II. DUMFRIES.

III. Commissioners of Nith navigation, by Act of Parliament, 1811.

IV. So far as I know.

V. I have no suggestion to make.

VI. None to name.

VII. Seal oil.

VIII. Never that I heard of.

IX. Regularly attended to, and when displaced on the channel, shifts are as soon as possible placed in the fair way.

X. None to my knowledge.

XI. None used or wanted, as far as I know.

XII. None used; nor have I heard a complaint from the want of them.

XIII. Black, white, chequered, and red.

XIV. No.

XV. No charge.

XVI. See answer to No. IX. If any complaints, they are attended to without delay.

XVII. I hear no complaints.

XVIII. No charge made in the port for lights, buoys, or beacons.

XIX. Yes.

XX. I have no complaints.

I inclose a form filled up by Mr. William Turner, a Nith Navigation Commissioner, and who has a considerable interest in shipping connected with the port.—Dumfries, 13th Jan., 1860.

Circular VI.

I. William Turner, brewer and shipowner, Dumfries.

II. DUMFRIES.

III. Commissioners of Nith Navigation.

IV. Yes.

V. Can point out no improvement.

VI. None wanted.

VII. Oil.

VIII. Not aware of any.

IX. Regularly attended to, and kept in their place.

X. Does not know any.

XI. Not used, nor wanted.

XII. Not used, or any required.

XIII. They are coloured red, black, white, and chequered.

XIV. No change wanted.

XV. None charged.

XVI. No complaints addressed to the commissioners of tonnage.

XVII. The general feeling is good.

XVIII. No charge is made for buoys or lights.

XIX. Yes.

XX. I am not aware of any general opinion as to the management of lights and buoys, there being no complaint.

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RIVER TAY LIGHTHOUSES.—(GENERAL RETURN.)

Circular II.

I. The Trinity House of Dundee, known as "The Fraternity of Masters and Seamen in Dundee." Incorporated by Royal Charter of his Majesty Geo. III., of date 19th September 1774; a copy of which is herewith sent.

II. Two light towers at Biddonness, on the north side of the estuary of the Tay; two light towers at Ferryport-on-Craig, on the south side of the Estuary; and another lighthouse lower down on the same side of the Estuary, known as the Pile Light. The lower light on the south side has not been lighted since the erection of the Pile Light in 1848. A copy of the chart of the Tay, made under

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Circular 11.

the authority of the Trinity House in 1855, by D. and T. Stevenson, Civil Engineers, from a survey by James Andrews, is herewith sent. The position of the lighthouses is shown on this chart, and a special return for each lighthouse accompanies this return.

- III. The lights of Tay, being leading lights, the sites have been chosen so as to lead in the best channels.
- IV. This is an engineering question, and the answer to it must depend on circumstances. The lights under this authority have been found to answer the purpose for which they are intended.
- V. All catoptric, consisting of parabolic reflectors, furnished by advice of Messrs. Stevenson.
- VI. These lights being local lights, and all for leading through narrow channels, have been made fixed under the direction of the late Mr. Robert Stevenson.
- VII. All the lights under this authority are fixed, and of the same character.
- VIII. The lights under this authority are white lights, and have been made so agreeably to explanation given in No. VI.
- IX. The apparatus is similar to that employed in the Northern Lights' service. Special drawings of the apparatus in each light tower have been prepared under the direction of Messrs. Stevenson, and accompany this return.
- X. The table referred to, so far as it is possible, has been filled up, and is attached to this return.

TABLE OF PRICES.

UPPER CRAIG.—Catoptric. 2 Burners. Argand. 21-in. reflectors.

Price	-	-	-	Fixed.	About 80 <i>l</i> .
Ordinary repairs	-	-	-	No special account kept for this lighthouse.	
Oil	-	{	Consumption	About 80 gallons per annum.	
			Cost	About 3 <i>s</i> . 4 <i>d</i> . per gallon.	
Wicks	-	{	Consumption	About 2 to 2½ gross of wicks per annum.	
			Cost	12 <i>s</i> . 6 <i>d</i> . per annum.	

LOWER CRAIG.—Extinguished—ready for use in case of accidents to the pile light. Catoptric. 1 Argand. 21-in. reflector.

Price	-	-	-	Fixed.	About 40 <i>l</i> .
Oil	-	{	Consumption	See margin.	
			Cost		
Wicks	-	{	Consumption		
			Cost		

PILE LIGHT.—Catoptric. 1 Argand. 25-in. reflector.

Price	-	-	-	Fixed.	About 50 <i>l</i> .
Ordinary repairs	-	-	-	No special account kept for this lighthouse.	
Oil	-	{	Consumption	About 40 gallons per annum.	
			Cost	About 3 <i>s</i> . 4 <i>d</i> . a gallon.	
Wicks	-	{	Consumption	1 gross per annum.	
			Cost	5 <i>s</i> . per annum.	

UPPER LIGHT, BUDDONNESS.—Catoptric. 2 Argands, pointing towards Tay Bar and one towards Dundee. About 24½-inch reflectors.

Price	-	-	-	Fixed.	120 <i>l</i> .
Ordinary repairs	-	-	-	No special account kept for this lighthouse.	
Oil	-	{	Consumption	About 120 gallons per annum.	
			Cost	About 3 <i>s</i> . 4 <i>d</i> . per gallon.	
Wicks	-	{	Consumption	About 3 gross.	
			Cost	5 <i>s</i> . per gross.—15 <i>s</i> .	

LOWER LIGHT.—Catoptric. 2 Argands, pointing towards Tay Bar. 21-in. reflector.

Price	-	-	-	Fixed.	80 <i>l</i> .
Ordinary repairs	-	-	-	No special account kept for this lighthouse.	
Oil	-	{	Consumption	About 80 gallons per annum.	
			Cost	About 3 <i>s</i> . 4 <i>d</i> . per gallon.	
Wicks	-	{	Consumption	About 2 gross.	
			Cost	5 <i>s</i> . per gross.—10 <i>s</i> .	

By order of the Corporation,
JAS. McEWEN, Secretary.

Trinity House, Dundee,
4th July, 1850.

- XI. Oil, annually contracted for; and the opinion of Messrs. Stevenson, the Engineers, taken as to quality and price.

XII. Lights at Buddonness too far distant from sea to require fog signals. At the Pile lighthouse, a bell is kept constantly going by machinery in foggy weather, principally with the view of preventing vessels running foul of the structure.

XIII. Lights so situated as not to require tide signals.

XIV. No formal application has been made to this authority since 1845; but in the year 1847 a discussion having arisen as to the propriety of improving the mode of lighting the Tay, a lighthouse was erected in the bed of the river below the Ferry-port-on-Craig Lights in the year 1848, at the expense of this authority, under the superintendence of Messrs. Stevenson, Civil Engineers, and with the approval of the Commissioners of Northern Lighthouses and the Lords of the Admiralty. This light is known as the "Pile Light." *Vide* chart.

XV. There is hereto attached a return of the total income and expenditure for the maintenance of light-houses, buoys, and beacons under this authority, from 1845 to 1858. The income is derived in a slump sum for lights, buoys, and beacons, and the expenditure is also kept in slump.

XVI. The Corporation has always followed the advice of the Messrs. Stevenson.

XVII. None.

XVIII. Copies of the rules and regulations for the guidance of the lighthouse keepers are hereto attached.

XIX. In forwarding the various returns to the Royal Commissioners, the Committee have endeavoured to give as full information as possible; but no question has been put as to the application of the surplus revenue arising from the lights. The Committee desire to refer the Royal Commissioners on this point to the return made by the Incorporation to the Select Committee of the House of Commons on Lighthouses in 1845 (Appendix to their Report, p. 665), and to the memorial and opinion of Counsel (on pages 666, 667, and 668 of that Appendix), showing their authority for the application of the surplus revenue. They also desire to refer to the evidence given by Captain Thomas Ewing, before the Select Committee on 19th May 1845 (printed evidence, page 125), and to that by Captain John Kennedy (page 128); as also to that of Captain John Washington, then Captain in the Navy, and Admiralty Surveyor in charge of the North Sea and East Coast Survey, and now Hydrographer of the Admiralty, on the subjects of the lighting and buoying of the Tay (page 137), queries 2310—15, and queries 2328—30. It will be observed from the whole of the evidence laid before the Select Committee of the House of Commons, that the lighting and buoying of the Tay is in a most efficient state; and further, that the services of the master and committee are gratuitous, with the view of aiding their poorer brethren in indigent circumstances.

Since the lighting and buoying of the Tay was so highly spoken of before the Select Committee of the House of Commons in 1845, numerous improvements have from time to time been made, with the view of affording greater facility to the mariner. In particular it may be mentioned—

1. That there are additional buoys laid down.
2. A new lighthouse, erected at a cost of about 1,600*l*.
3. The upper light in conjunction with this light raised about 20 feet.
4. A new beacon erected on the land; and
5. A new and improved chart of the Tay was published by the incorporation last year from a survey by James Andrews, under the superintendence of Messrs. D. and T. Stevenson, Civil Engineers, Edinburgh, at a large cost; a copy of which accompanies this return.

Should there be anything defective in the returns now made, the Secretary to the Committee will be glad to supply any information that may be required by the Royal Commissioners; but the returns have been prepared with great care, and it is to be hoped no omissions have been made.

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STATEMENT showing the Total Income and the Total Expenditure on Maintenance of the Tay Lighthouses, Buoy, and Beacons, in each year since January 1845, in terms of the requisition of the Royal Commissioners on Lights, Buoy, and Beacons:—

	1846.		
Income	-	£1,802	5 7½
Expenditure	-	1,118	1 7
Surplus	-	£ 684	4 0½
	1847.		
Income	-	£1,844	19 10
Expenditure	-	933	15 4½
Surplus	-	£ 911	4 5½
	1848.		
Income	-	£1,684	2 0
Expenditure	-	1,128	12 10½
Surplus	-	£ 555	9 1½
	1849.		
Income	-	£1,512	18 0½
Expenditure	-	1,737	14 9½
Excess of Expenditure	-	£ 214	16 9

Note.—It appears necessary to mention that the large expenditure on the two previous years, 1848 and 1849, arises from the cost of the erection of the Pile Lighthouse referred to in the Returns.

	1850.		
Income	-	£1,556	9 8
Expenditure	-	785	1 8½
Surplus	-	£ 771	7 11½
	1851.		
Income	-	£1,506	14 1½
Expenditure	-	458	10 0½
Surplus	-	£1,048	4 1
	1852.		
Income	-	£1,389	16 0½
Expenditure	-	565	5 7½
Surplus	-	£ 824	10 5
	1853.		
Income	-	£1,556	6 10
Expenditure	-	587	18 5
Surplus	-	£ 968	8 5
	1854.		
Income	-	£1,548	16 0
Expenditure	-	596	17 5
Surplus	-	£ 951	18 7
	1855.		
Income	-	£1,483	17 9
Expenditure	-	622	9 11
Surplus	-	£ 861	7 10
	1856.		
Income	-	£1,604	18 11
Expenditure	-	563	0 11½
Surplus	-	£1,041	17 11½
	1857.		
Income	-	£1,691	1 6
Expenditure	-	586	19 10
Surplus	-	£ 1,104	1 8

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	1858.		
Income	-	£1,452	19 9
Expenditure	-	791	10 0
Surplus	-	£ 661	9 9

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Circular II.

Note.—It is proper to mention that the expenditure this past year has been greater than in preceding years, arising from Messrs. D. and T. Stevenson, Civil Engineers, Edinburgh, having surveyed the river, and furnished the new chart referred to in the Returns.

On the 26th of July, the Commissioners, in the "Vivid" steamed from the Bell Rock for Dundee. The channel was well buoyed. A pilot was taken on board from a boat which was setting buoys, and had two on board which she had taken in. They are coloured black on the left, red on the right, going in (see Question XII.).

Observations by Commissioners.

This is the reverse of the Hull system of colouring buoys, and the same as that at Liverpool.

The lighthouses, under charge of the Corporation, were observed on entering the Tay. They are white, and show well against the hills, better than those of the Commissioners of Northern Lighthouses, which are generally of uncoloured stone, and in certain situations are not easily made out against the background.

The Commissioners visited Dundee on the 27th, and on leaving it, after visiting their lights, considered that the service generally is carefully attended to.

Examined Captain John Speck, master of the "pilots, who praised the lights, buoys, &c. under the Corporation, but thought that the Pile light was rather low down. It is to be seen in one with lights on shore when running up the channel, and vessels, in his opinion, open the lights rather too quickly when beating.

Captain William Lee, commanding one of the "London steamers, considers the Pile light to be properly placed.

Mr. James Sampson thinks "the buoys in the river very well kept, and the harbour lights very good.

David MacEachan thinks there is little matter. Buddoness lower light should be darkened on approaching the shore; it was formerly marked by a sandhill, which was purposely removed. He thinks "the Pile light is properly placed. The two lights open quickly. The buoys are good; he has no fault to find with them.

George Baird agrees.

The Corporation considers that the Pile light would be better placed on shore; it would be more easily kept, and less expensive. It would not open so quickly for vessels beating up. The masters of sailing vessels consider the quickness a great advantage.

The Commission visited the house of the Corporation, and inspected the buoy store, which was in good order.

Called on the chairman of the Chamber of Commerce, Mr. Flemming, and, after some conversation, asked him to consult with the other merchants, and communicate the result of their deliberations.

BUDDONESS HIGH LIGHT.—(SPECIAL RETURN.)

Circular III.

I. Buddoness High Light, in the parish of Barry, and county of Forfar.

II. Fraternity of Masters and Seamen in Dundee, incorporated by Royal Charter of his Majesty George III., of date 19th September 1774. See copy Charter, which accompanies General Returns.

III. James McEwen, Secretary, Trinity House, Dundee.

IV. There are three lights, two showing eastward, and the other westward in the same lantern. The High Light is about 1,140 feet apart from the Lower Light.

V. Unknown.

VI. Unknown.

VII. The obvious reason is, to lead over Tay bar in the best water.

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Circular III.
- VIII. Not known. Tower raised in 1815, when the Low Light built.
- IX. Not known.
- X. Leading light for River Tay.
- XI. Stone and lime; solid; coated outside with Roman cement and oil painted, colour white.
- XII. Fitted with lightning conductor; on the ordinary principle, consisting of copper bar.
- XIII. Seventy-four feet. Note; base not visible from water.
- XIV. Seventy-one feet.
- XV. Nine nautic miles.
- XVI. Fourteen and a half nautic miles.
- XVII. Visible for about 42° from about N. W. to about N. 4° W.
- XVIII. Fixed; white.
- XIX. None; fixed.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. Three burners.
- XXIII. None.
- XXIV. Not known.
- XXV. By ventilating tubes.
- XXVI. None. From situation, these not requisite.
- XXVII. None.
- XXVIII. Twenty.
- XXIX. Not known, the tower being very ancient.
- XXX. All completed.
- XXXI. Lantern 8 feet 1½ inches diameter to glass. Height of daylight, 5 feet 3 inches. The cost has not been separately kept.
- XXXII. No.
- XXXIII. About 50*l.* for the last five years.
- XXXIV. Average annual cost about 10*l.* Done by contract annually.
- XXXV. One keeper; salary 60*l.* per annum, with free house and garden, coals and light, with uniform. The keeper referred to is relieved in watching by the keeper of the Lower Light.
- XXXVI. Not separately preserved.
- XXXVII. There are about one and a half dozen of cylinders used annually, at 5*s.* per dozen; the other items are not separately preserved.
- XXXVIII. About 120 gallons of oil, and 3 gross of wicks.
- XXXIX. Colza oil, price 4*s.* 3*d.* per gallon in 1857-8.
- XL. Best unbleached cotton wicks, 5*s.* per gross, 15*s.*
- XLI. None. These not requisite.
- XLII. The lights are maintained out of the funds of the incorporation. These funds consist of the contributions of the members, rents of lands, and dues exacted from vessels entering the estuary or Firth of Tay, and are collected by parties appointed by the incorporation at the different ports and creeks in the Tay.
- XLIII. No separate account kept for this tower. See General Return, No. XV.
- XLIV. See answer No. XV. of General Return.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. By the Master and Committee of the Trinity House, Dundee, and by Messrs. Stevenson, Engineers, in 1858.
- LI. Lights inspected monthly by the Master and Committee of the Trinity House, Dundee.
- LII. No.
- LIII. Oil stored in base of tower in tanks. Three spare burners.
- LIV. One barometer, one thermometer. There is also a timepiece.
- LV. No tide signals used. The Fraternity do not, from the position of the lights, consider that it would be prudent to attempt to indicate the depth of water at all times over Tay bar.
- LVI. A gun and rockets are used when necessary in cases of stranding, in order to procure assistance from Carnoustie or Broughty Ferry, and to man the lifeboat.
- LVII. See answer to No. XXXV.
- LVIII. See copies of Rules and Regulations attached to No. XVIII. of General Return.
- DUNDEE.**
Circular III.
- II. Fraternity of Masters and Seamen in Dundee. Incorporated by royal charter of his Majesty, George III., of date 19th September 1774. See copy charter which accompanies General Return.
- III. James McEwen, Secretary, Trinity House, Dundee.
- IV. One light showing eastward 1,140 feet apart from the high light.
- V. Unknown.
- VI. Unknown.
- VII. The obvious reason is to lead over Tay bar in the best water.
- VIII. In the year 1815.
- IX. The late William Thomson, Builder in Dundee, by contract; the late Robert Stevenson, of Edinburgh, Engineer.
- X. Leading light for River Tay.
- XI. Stone and lime, solid, coated outside with Roman cement, and oil painted; colour white.
- XII. Fitted with lightning conductor on the ordinary principle, consisting of copper bar.
- XIII. Fifty-two feet. Note, base not visible from water.
- XIV. Forty-six feet.
- XV. Seven and a half nautic miles.
- XVI. Twelve and a half nautic miles.
- XVII. Visible for about 42° from about N.W. to about N. 4° W.
- XVIII. Fixed; white.
- XIX. None; fixed.
- XX. From sunset to sunrise.
- XXI. Catoptric.
- XXII. Two burners.
- XXIII. None.
- XXIV. Not known.
- XXV. By ventilating tubes.
- XXVI. None; from situation, these not requisite.
- XXVII. None.
- XXVIII. Twenty.
- XXIX. The cost of erecting this lighthouse, and at the same time raising the high tower, with keepers' houses, cost about 1,500*l.*
- XXX. All completed.
- XXXI. Lantern 7 feet diameter to glass. Height of daylight, 4 feet 8 inches. The cost has not been separately kept.
- XXXII. Built by the incorporation in 1815.
- XXXIII. About 7*l.* 10*s.* annually.
- XXXIV. Done by contract annually; average cost 7*l.* 10*s.*
- XXXV. One keeper, salary 40*l.* per annum, with free house and garden, coal and light.
- XXXVI. Not separately preserved.
- XXXVII. There are about half a dozen cylinders used annually at 5*s.* per dozen; the other items are not separately preserved.
- XXXVIII. About 80 gallons of oil, and two gross of wicks.
- XXXIX. Colza oil, price 4*s.* 3*d.* per gallon.
- XL. Best unbleached cotton wicks, 5*s.* per gross.
- XLI. None; these are not requisite.
- XLII. The lights are maintained out of the funds of the incorporation; these funds consist of the contributions of the members, rents of lands, and dues exacted from vessels entering the estuary or Firth of Tay, and are collected by parties appointed by the incorporation at the different ports and creeks in the Tay.
- XLIII. No separate account kept for this tower. See General Return, No. XV.
- XLIV. See answer No. XV. of General Return.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. By the Master and Committee of the Trinity House, Dundee, and by Messrs. Stevenson, Engineers, in 1858.
- LI. Lights inspected monthly by the Master and Committee of the Trinity House, Dundee.
- LII. No.
- LIII. Oil stored in base of tower; in tanks in upper tower; one spare burner.
- LIV. A barometer, a thermometer; there is also a time-piece.
- LV. No tide signals used; the Fraternity do not, from the position of the lights, consider that it would be prudent to indicate the depth of water over Tay bar.
- LVI. A gun and rockets are used when necessary in cases of stranding, in order to procure assistance from Carnoustie or Broughty Ferry, and to man the lifeboat.
- BUDDONESS LOWER LIGHT.—(SPECIAL RETURN.)**
- I. Buddoness Lower Light, in the parish of Barry, and county of Forfar.

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- LVII. See answer to No. XXXV.
LVIII. See copies of Rules and Regulations attached to No. XVIII. of General Return.

F III.

SOUTH FERRY LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Upper Light Tower, in the parish of Ferry-port-on-Craig, and county of Fife.
II. Fraternity of Masters and Seamen in Dundee, incorporated by Royal Charter of his Majesty George III., dated 19th September 1774. See copy of charter, which accompanies General Return.
III. James McEwen, Secretary, Trinity House, Dundee.
IV. One light looking eastward. The lights are distant apart about 1,132 feet. The Pile light is about 5,200 feet apart from the upper light tower.
V. Unknown.
VI. Unknown.
VII. Because the situation is the best for leading vessels in the best water.
VIII. About the year 1823.
IX. Built by contract. John Hamilton, builder; Robert Stevenson, of Edinburgh, Engineer.
X. River light.
XI. Stone and lime, solid, coated outside with Roman cement, and oil painted; colour white.
XII. Fitted with lightning conductor on the ordinary principle, consisting of copper bar.
XIII. Seventy-six feet. Note, base not visible from water.
XIV. Eighty feet.
XV. Nine and a half nautic miles.
XVI. Fifteen nautic miles.
XVII. Illuminates the whole channel; that is, it is seen from the water everywhere to the eastward of the lighthouse, where not intercepted by land.
XVIII. Fixed; white.
XIX. None; fixed
XX. Sunset to sunrise.
XXI. Catoptric.
XXII. Two burners.
XXIII. None.
XXIV. Not known.
XXV. Ventilating tubes.
XXVI. None required from its situation.
XXVII. Not required.
XXVIII. Nineteen.
XXIX. 900*l.*, or thereby.
XXX. All completed.
XXXI. Lantern, 7 feet 4 inches diameter to glass; height of daylight, 4 feet; cost not kept separately.
XXXII. Built by the Fraternity.
XXXIII. About 75*l.* for the last five years.
XXXIV. About 15*l.* Done by contract.
XXXV. Three keepers for this and the Pile Lighthouse, assisted by the members of their respective families. First keeper, 55*l.*; second ditto, 40*l.*; third ditto, 35*l.*, with free houses, gardens, coal, and light.
XXXVI. Not separately preserved.
XXXVII. There are about half a dozen cylinders used annually, at 5*s.* per dozen; the other items are not separately preserved.
XXXVIII. About 80 gallons of oil and 2 gross of wicks.
XXXIX. Colza oil, price, about 4*s.* 3*d.* per gallon.
XL. Best unbleached cotton wicks, 5*s.* per gross.
XLI. None; these not requisite.
XLII. The lights are maintained out of the funds of the incorporation. These funds consist of the contributions of the members, rents of lands, and dues exacted from vessels entering the estuary or Firth of Tay, and are collected by parties appointed by the incorporation at the different ports and creeks in the Tay.
XLIII. No separate account kept for this tower. See General Return, No. XV.
XLIV. See answer No. XV. of General Return.
XLV. None.
XLVI. None.
XLVII. None.
XLVIII. None.
XLIX. None.
L. By the Master and Committee of the Trinity House, and by Messrs. Stevenson, Civil Engineers, Edinburgh, in 1858.
LI. Lights inspected monthly by the Master and Committee of the Trinity House, Dundee.
LII. No.
LIII. Oil stored in base of tower, in tanks. One spare burner.

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- LIV. A barometer; a thermometer; there is also a time-piece.
LV. No tide signals used, these being quite unnecessary.
LVI. None requisite.
LVII. See answer to No. XV.
LVIII. See copies of Rules and Regulations attached to No. XVIII. of General Return.

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Circular III.

This light was visited on the 27th of July, in company with Mr. Taylor, Master of the Corporation in charge of lighthouses. It stands No. 68 on the list of lighthouses visited or seen alight.

Two reflectors of different sizes placed in the same plane were well polished, and had linen covers, but were very much scratched. There were iron chimneys, which go up to the ventilators above. The only powder used in cleaning is rouge. The cleaning leathers and other materials are kept in painted tin boxes. Three keepers have charge of two lights in use, and a third kept ready for use in case anything happens to the Pile light. Two are always at the Pile light at night and one on shore, one remains at the Pile light all day. The head keeper learned his work from the keepers at the north lights, who learned at the Bell Rock. He was a sailor, is married, has eight children. One of the assistants has three sons afloat. He is provided with a telescope. Printed regulations are suspended in the lantern. None of the meteorological instruments kept at other lights are kept here. There is a lightning conductor. There are no fog signals.

The keeper's salary is 60*l.* He has a house and garden. This lighthouse appeared to be in good order and equal to its requirements but inferior in its general fittings to the establishments under the Commissioners of Northern Lighthouses.

LOWER LIGHT, SOUTH FERRY.—(SPECIAL RETURN.)

Circular III.

- I. Lower Light Tower, in the parish of Ferry-port-on-Craig, and county of Fife.
II. Fraternity of Masters and Seamen in Dundee, incorporated by Royal Charter of His Majesty Geo. III., dated 19th September 1774. See copy of charter which accompanies General Return.
III. James McEwen, Secretary, Trinity House, Dundee.
IV. One light looking eastward; distant apart from the high tower about 1,132 feet, and about 4,068 feet from the Pile Light. The tower is 42 feet high; but since the erection of the Pile Light referred to in the Special Return No. 5, the light in this tower has been discontinued; but the apparatus is still kept in working order, so that in the event of any accident occurring to the Pile Light, this tower can be lighted on a moment's notice.
V. Not known.
VI. Not known.
VII. Same reason as in other returns.
VIII. In 1827.
IX. Built by contract. John Hamilton, builder; Robert Stevenson, engineer.
X. River light.
XI. Stone and lime, solid, coated inside and outside with Roman cement, and painted; colour white.
XII. Fitted with lightning conductor on the ordinary principle, with copper bar.
XIII. Forty-two feet. Note, base not visible from water.
XIV. Forty-five feet.
XV. Seven nautic miles.
XVI. Twelve and a half nautic miles.
XVII. Seen from the water everywhere to the eastward of lighthouse, when not intercepted by land.
XVIII. Fixed; white.
XIX. None; fixed.
XX. See answer to No. IV.
XXI. Catoptric.
XXII. One Argand.
XXIII. None.
XXIV. The late Abram Middleton, coppersmith, in Dundee.
XXV. By ventilating tubes.
XXVI. None; from situation these not requisite.
XXVII. None; light discontinued.
XXVIII. None; light discontinued.
XXIX. About 350*l.*
XXX. All finished.

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- XXXI. Lantern 7 feet 1 inch diameter to glass; 4 feet height of daylight. The cost has not been separately kept.
- XXXII. Built by the incorporation in 1827.
- XXXIII. Not in use for five years; and the rest of the questions which follow do not seem to require to be answered in consequence.

Observations by Commissioners.

This is not used. It stands 69 on the list. It was similar to the upper light in its arrangement and condition. It had but one reflector, well polished, but much scratched. It was stated that the former keeper had not been so careful as the present man.

Examined the site on which the corporation think of building a light to replace the Pile light. It would be nearer the upper light than the Pile, but considerably further than the lower light, which was extinguished because it was complained of as too near.

Circular III.

FERRY-PORT-ON-CRAIG PILE LIGHT.—(SPECIAL RETURN.)

- I. Pile Light in bed of river opposite the village of Ferry-port-on-Craig, in the county of Fife. See position laid down on chart herewith sent.
- II. Fraternity of Masters and Seamen in Dundee, incorporated by Royal Charter of His Majesty Geo. III., dated 19th September 1771. See copy of charter which accompanies General Return.
- III. James McEwen, Secretary, Trinity House, Dundee.
- IV. One light showing eastward about 5,200 feet apart from the high light on land.
- V. In 1847.
- VI. See Reports by Captain Denham, R.N., to the Lords of the Admiralty, dated 10th October 1847, and by Messrs. Stevenson, Civil Engineers, dated 26th November 1847, copies of which are herewith sent.
- VII. Recommended by Messrs. Stevenson, and approved of by the Admiralty, and by the public at large.
- VIII. In 1848.
- IX. Thomas Barker, Builder, Perth, by contract; Engineers, Messrs. Stevenson, of Edinburgh.
- X. River light.
- XI. The structure is of wood, erected on piles.
- XII. None.
- XIII. Height of tower from low water, spring tides to vane, 53 feet.
- XIV. Twenty-nine feet.
- XV. Five and three quarters nautic miles.
- XVI. Eleven nautic miles.
- XVII. Illuminates the whole channel, that is, the light is seen across the navigable channel to the eastward.
- XVIII. Fixed; white.
- XIX. Fixed.
- XX. Sunset to sunrise.
- XXI. Catoptric.
- XXII. One Argand.
- XXIII. None.
- XXIV. James Milne and Son, Brassfounders, Edinburgh.
- XXV. Ventilating tubes.
- XXVI. A bell moved by clockwork.
- XXVII. Nineteen days.
- XXVIII. Nineteen days.
- XXIX. 1,600*l.*, or thereabouts.
- XXX. All completed.
- XXXI. Lantern, 8 feet 3 inches diameter to glass; 3 feet $\frac{1}{2}$ inches height of daylight. Messrs. Milne and Son's account was 24*l.* 18*s.* 6*d.*
- XXXII. Built by the incorporation in 1848.
- XXXIII. Annual average cost of repairs about 7*l.* 10*s.*; not done by contract.
- XXXIV. Annual average cost of painting about 5*l.*; coated annually; not by contract.
- XXXV. Three keepers for this light and the light on shore, assisted by the members of their respective families. First keeper, 55*l.*; second keeper, 40*l.*; third keeper, 35*l.*, with free houses, gardens, coal, and light.
- XXXVI. Not separately kept. See answer to No. XXXI, which includes this.
- XXXVII. There are somewhere about half a dozen of cylinders used annually, at 5*s.* per dozen; the other items are not separately preserved.
- XXXVIII. About 40 gallons of oil and one gross of wicks.
- XXXIX. Colza oil, 4*s.* 3*d.* per gallon.
- XI. Best unbleached cotton wicks, 5*s.* per gross.
- XLI. About 35*l.*

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- XLIII. The lights are maintained out of the funds of the incorporation. These funds consist of the contributions of the members, rents of lands, and dues exacted from vessels entering the estuary or Firth of Tay, and are collected by parties appointed by the incorporation at the different ports and creeks in the Tay.
- XLIII. No separate account kept for this light tower. See General Return, No. XV.
- XLIV. See answer No. XV. of General Return.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. By the master and committee of the Trinity House, Dundee, and by the Messrs. Stevenson, Civil Engineers, in Edinburgh, in 1858.
- LI. Lights inspected monthly by the master and committee of the Trinity House, Dundee.
- LII. No.
- LIII. Oil stored at the lighthouse on shore, and a quantity removed to the tanks in the lighthouse as it is required; a spare lamp and burner.
- LIV. None.
- LV. No tide signals used, these being quite unnecessary.
- LVI. See copy of Regulations for Keepers of Pile Light-house, herewith sent.
- LVII. See answer to No. XXXV.
- LVIII. See copies of Rules and Regulations attached to No. XVIII. of General Return.

No. 70 on the list. Was visited the same day. It is at some distance from the shore, and was reached in a shore boat. It can always be reached except in very bad weather. It is on wooden piles, and shakes a little when it blows hard. There are night and day signals. Papers explaining them are hung in the light room with the printed regulations. There is one reflector well cleaned but much scratched, like the others. The cleaning materials are kept as in the other lighthouses. The house was well kept and clean. There is a fog bell, which was sounded and heard on board the "Vivid" at a sufficient distance to prove that it is efficient.

Trinity House, Dundee, 12th November 1841.

RULES and REGULATIONS to be observed by the KEEPERS of the TAY LIGHTS.

The principal lightkeeper shall visit both lights at least once every day, and shall note the time of such visits in his logbook, and the state of the lamps, reflectors, &c., and if he has any fault, or sees anything requiring repair, he must intimate the same to the master, or some of the Committee, with as little delay as possible. It is also to be imperative on each keeper that after he is relieved in his watch he shall, before he retires, show the other that both the lights are in good order, and that the same may be fully ascertained they must together go to each lightroom, and during their watch each must at least visit the lights once, and note the time of visit in the logbook.

The assistant lightkeeper, before leaving home, shall obtain leave of the principal keeper, and the principal keeper, if intending to leave home, shall also state the same to his assistant, so that they may not be both absent at one time; this also to be noted in the logbook, but on no account shall any of them be absent during the night. Also, should any of them (the keepers) be taken badly, it is particularly ordered that intimation, either by express or otherwise, shall be sent to the master, or, in his absence, to the deputy master, or other person in charge at the time.

By order of the Corporation,
(Signed) WILLIAM O. TAYLOR,
Master.

Trinity House, Dundee, 11th May 1855.

Night Signals to be used at the Pile Light House, River Tay.

A red and white light in two lanterns, shown horizontal, indicates that some damage has been done, or injury sustained, so that the light cannot be lighted; the light in the lower tower on shore is to be lighted immediately. Blue

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ar III. lights are to be kept burning until this is done; a light in a lantern is then to be shown seaward during the night from this lighthouse.
 A red light in a lantern, to show that the lighthouse has caught fire, and assistance is wanted.

Regulations to be observed at the South Lights, River Tay.

There must be at least always one of the keepers on the Pile Lighthouse during day; and from one hour before sunset to one hour after sunrise, there must be two keepers; each of the lightkeepers is to take a regular turn of two weeks on the Pile Light; but one of these, by regular turn, may be on shore during the day, but none of them are to leave home at any time without leave from the principal keeper; and the principal keeper, if intending to leave home, shall also state the same to the assistants; leave of absence to be noted in the logbook; but none of the keepers are on any account to absent themselves during night. It is also to be observed, that they are not to practise sailing in open boats except on special duty.

During the winter months there shall be at least one week's stock of oil, &c. on the light. Should any accident occur, or any injury be sustained, the earliest opportunity is to be taken to communicate the same to the master, deputy-master, or other person in charge at the time.

The lighthouses, reflectors, &c. are to be kept in a clean and orderly condition at all times; the apparatus in the lower tower is to be kept in readiness, so that it may be lighted at a moment's notice, in the event of an accident to the Pile. The keeper whose turn it is to be on shore shall attend to the cleaning of the shore lights; and the one stationed at the Pile shall attend to the cleaning of it; and each, as he relieves the other, must be satisfied of the clean and orderly condition of the lights when he takes charge, as no excuse will be taken, in the event of any fault being found, that they were in the same state as he got them.

The principal keeper shall always have a strict surveillance over the whole, and he is to see that everything is kept in a clean and orderly condition, and his orders to this effect are to be strictly obeyed by the assistants.

N.B.—The keeper that is longest on the Pile Light will be the one whose turn will be to be on shore during the day.

By order of the Corporation,
 (Signed) THOMAS EWING, Master.

BUOYS AND BEACONS.

- I.** The Fraternity of Masters and Seamen in Dundee, incorporated by Royal Charter of his Majesty Geo. III., dated 19th September 1774. See copy of charter which accompanies General Return.
- II.** See chart of the River Tay, herewith sent, on which is delineated the number and situation of the buoys and beacons,—there being 13 buoys and 1 beacon under the management of this authority. The cost of maintaining the buoys and beacons is not kept separate from that of the lights. See answer to General Return No. II. The charges under this authority are for maintaining lights, buoys, and beacons; the charges for these are not kept separate.
- III.** This authority not responsible to any superior authority for the proper management of buoys and beacons, except in so far as, by 6 and 7 William IV. cap 79, sec. 38, they are bound to give notice of any change intended to be made on the buoys, to the Commissioners of Northern Lighthouses.
- IV.** None.
- V.** There is herewith sent a sketch prepared by Messrs. Stevenson, Civil Engineers, Edinburgh, showing the different sizes of the Tay buoys, classified and designated according to a scale, to which reference is made. There are six different sizes; all the buoys are of wood, except No. 6, on the sketch; there are two of iron.
- a.* The "fairway buoy" being No. 1 on the chart is of wood, which is used in most instances, but there are two of iron, as already stated, which substance has become to be considered the most serviceable.
- b.* About 100*l.* for the "fairway buoy."
- c.* About 10*l.*
- d.* About 1*l.*
- e.* One.
- f.* One of each.
- g.* In the storehouses at the Trinity House, Dundee.

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- h.* A duplicate of each buoy is kept in store, with spare moorings.
- i.* One.
- j.* Heavy sea and boisterous state of the weather.
- k.* With chain and metal sinkers.
- l.* About 14*l.* each.
- m.* They are not repaired by open tender, but they are generally so procured.
- n.* By numbers and colours when seen. See chart, and copy notice to mariners relative thereto, herewith sent, dated 19th July 1858.
- o.* The whole of the buoys, 13 in number.

VI. The form and construction of the buoys are considered the best for tideways, channels, or coasts, and have been found to answer the purpose for which they are intended, and have been well thought of. See Alan Stevenson's account of Skerryvore Lighthouse, in which the Tay form of fairway buoy has been engraved.

VII. They are cleaned, painted, and repaired once a year.

VIII. The buoys are surveyed about once a month, and if found unfit, are replaced.

IX. Only one stone beacon, which is shown on the chart.

X. See above answer, No. IX.

a. Lucky-Scamp beacon.

b. September 1853.

c. To serve as a landmark.

d. A tower with a cross, being the only object of the kind in the locality.

e. Stone and lime.

f. Red.

g. Not lighted.

h. Height of tower to top of masonry 40 feet; ditto, to top of cross, 47 feet. Height from high water spring tides to top of masonry, 45 feet; ditto, to top of cross, 52 feet.

i. About 100*l.*

j. Nothing in the years specified.

k. See answers to No. XV. of General Return. No special income derived from it.

XI. See answer to No. VI.

XII. The general principle recommended by the Admiralty is that adopted in the Tay, namely, black on the port, and red on the starboard, in entering.

XIII. None.

XIV. From the general fund for the maintenance of lights, buoys, and beacons. No special collection from buoys and beacons.

XV. Same answer as No. XIV.

XVI. No separate account kept for buoys and beacons.

XVII. Application was made some years ago for a buoy on what was termed the "new shoal," near to the bar, and a buoy named "new shoal buoy" was laid down. The licensed pilots drew the attention of the Committee to the shoal. In this summer of 1858 the water had deepened on this shoal, or it had disappeared, and the buoy was therefore removed.

XVIII. Except the buoy mentioned in No. XVII., no new buoy has been laid down since 1st October 1853. The laying down and removal of that buoy was sanctioned by the authority mentioned in No. 3.

XIX. By the master and committee monthly, and by Messrs. Stevenson in 1858.

XX. Same answer as No. XIX.

XXI. By notices in the newspapers, and by handbills posted and circulated in the locality, and sent to the Custom Houses of the various ports in Great Britain and Ireland, as well as the continent.

XXII. A tender is kept by the Fraternity for the purpose, and when necessary a steam tug is employed.

XXIII. The lightkeepers and licensed pilots are instructed to report to this authority when any of the buoys are displaced.

XXIV. None.

XXV. None.

XXVI. None.

XXVII. None. These being under the immediate personal attendance of the master and committee. See General Return, No. XIX.

NOTICE TO MARINERS.—BUOYS IN THE FIRTH OF TAY.

The Corporation of the "Fraternity of Masters and Seamen in Dundee" hereby give notice, that in adopting a general system in colouring the buoys under their direction, by which arrangement vessels entering a harbour

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should keep red buoys on the starboard hand and black buoys on the port hand, while chequered buoys indicate centre dangers,—the following changes in the colours of the under-mentioned buoys in the River Tay have now been made:—

- Fairway buoy from black to red and black, horizontally, with "Tay Fairway" painted on it in white letters.
 Gaa-Sand buoys, Nos. 1, 2, 3, 4, from black and white, chequered to red, the numbers painted in black.
 Lady buoy, from black and white, chequered, to red.
 Horse-shoe buoy, from black and white, chequered to red.
 Abertay Sand buoys, Nos. 1, 2, 3, 4, 5, 6, from red to black, the figures white.
 The new shoal buoy has been removed.

By order,

GEO. WELCH, Master.

JAS. McEWEN, Secretary.

Trinity House, Dundee,
 19th July, 1858.

N.B.—A new chart, from a survey just completed by Messrs. David and Thomas Stevenson, Civil Engineers, Edinburgh, will shortly be published. Orders for copies may be addressed to the Master or Secretary.

Circular VI.

LLOYD'S EVIDENCE.

- I. David Crichton, shipowner and agent to Lloyd's, Dundee.
 II. DUNDEE and RIVER TAY.
 III. Seamen's Fraternity, Dundee.
 IV. I consider the river Tay, with the entrances and adjacent coast, to be well lighted, buoyed, and beacons.
 V. I could not suggest any improvement in the position, number, height, or colour of the buoys or beacons, nor in lights or lighthouses, except in the leading lights for the river stationed at Tayport (called the Craig Lights), as noticed in reply to query No. XVII.—I do not consider any additional lights, buoys, or beacons are required, but the removal of the Pile Light, and placing it on the land (as noticed in query XVII.) would, I think, be a great improvement, and by building the new lighthouse as far to the eastward as the nature of the land will permit, and a little to the south of the present line of direction, I am of opinion the necessity would be superseded for the floating light recommended by Capt. Denham, in his report on the lighting and buoying of the Tay, a copy of which I forward herewith.
 VII. Oil of best quality.
 VIII. I am not aware of any of the lights ever having been extinguished, or not having been duly exhibited.
 IX. I am not aware of any of the buoys having been displaced unless the buoy of the Fairway (which is very large), once or twice during heavy gales, and which has always been replaced so soon as it moderated. No accident has occurred in consequence.
 X. I have never heard of any accident fairly attributable to a want of lights, buoys, or beacons.
 XI. There are no tidal signals used in the river Tay, nor do I conceive they are required.
 XII. There are no fog signals except a bell placed on the Pile Light at Tayport, which is tolled during a fog.
 XIII. The buoys on the starboard hand entering the Tay are red, and on the port hand black; they are of a conical form.
 XIV. I could not suggest any change in the colour, form, or arrangement.
 XV. The local dues charged on the Tay Lights are 1½d. per ton on vessels with cargoes, and are paid to the Seamen's Fraternity.
 XVI. I am not aware of any complaints having been addressed to the aforesaid authority with reference to the lights, buoys, or beacons, under their control.
 XVII. I have heard the feeling expressed by several masters of ships that the leading lights at Tayport are too far apart, and that the Pile Light (which was erected a few years ago), would be better to be superseded by a light on the land close to the margin of the river, as the extended leverage makes them open out too quickly, besides which the Pile Light is in the way of ships.
 XVIII. I have never heard any complaints as to the local dues collected for supporting the lights, buoys, or beacons.

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- XIX. The local dues collected are applied by the Seamen's Fraternity to the maintenance of the lights, buoys, and beacons of the river Tay, and any excess goes to the support of their poor or decayed members.
 XX. So far as I am aware the general opinion in the locality is, that the lights, buoys, and beacons are well and efficiently managed.—20th December 1859.

I. John Spink, pilot master.

II. DUNDEE, and RIVER TAY.

III. Seamen's Fraternity.

IV. The river and entrance are well lighted and buoyed, and the coast is also well lighted.

V. I consider the buoys and lights are all placed in the best position for the navigation of the river.

VI. Answer is previously given.

VII. The lighthouses are all lighted with oil of the best quality.

VIII. The lighthouses are all properly attended, and I have never heard of any of them being extinguished.

IX. The Fairway Buoy has once or twice been moved from its position by heavy gales, but was always replaced as soon as the weather would permit, and no accident has ever occurred in consequence.

X. I have never known of any accidents from want of lights or buoys.

XI. No tide signals are used.

XII. There are no fog signals except a bell, which is placed on the Pile light at Ferry Port, and tolled in fogs.

XIII. The buoys are red on the starboard hand going in, and black on the port hand; are conical, thus ☉.

XIV. I could not suggest any improvement on the colour arrangement of the buoys.

XV. The local dues on lights is 1½d. per ton on all vessels with cargoes, and are paid to the Seamen's Fraternity.

XVI. I am not aware of any complaint having been made.

XVII. So far as I am acquainted, the general feeling of masters and mariners frequenting the port is satisfactory as to the efficiency of the light and buoys.

XVIII. I am not aware of the local dues having been complained of.

XIX. The local dues levied are applied by the Seamen's Fraternity to the up holding of the lights, buoys, and beacons, and any excess goes to the general fund for the support of their decayed members.

XX. The general opinion is that the lights and buoys of the channel are all and satisfactorily attended to by the Fraternity of Seamen.

14. ELGIN.

Harbour Company's Office, Lossiemouth,
 June 13, 1859.

SIR,

In reply to your inquiry regarding lighthouses at this place, I beg to say that the only thing in that shape here is one of Dr. Brown's lamps, used as a harbour light, and as it has not yet been a year in use it is impossible to fill up the queries correctly.

I may mention that the light was erected by the Elgin and Lossiemouth Harbour Company, by authority of the Lighthouse Commissioners, and that a small charge is made on vessels frequenting the harbour for its maintenance. No complaint has yet been made about the arrangement, on the contrary, it seems to give great satisfaction.

I shall be glad to give you any other information you may require.

Yours, &c.

J. F. Campbell, Esq.
 &c. &c.

ALEX. SIM, Collector.

LLOYD'S EVIDENCE.

Circular

- I. John Tod, Lossiemouth, Moray Firth. N.B., agent to Lloyds, Lieutenant R.N., and shipping agent.
 II. LOSSIEMOUTH, PORT OF ELGIN.
 III. Commissioners of Northern Lights, Alex. Cunningham, secretary, residing in Edinburgh.
 IV. Quite well.
 V. No improvement required at present; Covesea lighthouse always well attended.
 VI. No additional lights, buoys, or beacons required at present.
 VII. Oil.
 VIII. None.

ELGIN—FINDHORN—FRASERBURGH.

- IX. None.
- X. None.
- XI. The harbour-master shows a light by night and a flag by day, when practical for vessels to enter an harbour, as it frequently occurs that no vessel can attempt to enter the harbour at high water, on account of a heavy sea at the time.
- XII. No fog signals required, as no vessels attempt to enter the harbour without a pilot, and, when practicable to enter the harbour in a fog, the harbour-master rings a bell, and also when a fleet of herring boats are approaching in a fog.
- XIII. No buoys used at this port, there being a fine open bay, and no rocks or shoals to injure vessels on either side.
- XIV. None.
- XV. A nominal charge is made on vessels entering our harbour, to support our local harbour light.
- XVI. None whatever.
- XVII. Perfectly satisfactory.
- XVIII. Never heard any complaints, although I have been here 25 years.
- XIX. Perfectly correct.
- XX. None whatever, that I have heard.

15. FINDHORN.

BUOYS AND BEACON.

Peter Brown, Linkwood, near Elgin, Factor for Hugh Andrew Johnstone Munro, Esquire, of Novar, Proprietor of the Port and Harbour of Findhorn, begs respectfully to represent to the Honourable the Commissioners for Lights, Buoys, and Beacons, that at Findhorn there are no lights, buoys, or beacons connected with the harbour, nor ever have been; but from the intricate entrance, and in consideration of the extent of the estuary, buoys in particular are very much wanted, (while a light placed near the entrance of the harbour would prove of much service), and would be thankfully and gratefully acknowledged, were the Commissioners to order them to be placed from outside the bar to opposite the quays.

Linkwood, 18th June 1859.

PETER BROWN.

16. FRASERBURGH.

BUOYS AND BEACONS.

- I. Fraserburgh Harbour Commissioners.
- III. Not responsible, but always done.
- V.
 - a. Malleable iron.
 - b. Two buoys have been got for the channel, but not yet laid down; they are not laid down because the anchors and chains have not yet come to hand.
 - i. None then.
- X.
 - a. An iron beacon on Boich Head. A metal beacon on Cairnbulg Brigs.
 - b. Cairnbulg Brigs in the spring of 1858; Boich Head a good many years ago.
 - c. To keep vessels off the rocks.
 - d. Beacon on Boich Head has a round ball on the top; Cairnbulg Brigs is a triangular one.
 - e. None.
 - f. Cairnbulg one red, and Boich Head black.
 - g. No lights.
 - h. Boich Head about 10 feet; Cairnbulg Brigs about 20 feet.
 - i. Not known.
 - j. No cost.
 - k. None.
- XII. None but the two buoys above mentioned; not yet placed.
- XIV. Harbour funds.
- XV. Harbour funds.
- XVI. None.
- XVII. No inspection.
- XXI. Would be advertised in local newspapers.
- XXII. Harbour master.
- XXIV. No complaints.
- XXV. None.
- XXVI. None.

17. FORTH AND CLYDE.

Canal House, Glasgow,
June 6, 1859.

SIR,
In reference to your letter of the 4th, and to the blank forms of Returns as to Lighthouses, &c., I beg to state that the only two lights which the Forth and Clyde Canal Company have, are merely to guide vessels coming into their harbours at the canal entrance, for which they have no power to charge rates, and consequently it did not appear to me that the returns were applicable; but if I am wrong as to this, please let me know.

I am, &c.
J. F. Campbell, Esq. R. READMAN.
&c. &c.

BOWLING BAY LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Bowling Bay.
- IV. One light.
- VII. Light being intended to direct vessels to the entrance of the harbour, is selected as the best that could be got for that purpose.
- VIII. 1850.
- X. Harbour Light.
- XI. Wood.
- XIV. 10½ feet.
- XVIII. Fixed bright light.
- XX. Sunset to sunrise, except during June and July, when it is not lighted at all.
- XXII. One Argand burner.

CARRONMOUTH LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Carronmouth.
- IV. One light.
- VII. Placed at the extremity of the Carron River embankment, to guide vessels taking the river.
- VIII. 1st August 1847.
- IX. Canal Company's men.
- X. Chiefly harbour; partially a sea light.
- XI. Whinstone below, bricks above, covered with lead; thick single wall; limeplaster, white.
- XIII. Thirty-four feet.
- XIV. Thirty-four feet.
- XVI. Seen at Queensferry where Firth opens out, say 12 miles.
- XVIII. Fixed white light.
- XX. Sunset to sunrise.
- XXII. Six Argand oil lamps placed crescent form.
- XXIII. None.
- XXVI. Not used.
- XXXI. Three feet 7½ diameter inside.
- XXXIV. Contract, annually.
- XXXV. One, 14s. weekly.
- XXXIX. Spermaceti.
- XL. ×Circular cotton wick.
- LII. Not known to be.
- LIII. One lamp.

18. INVERKEITHING.

LIGHTHOUSE.—(SPECIAL RETURN.)

The Burgh of Inverkeithing has leading lights for taking the harbour at night.—WM. FRASER, Town Clerk.

BUOYS AND BEACONS.

The Burgh of Inverkeithing has buoys for warping ships out and into the harbour, which the magistrates keep up at the burgh's expense.—WM. FRASER, Town Clerk.

19. IRVINE.

LIGHTHOUSE.—(SPECIAL RETURN.)

There are no lights connected with Irvine Harbour.

BUOYS AND BEACONS.

- I. Trustees of Irvine Harbour, Irvine.
- This being a bar harbour there are no buoys or beacons connected with it. The river is the only guide into the harbour.

FORTH AND CLYDE. INVERKEITHING. IRVINE. Circular III.

Circular III.

Circular III.

INVERKEITHING. Circular III.

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IRVINE. Circular III.

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20. KIRKWALL.

KIRKWALL HARBOUR LIGHTHOUSE.
(SPECIAL RETURN).

- I. Kirkwall Harbour Light, Kirkwall.
 III. J. H. Baikie, Clerk to Kirkwall Harbour Trust.
 IV. One light.
 V., VI. Erected by the Harbour Trust, and solely at their expense, in 1838; and a new tower built in 1854.
 VII. Extremity of harbour.
 VIII. 1838.
 IX. John Halcro, Kirkwall, Builder; D. and T. Stevenson, Edinburgh, Engineers. Built by contract.
 X. Harbour and sea light.
 XI. Stone; solid; blue stone with freestone base and coping.
 XII. No.
 XIII. Thirty-three feet.
 XIV. Twenty feet.
 XV. About six miles.
 XVI. Ten or twelve miles.
 XVII. Fixed white light.
 XX. 1st August to 30th April; dayset to daylight.
 XXI. One.
 XXIV. Unknown.
 XXV. In top of lighthouse.
 XXVI. None.
 XXIX. About 110l.
 XXXIV. 20s. per annum.
 XXXV. Harbour master keeper.
 XXXIX. Gas, at 14s. per 1,000 feet.
 XL. About 17l. per annum.
 XLII. By Harbour Trust.
 XLIII. No charge.
 XLV. None.
 XLVIII. None.
 XLIX. None.
 L. None.
 LII. No.
 LIII. Stock of burners; Argand; always kept.
 LVI. Day signals for vessels by flag, displayed from pole on tower; no night signals.

BUOYS AND BEACONS.

- I. Kirkwall Harbour Trust, J. H. Baikie, Clerk.
 No buoys or beacons under the authority of the Harbour Trust, or within their precincts.

LLOYD'S EVIDENCE.

- I. Robert Searth, of Bin Searth, Kirkwall. Lloyd's Agent and Shipowner, and Chairmen of the Harbour Trust of Kirkwall.
 II. KIRKWALL and NORTH ISLES OF ORKNEY.
 III. Kirkwall Harbour Light under control of harbour trustees; all other buoys, beacons, and lights under control of Commissioners of Northern Lights.
 IV. I do not.
 V. The beacon upon Vasa-Skerrey is far too small, and very inefficient from this cause. The other existing lights, buoys, and beacons are excellent, and the new light on North Ronaldshay has been already the prevention of much disaster.
 VI. A buoy is much required upon the Swarf, at the entrance of Lingasound, one of our best harbours. A beacon is much required on the Galt of Shafinshay, south-west side of Strousay-Firth. A beacon upon Poldrite, or some one of the shoals at the south entrance to Enhallow Sound. A beacon upon the Skerry of Skelwick at the entrance to Pierowall Westray, all being much frequented passages. A light is much required upon Saeguoy or Saikail Head, island of Rousay, there being no outside light on the whole west seaboard of Orkney. This light would lead vessels through Westray Firth, a passage not so well known and frequented as it ought to be, and it would also enable ships to lay to with safety under the Highlands of Westray, Rousay, and the mainland in easterly gales. A light is much required on Thieve's-holme at the west end of the String, and also one upon the Moulhead, or upon Aukerry, being at the east end of the String, the entrance to Kirkwall harbour, as well as being on the east seaboard, and filling up the dangerous coast between the Pentland Skerries and the Surt Light. This last would further serve to guide to the safe refuge harbours of Deersound and Lingasound, and in running through Westray Firth.

KIRKWALL and MONTROSE.

- VII. Gas in the harbour light, oil in all the others.
 VIII. No.
 IX. No.
 X. North isles traders carrying large numbers of cattle and passengers have frequently struck upon the Galt. In 1859 the sloop "Hope" struck and filled, crew and passengers saved with difficulty. Numerous and frequent detentions, owing to want of buoys and beacons as stated, and the steamers and other trading vessels often obliged to lie off all night in the east sea, by want of a light at the entrance of the String.
 XI. None used.
 XII. None used.
 XIII. Buoys and beacons red, when to be kept on the starboard hand, and black for the reverse. Nun buoys used.
 XIV. No.
 XV. None.
 XVI. None, so far as I know.
 XVII. The general feeling is that were the buoys, beacons, and more especially the lighthouses mentioned above, in existence, the full use would be obtained by strangers as well as native coasters of the excellent outlets from the German ocean to the Atlantic, and vice versa, and of the many fine refuge harbours which exist in our north isles and mainland of Orkney.
 XVIII. They are not complained of.
 XIX. I believe they are.
 XX. I understand that all agree that the management is excellent so far as it goes.

21. MONTROSE.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Montrose.
 II. The Trustees of the Harbour of Montrose.
 III. Adam Burnes, solicitor, Montrose, clerk to said trustees.
 IV. Two river lights. Leading light for taking the harbour, 350 yards apart.
 V., VI, VII. Lights merely for local use. Lighthouses raised by subscription, and no application so far as is known made to any authority for their erection.
 VIII. About 42 years ago.
 IX. Not known.
 X. Leading lights for the harbour.
 XI. Stone and lime. One wall whitewashed.
 XII. No conductor.
 XIII. One 30; the other 60.
 XIV. The water comes to the base.
 XV. About 12 miles.
 XVI. About 9 miles.
 XVII. About 69° S.E. to E.
 XVIII. Fixed; blood red.
 XX. From sunset to sunrise.
 XXII. One each.
 XXIII. None.
 XXIV. Unknown.
 XXVI. None.
 XXVII. None.
 XXVIII. None; no register.
 XXX. About 500l.
 XXX. Finished.
 XXXI. Unknown.
 XXXII. Subscription, and purchased by the Harbour Trustees in 1839 for 500l. This sum is vested in a committee of shipowners, elected annually, for keeping up life-boat, &c.
 XXXIII. From 30s. to 40s. annually. Not by contract.
 XXXIV. Whitewashed at irregular periods, as judged necessary, at a cost of about 3l. each time.
 XXXV. One keeper; salary 50l. per annum, and free house.
 XXXVI. Not known.
 XXXVII. About 1l. for glasses, cleaning, &c.
 XXXVIII. About 120 gallons; common whale oil.
 XXXIX. Whale oil, averaging 3s. 8d. per gallon.
 XL. Round cotton wick, 1 gross; 4s. per year.
 XLI. None.
 XLII. One halfpenny per ton on all vessels entering the harbour. Collected by shore dues office.
 XLIII. In 1852, income, 30l.; 1855, 51l. Total income for 1852, 110l.

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Circular VI.

MONTROSE—MUSSELBURGH—PERTH.

- XLIV. For 1852, 117*l.* 10*s.* 5*d.* 1858, 100*l.*
- XLV. No complaint.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. No inspection made.
- LII. No.
- LIII. One spare lamp and burner.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. No relief.
- LVIII. Simply that the lights are to be kept burning from sunset to sunrise.

BUOYS AND BEACONS.

- I. The Trustees of the Harbour of Montrose, under Acts of Parliament 1837 and 1850.
- II. None existing.
- III. Not responsible.
- V. One buoy; not classed; placed on the Annat bank, mouth of River Southesk, entering to Montrose Harbour.
 - a. Wood.
 - b. 30*l.*
 - c. 3*l.* 10*s.*
 - d. It is only tarred.
 - f. One.
 - g. Kept at Montrose.
 - i. One displaced in 1858; but not since.
 - j. Stress of weather.
 - k. Stone and chain.
 - m. Not obtained by tender.
 - n. There being only one buoy, no means of identification are necessary.
- VI. No experience.
- VII. No period fixed.
- VIII. Occasional survey.
- XII. No great principle necessary; the only buoy shows the position of the Annat sand bank, immediately at the mouth of the river.
- XIV. From the general harbour revenue; no special charge made.
- XV. None.
- XVII. No application made.
- XVIII. No.
- XIX. No inspection.
- XXI. No means adopted.
- XXII. Harbour master, by whom immediate steps are taken to replace it.
- XXIII. No superior authority.
- XXV. No other buoy tried, and no suggestion as to any improvement.
- XXVI. No special rules.

22. MUSSELBURGH.

LIGHTHOUSE.—(SPECIAL RETURN.)

Fisherow Harbour, in the burgh of Musselburgh. No lighthouse.

BUOYS AND BEACONS.

- I. Thomas Lees, town clerk of Musselburgh.
- II. Copy sent. A small buoy for the guidance of the harbour pilot; no income from it. It was placed, and is kept up, without any cost to the public; no charge has ever been made in respect of it.
- X. None.
- XXVII. Nothing applicable beyond what is stated.

23. PERTH.

LIGHTHOUSE.—(SPECIAL RETURN.)

II. No lighthouse connected with this society.

BUOYS AND BEACONS.

- I. The Perth Seamen's Society.
- II. The extent of the River Tay on which the buoys and beacons are placed is about fourteen miles, begin-

PERTH.

ning two miles westward from Dundee. There are 4 placed on Balmerino Bank, a mile apart; 2 on the Middle Ground, a mile apart; 1 on Whisky Peters, 1½ mile; 1 on Bambriech, 1½ mile; 1 on Hiccham, ¾ mile; 1 on Peasweep ¼ mile; 1 on Bells Point, ¾ mile; 1 on Isle of Peat, 2½ miles; 1 on Abernethy Bank ½ mile still westward, and about 9 miles from Perth.

III. No.

IV. No.

V. Not classified.

- a. Wood and iron.
- b. Buoys, between 5*l.* and 6*l.* each.
- c. It depends on the damage it gets when it chances to go adrift, but we have not paid any particular attention to this matter, but always get them repaired when they stand in need.
- d. From 3*s.* to 5*s.* each.
- e. Thirteen.
- f. Thirteen.
- g. All kept at Newburgh, being the centre of the station of the river.
- h. Two.
- i. Six.
- j. Generally being struck by shipping, and occasionally by ice.
- k. Stone and chain.
- l. We have few or none of that depth of water, but suppose about 5*l.*
- m. Private agreement.
- n. Black on the north side and red on the southside of the river.
- o. Seven black and six red.

- VI. Nun buoys for tideways. We have no exposed channels and coasts, and have no experience in the matter.
- VII. As often as necessary, but removed twice a year, in spring and autumn.
- VIII. No special survey, but only by the superintendent of the society, who has the entire management of them.
- IX. The beacons are classified the same as the buoys, red and black.
- X. No beacons erected. The beacons answered in the foregoing question are all of wood, and moored in the same manner as the buoys.
 - a. None.
- XII. No general principle adopted, the buoys being laid down as the sandbanks change, as is generally the case in rivers.
- XIV. By halfpenny per ton on the registered tonnage of each vessel as she arrives. The fund was established by the masters and owners of ships belonging to Perth, in the year 1793, who were aware of the necessity of having buoys in the river for the safety of all vessels navigating it.

XV. The same as buoys.

XVI. Income for quarter ending 30th June 1852, 107*l.* 4*s.* 1½*d.*; income for quarter ending 30th June 1853, 131*l.* 6*s.* 6*d.* Total income for 1852, 457*l.* 1*s.* 8*d.* Total expenditure in 1852, 401*l.* 2*s.* 3*d.* Total expenditure in 1853, 427*l.* 8*s.* 11½*d.*

- XXVII. None.
- XXVIII. None.
- XXIX. By superintendent.
- XX. The same as last question.
- XXI. No notice necessary. The superintendent takes immediate steps to have them replaced.
- XXII. The superintendent, who resides at Newburgh, the central station of the river.
- XXIII. The shipmasters.
- XXIV. Never got a written complaint.
 - a. Stone and chain.
 - b. Wood and iron.
 - c. Various.
 - d. Various.
 - e. Red and black.
 - f. All branded; if not, cannot identify them.
 - g. None.
 - h. See question XIV.
 - i. None.
 - j. Collected at the Custom house with other dues.
 - m. None.
- XXV. None.

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PERTH.

PERTH and PETERHEAD.

Circular V.

XXVI. The superintendent is the only authority for the inspection and management of the buoys and beacons, as appointed by the society, and have no printed rules and regulations, or forms relating thereto.

XXVII. None.

PETERHEAD.

PETERHEAD.

for the time during which they are shown, and the building, apparatus, &c. to be kept in good order. There are no buoys or beacons under the management of the Trustees.

Peterhead Pier and Harbour lights inspected by Admiral Hamilton 28th September 1839.

South Harbour light.—Catadioptric, lit with gas, brass reflector. Gasometer and reservoir not separate from the town lights.

Alex. Machie, lightkeeper, lately appointed by the Harbour Trustees, 42 years of age. Has charge of the weighing machine, as well as all gas lights connected with the two harbours; 18 lights exclusive of the two pier lighthouses. Has to attend to all weighing at the weighing machine from 6 a.m. to 6 p.m. Intelligent, and most anxious to be instructed in the proper method of cleaning reflectors, lamps, &c.; asked me if I could give him a lesson!

Reflectors at South Harbour light very much scratched; no box for cloths or leathers, or rouge; no printed regulations or instructions; no fixed time or time table for lighting or putting out; but is guided by what he considers sunrise and sunset.

North Harbour light.—Catadioptric holophotal (vide Stevenson's "Theory and Construction of Lighthouses," page 477); lit with gas; dependent on town supply. Light, red; red colour produced by red chimney glass. Reflector in worse condition than that of the South Harbour light; no shammy leather, but makes use of a cloth, of the roughest, coarsest flannel, for cleaning both lamp and reflector; no box for cloths or powder; no table of printed instructions. No tide lights or tide signals.

24. PETERHEAD.

LIGHTHOUSE.—(SPECIAL RETURN.)

I. Peterhead; North Harbour Pierhead and South Harbour Pierhead.

II. Trustees of Peterhead Harbours.

III. Wm. Boyd, Solicitor, Peterhead, Clerk to the Trustees.

IV. One on pierhead of Western Pier, North Harbour, and other near end of Western Pier, South Harbour.

V., VI., VII. These lights have for many years been deteriorated by seafaring persons. The sites were chosen as being the best for leading lights for the harbours.

VIII. North Pier light, 10th August 1849, and South, 31st August 1849.

IX. Engineers, Messrs. D. and T. Stevenson, Edinburgh. Built by contract; the masonry by Cooper, Contractor.

X. Harbour lights.

XI. Built of granite; walls solid.

XII. No.

XIII. North harbour lighthouse, 29 feet; south harbour lighthouse, 24 feet.

XIV. North harbour light, 32 feet; south harbour light, 26 feet.

XV. North harbour light, 6 nautical miles; south harbour light, 5.4 nautical miles.

XVI. North harbour light, 12.4 nautical miles; south harbour light, 10.7 nautical miles.

XVII. North; seen from about N.E. by E. south; seen from about S. by E. $\frac{1}{2}$ S. to about S.W. by W. $\frac{1}{2}$ W.

XXVIII. South, fixed, white; and north, fixed, red.

XIX. Lights are fixed.

XX. From going away of daylight in the evening till its return in the morning.

XXI. Catadioptric Holophotal in north harbour, and Catadioptric in south.

XXII. One burner in each.

XXIII. 4th June 1849, the magnetic bearings were originally for north harbour, N.E. $\frac{1}{4}$ N. to about E. $\frac{1}{2}$ N., and south light from about S.W. by W. $\frac{1}{2}$ W. to about S.E. $\frac{1}{2}$ S.

XXIV. Messrs. Milne and Son, Edinburgh.

XXV. By apertures.

XXVI. None.

XXVII., XXVIII. No fog signals used.

XXIX. 664l. 19s. 8d., including the cost of the lantern, illuminating apparatus, &c.

XXX. Finished.

XXXI. Size of lantern, 6 feet, and 2 feet 6 inches height of daylight; price not separately known.

XXXII. It was not purchased.

XXXIII. Trifling in amount, and included in general expenditure about harbours.

XXXIV. The same answer as to No. XXXIII.

XXXV. One keeper, who has other duties.

XXXVI. Not separately known. See answer to No. XXIX.

XXXVII. Trifling. See answer to No. XXXIII.

XXXVIII. Gas is used.

XXXIX., XL., XLI. Gas is used. No fog signals in use.

XLII. From the funds belonging to the Trustees of the Harbours of Peterhead.

XLIII. No dues charged.

XLIV. See answer to Nos. XXXIII., XXXIV., XXXV., and XXXVII.

XLV., XLVI., XLVII. No dues charged nor complaints made.

XLVIII., XLIX. No complaints.

L. By the Trustees.

LII. No; the top of one of the lanterns was accidentally damaged by a vessel taking the harbour, but the light was temporarily supplied immediately until a new lantern was obtained.

LIV. None used at the lighthouses.

LV. None.

LVI. None.

LVII. The keeper is not relieved during his period of duty.

LVIII. No special rules. The lights to be kept burning

Observations by Commissioners.

Circular

LLOYD'S EVIDENCE.

I. Keith Forbes, agent for Lloyd's, Peterhead.

II. PETERHEAD and BODDAM, two miles south of that port.

III. The parliamentary trustees of the harbours of Peterhead for these harbours, and the overseer at Boddam of the Earl of Aberdeen, for that place.

IV. I do, with reference to my answer to next query.

V. The only improvements which I can suggest are as follows: (1.) To have a beacon placed on the Skairs of Cruden, seven miles south of Peterhead, a reef of rocks which lie about half a mile from the shore, covered at high water; (2), another beacon, to be placed on a sunken reef of rocks, called Scotstownhead, four miles north of Peterhead, about half a mile from the shore, and only seen at low water at spring tides; and (3), another beacon, to be placed on Rattray Briggs, eight miles north of Peterhead, a sunken reef of rocks, which lie about a mile off the shore, only seen at low water.

VI. The precise sites of the beacons are stated in the previous answer. My reasons for suggesting that beacons should be placed on those reefs were, because innumerable shipwrecks have taken place upon them, and lives lost, particularly on the two latter reefs. At the reef called Rattray Briggs there is a passage sufficient for ordinary vessels between the reef and the shore, a low sandy beach, and hence the necessity of beacons.

VII. The Buchanness lighthouse, lighted with oil, is adjacent to Boddam Harbour. During the herring season, say from middle of July to middle of October, two red lights, lighted with oil, are exhibited at Boddam Harbour, under the charge of the proprietor's overseer, the Earl of Aberdeen. Two lights, one red and the other natural, lighted with gas, are placed one at the entrance of the south harbour of Peterhead, and the other at the entrance of the north harbour, all which lights are properly attended to, and are of the utmost importance, and have been duly exhibited without any accident having occurred.

IX. There are no buoys on this coast.

X. Many losses, I have no doubt, have occurred during night in consequence of want of a lighthouse on Rattray Head, and many during daylight, in consequence of want of buoys and beacons on the reefs referred to. Some are of opinion that it would be of the first importance to have a lighthouse on Rattray Head, while others demur, but

PETERHEAD—PORT ELLEN—SALTCOATS.

all agree that beacons should be placed on the respective reefs.

- XI. There are no tide signals, either at Peterhead or Boddam. They are decidedly required at Peterhead, one at the entrance of each harbour; and I beg to suggest that flagstuffs should be erected, and that flags and balls should be exhibited to note the depth of water by which vessels can enter the harbour with safety.
- XII. There is no fog signal used at either Peterhead or Boddam, unless that, during the herring season, a six or eight pound cannon is fired during foggy weather at Peterhead while the herring fishing boats are at sea. I do not know of any better signal that could be used for the boats than the firing of the cannon, and it has been of considerable use here.
- XIII. There are neither buoys nor beacons on this coast.
- XIV. The beacons which I suggest should be coloured bright red, or some other distinctive colour.
- XV. There are no dues levied on ships in respect of lights, buoys, or beacons.
- XVI. I am not aware that any complaints have been addressed to the authorities with reference to lights, buoys, or beacons.
- XVII. I am of opinion that the general feeling of mariners frequenting Peterhead, and sailing on the coast, is that beacons, which I suggest, should be placed on the reefs.
- XVIII. There being no local dues collected, an answer is not necessary to this query.
- XIX. Ditto ditto.
- XX. I am not aware of the existence of any general opinion as to the management of lights by the authorities foresaid; my own opinion is that they are properly attended to.—23d December 1859.

25. PORT ELLEN.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Port Ellen Lighthouse, Port Ellen.
- III. John Ramsay, Port Ellen.
- VIII. 1835.
- X. Chiefly useful as a harbour light, but it is seen at sea and may guide vessels passing the coast or in the channel.
- XI. Dressed stone; a square outer wall with freestone hewn corners. The exterior is not coloured, being of the natural colour of the stone of which it was built.
- XII. There is no lightning conductor.
- XIII. Fifty-two feet.
- XVIII. An argand lamp; stationary; with the light of the natural colour.
- XX. From sunset to sunrise.
- XXIII. There has been none.
- XXIV. Smith, Edinburgh.
- XXXV. One at 20l. per annum, with free dwelling house, fuel, and cow's grass.
- XXXVII. 1857, 2l. 16s. 1858, 3l. 4s. 6d.
- XXXVIII. 1857, oil, 95 gallons; wicks, 36 dozen. 1858, oil, 70 gallons; wicks, 48 dozen.
- XXXIX. 1857, rectified oil, part cost 6s. and part 5s. 6d. per gallon. 1858, rectified oil, 5s. 6d. per gallon.
- XL. Round cotton wick in 1857, 36 dozen. Ditto in 1858, 48 dozen.
- XLII. Maintained by the proprietor.
- XLIII. None.
- XLV. There are no light dues.
- XLVIII. None.
- L. I am not aware that it was inspected.

26. SALTCOATS.

SIR,
Saltcoats, May 8th 1860.
Your favour of the 1st instant was handed to me as the oldest justice of the peace resident here. I have perused the enclosures contained therein, but as regards the harbour of Saltcoats none of the queries have any reference to

SALTCOATS, ST. DAVID'S, ST. MARGARET'S HOPE. SALTCOATS.

it, as it has not been used for many years, there being no trade at it. The proprietor of the harbour is A. W. R. Cunninghame, Esq., of Auchenharrie Seabank, Saltcoats. He, I have no doubt, will give you any other information you may require on the subject.

I remain, &c.

To J. F. Campbell, Esq.

JOHN STERRAT, J.P.

27. ST. DAVID'S.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. St. David's, Fifeshire; on the end of pier.
- II, III. Private property.
- IV. Three lights, one towards southwest (red), one south-east (white), and one north (white).
- V. In the year 1855.
- VI. William Robertson.
- VII. To guide vessels entering the harbour.
- VIII. 1855.
- IX. Thomas Cook, by daywork.
- X. Harbour light.
- XI. Single sandstone wall.
- XIII. About 20 feet.
- XIV. About 24 feet.
- XVI. About 11 miles.
- XVIII. Fixed.
- XX. When dark.
- XXI. Both.
- XXII. One.
- XXIV. Andrew Gray.
- XXV. Perforated top and bottom.
- XXVI. None.
- XXIX. About 50l., &c.
- XXXVIII. About 10l., &c., per annum.
- XXXIX. Paraffine oil, 3s. 6d. per gallon.
- XLII. Private property.
- XLIII. None.
- LI. Never.
- LV. None.
- LVI. None. Not required.

ST. DAVID'S,
Circular III.

BUOYS AND BEACONS.

- I. William Robertson, Shipping Agent, St. David's, Fifeshire, Agent to G. W. Mercer Henderson, Esq., of Fordell, Fifeshire.
- II. Four harbour buoys. No charts existing. No income derived from them. Cost of maintaining them is about 10l., &c. per annum.
- a. Wood.
- XIV. Private property.
- XXVII. The harbour where the buoys are placed is the private property of George W. M. Henderson, Esq., of Fordell, and used solely for the shipment of his own coals.

Circular V.

28. ST. MARGARET'S HOPE, ORKNEY.

St. Margaret's Hope, Orkney.

May 23d 1860.

SIR,
There being no town council in this village, the papers you sent here were handed to me, being a justice of peace for this county. After reading them over I find that they are not applicable to this locality, having neither buoys or beacons near us.

Some time ago a petition was sent from here to the Commissioners of Northern Lights, wishing them to put a buoy on Lippa, a Rock in Water Sound, and another on a rock called Skine Flaas, lying in the entrance to this bay, and a beacon on another rock or reef at the entrance to this bay, but I have not heard anything of the result.

I am, &c.

WM. CROMARTY.

J. F. Campbell, Esq.

ST. MARGARET'S HOPE, ORKNEY.

Circulars III, V.

29. STONEHAVEN.

STONEHAVEN.
STORNOWAY. SIR,
TROON.
Circulars III., V.

Stonehaven, 4th May 1860.
I HAVE received your letter of the 1st instant, addressed to the town council, Stonehaven, with printed returns to be filled up, in reference to lighthouses, buoys, and beacons, and in answer I have to state that there is no lighthouse, buoy, or beacon in this locality, or under the management of the town council or harbour trustees of Stonehaven.
I am, &c.
J. F. Campbell, Esq., Secretary.
GEO. TINDAL, Town Clerk.

30. STORNOWAY.
BUOYS AND BEACONS.

STORNOWAY.
Circular V.

I. Dan. Manro, Chamberlain of Lews, N.B.
Stornoway, 9th May 1860.—This paper being sent to the "Town Council of Stornoway," the Commission is informed that there is no magistracy in Stornoway, and hence no town council. There are no public buoys or beacons in Lews except the beacon of the lighthouse under the management of the Commissioners of Northern Lights, to whom reference is hereby made.

31. TROON.

TROON LIGHTHOUSE.—(SPECIAL RETURN.)

TROON.
Circular II!

- I. Harbour light, Troon.
- II. Captain Boland, Fullarton House, Troon.
- III. James Wood, Harbour Office, Troon.
- IV. There are two lights. Main light, at the inner end of the pier, and the other light at the pier-head, the entrance to the harbour; they bear from each other N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S., distance apart 350 yards.
- V. It is not known whether any application was ever made.
- VII. The reason the present site for the light was selected is, from its being the highest and most open to seaward, so that it can be clearly seen by vessels approaching the harbour.
- VIII. The date when the light was first exhibited is not exactly known, but is supposed to have been in 1816.
- IX. John Wilson, Engineer. Was not built by contract.
- X. Harbour light.
- XI. Built of timber to adjoining stone and lime building of three stories, and connected with iron rods and beams; painted slate colour at base, middle and top painted white.
- XII. Not fitted with lightning conductor.
- XIII. Seventeen feet.
- XIV. Thirty-seven feet.
- XV. The distance of sea horizon from light about 20 miles.
- XVI. This light is visible 10 miles distance in clear weather.
- XVII. Intermittent light. Horizontal range and magnetic bearings are as follows, viz. :—

Entrance to the Harbour of Ayr	S. 8° 26' W.
Dunure Point	S. 39° 22' W.
Ailsa Craig	S. 64° 42' W.
Lady Isle, South End	S. 73° 7' W.
Do., North End	S. 81° 34' W.
Pladda Light	S. 87° 11' W.
Lamlash Island, South End	N. 75° 56' W.
Do., North End	N. 67° 30' W.
Brodick, Island of Arran	N. 53° 26' W.
Island of Arran, North End	N. 39° 22' W.
Beacon on Horse Isle, Ardsossan	N. 19° 41' W.
Lappock Rock, near Irvine Bar	N. 14° 4 E.
Direction of Pier-head from light-house	N. 39° 22' E.

- XVIII. Intermittent bright light.
- XIX. Forty-seconds bright and twenty seconds obscured alternately.
- XX. During the night, from dusk to sunrise.
- XXI. Catoptric.
- XXII. In a circle 12 inches in diameter, containing 15 burners.
- XXIII. Lighted with gas since 20th October 1827.
- XXIV. Unknown.

TROON.

Troon
Circular

- XXV. Ventilated by a pipe 4 feet 6 inches long, with a cap at top and bottom to prevent the wind from affecting the light.
- XXVI. No fog signals.
- XXVII. None.
- XXVIII. Four days, 13th September, 25th October, and 3d and 4th November.
- XXIX. This question does not apply to this lighthouse, as the adjoining buildings are dwelling houses, bonding stores, &c. Cost of lighthouse and apparatus, 120*l*.
- XXX. Finished.
- XXXI. The dimensions of lantern or glass front through which the light is exhibited are as follows:— Diameter inside 4 feet 5 inches, glass panes 3 feet 3 inches high and 18 inches broad. Cost of ventilator and glass fittings, 15*l*.
- XXXII. Not purchased; built by the proprietor of the harbour.
- XXXIII. The average annual cost of repairs is about 4*l*.; not done by contract.
- XXXIV. The average annual cost of painting is 3*l*.
- XXXV. One lightkeeper, assisted by harbour workmen when required. Salary of lightkeeper 52*l*. per annum.
- XXXVI. Cost of whole erection and apparatus (not including houses and stores, to which it is attached), 120*l*.
- XXXVII. The cost of ordinary repairs in 1857 and 1858 was 8*l*.
- XXXVIII. Gas consumed in 1857 and 1858, about 240,000 cubic feet, or 120,000 cubic feet annually.
- XXXIX. Gas at about 8s. 4*d*. per 1,000 cubic feet.
- XL. Gas.
- XLI. None.
- XLII. The light is maintained by the proprietor of the harbour.
- XLIII. No income derived from light; it is free of charge.
- XLIV. Expenditure for 1852 and 1858, 200*l*.
- XLV. No complaints.
- XLVI. None.
- XLVII. None. No charge made for light.
- XLVIII. A spare clock or working apparatus, and set of burners are always kept ready by lightkeeper, in case of any accident occurring.
- XLIX. Barometer.
- L. No official inspection.
- LI. None.
- LII. This light, in so far as known, has never been accidentally extinguished; it is supplied with gas made in house adjoining, but in case of any accident occurring at the gaswork here pipes are laid down from the town gaswork, which could be connected with the light in two hours.
- LIII. A spare clock or working apparatus, and set of burners are always kept ready by lightkeeper, in case of any accident occurring.
- LIV. Barometer.
- LV. Tide signals are not used owing to this not being a bar harbour; a tide gauge is placed to show the state of the tide.
- LVI. No signals, such having never been required. A steam tug is kept ready night and day for attending vessels.
- LVII. Such is not required, as the gas is made chiefly during the day, and the keeper attends the light at night.
- LVIII. The person in charge of the light has special instructions to attend to it during the night, and in his absence, one of the harbour workmen attends for him.

TROON (RED LIGHT) LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Pier Light, entrance of Troon Harbour.
- II. Captain Boland, Fullarton House, Troon.
- III. James Wood, Harbour Office, Troon.
- IV. There are two lights. Red light at pier-head, and intermittent light at elbow of pier; they bear from each other S.W. $\frac{1}{2}$ S. and N.E. $\frac{1}{2}$ N.; apart, 350 yards.
- V. No application, the light having been placed immediately after the pier was completed, with the sanction of the Northern Light Commissioners.
- VII. The present site was selected from its being the end of the pier at the harbour entrance, and therefore

TROON.

- the best situation for a guiding light for vessels entering the harbour.
- VIII. 31st July 1848.
 - IX. James Wood; not built by contract.
 - X. A leading light for vessels approaching the harbour.
 - XI. Built of large freestone blocks, and solid.
 - XII. Not fitted with lightning conductor.
 - XIII. Thirty-four feet two inches.
 - XIV. Thirty-five feet.
 - XV. Sixteen miles.
 - XVI. Visible six miles distance in clear weather.
 - XVII. See return for intermittent light.
 - XVIII. Fixed, red light.
 - XX. During the night from dusk to sunrise.
 - XXI. Lighted with large gas burners, without reflectors.
 - XXII. Four burners.
 - XXIII. No alteration.
 - XXIV. Maker of lantern and lighting apparatus, John Bicket.
 - XXV. Ventilated by a funnel, with a screen at top and bottom to exclude wind and water.
 - XXVI. None.
 - XXVIII. Four days.
 - XXIX. Cost of buildings for light, 200*l*.
 - XXX. Finished.
 - XXXI. Octagon lantern, 3 feet high by 2 feet in diameter; price of lantern and fittings, 20*l*.
 - XXXII. House not required.
 - XXXIII. No repairs required by building since the light was erected.
 - XXXIV. Annual cost of painting, 2*l*.
 - XXXV. Attended to by keeper of main light and harbour workmen. Salary of lightkeeper, 52*l*. per annum.
 - XXXVI. Cost of pillar, lamp, and fittings, 55*l*.
 - XXXVII. About 1*l*.
 - XXXVIII. Gas consumed in 1857 and 1858 about 120,000 cubic feet, or 60,000 cubic feet annually.
 - XXXIX. Gas, at about 8*s*. 4*d*. per 1,000 cubic feet.
 - XL. Gas.
 - XLI. No fog signals.
 - XLII. The light is maintained by the proprietor of the harbour; no charge for light.
 - XLIII. Free.
 - XLIV. Expenditure in 1852 and 1857 about 76*l*.
 - XLV. None.
 - L. Not inspected.
 - LII. Light kept constantly burning during the night since the date of erection.
 - LIII. A spare pillar, lantern, and set of burners are kept ready. Lighted with gas.
 - LIV. Barometer.
 - LV. Tide signals not required, not being a bar harbour. A gauge is placed to show the state of the tide.
 - LVI. Signals have not been required. A steam tug is kept ready night and day to attend vessels.
 - LVII. Not required.
 - LVIII. See Return for main light.

BUOYS AND BEACONS.

- I. Captain R. S. Boland, Fullarton House, Troon.
- II. The annexed chart shows the extent of the harbour jurisdiction, and the position of the buoys. The cost of maintaining buoys in 1852 and 1858 was 16*l*. No income derived therefrom, no charges are made on vessels until within the harbour works. The number of buoys are two.
- III. No.
- IV. James Wood, Superintendent, Harbour Office, Andrew Arbuckle, Deputy Harbour Master, Harbour Office.
- V. The buoys are not classed. See accompanying chart for sketch of buoy used.
 - a. Timber.
 - b. Cost of buoy 4*l*., moorings 7*l*.
 - c. Annual cost of repairing 4*l*.
 - d. Cost of painting 1*l*.
 - e. Two.
 - f. Two.
 - g. Harbour store.
 - h. Two.
 - i. One.
 - j. A severe storm.
 - k. The buoys are moored with short link chain, made of 1½ inch iron, attached to an iron rod passing through a granite stone weighing about two tons, and fastened with a locking.
- l. 5*l*.

TROON, WICK.

- m. The buoys are procured and repaired by private arrangement.
- n. Painted red.
- o. Two.
- VI. The most approved description of buoy for tideways, &c. is, in my opinion, the iron barrel buoy.
- VII. Painted and overhauled whenever required.
- VIII. None.
- IX. None.
- XI. Cannot state as to this.
- XIV. The buoys are maintained by the proprietor of the harbour.
- XV. None.
- XVI. No income derived from buoys; expenditure for 1852 and 1858, 9*l*.
- XVII. No applications.
- XVIII. No.
- XIX. No official inspection.
- XX. No beacons.
- XXI. When a buoy is displaced, another is immediately placed.
- XXII. Yes.
- XXIII. By writing.
- XXIV. No complaints.
- XXV. No.
- XXVII. The buoys, &c. in connexion with Troon Harbour, being for the convenience of vessels trading to the harbour, are maintained solely at the expense of his Grace the Duke of Portland, the proprietor, and the superintendent has full authority to keep them in an efficient state, and the resources of the harbour are such that any damage can (as has been already stated) be made good within a few hours. From the nature and position of Troon Harbour many of the questions contained in this form are not applicable to it.

LLOYD'S EVIDENCE.

- I. John Paul, shipowner, Troon.
- II. TROON.
- III. The harbour is the property of his Grace the Duke of Portland, and the superintendent and other officials are appointed by his Grace, or representative at the harbour.
- IV. It is generally considered so.
- V. There is some difference of opinion, whether or not a light ought to be placed on the Lady Isle about 2½ miles W.S. W. of the harbour, where sometimes, although seldom, vessels get on the rocks. There are already two stone pillars or towers on the Isle.
- VII. Lighted with gas.
- VIII. I am not aware of their having been extinguished or not duly exhibited at any time.
- IX. I am not aware of any of them having been displaced.
- X. I know of none.
- XI. None used; not being a bar harbour.
- XII. None used.
- XIII. Coloured red; made of timber.
- XIV. Not competent to give an opinion.
- XV. No local dues are levied on shipping in respect of local lights or buoys.
- XVI. I am not aware that any complaints have been made.
- XVII. I never heard any complaint regarding them.
- XVIII. None enacted.
- XIX. None enacted.
- XX. I have already stated that I never heard of any complaint.

32. WICK.

PULTENEY TOWN LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Pulteney Town (Wick).
- III. Commissioners of Northern Lighthouses.
- III. Captain John Tudor, R.N., British Fishery Society's Agent.
- IV. Only one light.
- V. Provided for by Harbour Act, 1844.
- VI. Inhabitants of Wick and Pulteney Town.
- VII. As a guide to the harbour, more especially during the herring fishing season.
- VIII. 21st July 1851.

Wick.

Wick.

WICK and WHITHAM.

Wick.

Circular III.

- IX. Mr. Wilson, contractor; Messrs. Stevenson, Civil Engineers, Edinburgh.
- X. Harbour light.
- XI. Freestone, solid; belfry, painted white.
- XII. None.
- XIII. 31 feet 10 inches.
- XIV. 33 feet 5 inches.
- XV. About 10 miles.
- XVI. About 13 miles.
- XVII. From S.S.E. to E.S.E.
- XVIII. Fixed red light.
- XIX. Fixed red light.
- XX. From sunset to sunrise.
- XXI. One silvered reflector.
- XXII. One burner with 24 jets.
- XXIII. None.
- XXIV. Holophotal apparatus.
- XXV. Windows and slits in belfry.
- XXVI. Gong and gun.
- XXVII. Fifteen times.
- XXVIII. Eighteen times in harbour logbook.
- XXIX. 36*l.* Site belongs to British Fishery Society.
- XXX. Finished.
- XXXI. Lantern, 10*l.*; fittings, 12*s.*
- XXXII. Built by the British Fishery Society.
- XXXIII. None.
- XXXIV. *l.* 2*s.* Paint and oil furnished by the society; coated annually.
- XXXV. One keeper; salary, 42*l.* annually.
- XXXVI. 2*l.* 15*s.*
- XXXVII. 4*l.* 5*s.*
- XXXVIII. Only twice lighted.
- XXXIX. Sperm oil.
- XL. 1*s.*; common wick.
- XLI. Gong 9*l.* 6*s.* Gun belonging to Captain Tudor, Principal Harbour Master.
- XLII. Maintained by the British Fishery Society.
- XLIII. No charge made.
- XLIV. 119*l.* 6*s.*, which includes gaskeeper's salary, &c.
- XLV. No complaints.
- XLVI. No complaints.
- XLVII. No complaints.
- XLVIII. None.
- XLIX. None.
- L. Captain John Tudor, R.N., Principal Harbour Master.
- LI. Weekly.
- LII. Twice for want of gas; immediately supplied with oil.
- LIII. Three lamps and four burners. The oil stored in a box in the lower part of lighthouse.
- LIV. Two barometers and one hygrometer.
- LV. Lantern hoisted on flagstaff on south pier by night, and a black ball by day.
- LVI. Black balls from look-out tower by day; lantern by night.
- LVII. Only one keeper.
- LVIII. Under the superintendence of the principal harbour master.

Circular V.

BUOYS AND BEACONS.

- I. British Fishery Society for extending the fisheries and improving the sea coasts of this kingdom.
- II. South shore of the bay of Wick from the south head to the south side of bridge of Wick, including the two harbours of Pulteney Town belonging to the British Fishery Society.
- III. No buoys or beacons to manage.
- X. No other beacon, excepting the lighthouse referred to in Lighthouse Return.

BYE LAWS, RULES, and REGULATIONS to be observed by VESSELS entering the Bay, and particularly, during the Herring Fishing Season, by BOATS resorting to the HARBOUR of PULTENEY.

- I. The signals for boats entering the harbour will be as follows:—

When there is a sufficient depth of water to admit boats not drawing more than 3½ feet of water, a ball will be hoisted half-mast high from the staff on the south pier: When there is water sufficient to admit boats fully laden, the ball will be hoisted to the full height of the staff: When the bay is unsafe during the day from easterly gales or rollers, three balls at the signal tower at the south head will be hoisted; and all vessels are warned, whilst those signals are flying, to hold their offing.

II. In the event of there being too much motion at the quay heads, or the fairway being blocked up by boats or otherwise, the ball will be lowered until the entrance is cleared, and no boat shall attempt to take the harbour until the ball is again hoisted.

III. During the night a lantern will be hoisted on the south pier flagstaff when there is a sufficiency of water to admit boats, but should the bay be unsafe in consequence of rollers, a green light will be hoisted at the Salmon Rock Cliff flagstaff, warning boats or vessels to hold off the bay; should the outer part of the bay be safe, but the entrance to the harbour be unsafe or blocked up through casualty, the green light will be hoisted at the flagstaff on the south pier, and all boats or vessels are warned not to attempt to take the harbour until the green light is lowered and the white light hoisted in its place.

IV. The crews of any boats running in when the ball is not either half or wholly hoisted will be subjected in a penalty not exceeding 5*l.* for each offence, besides being liable to indemnify any party whose boat or property they may damage.

V. In foggy weather, a gong or gun from the south pier-head will indicate the entrance of the harbour.

VI. The crews of all boats shall be strictly prohibited, under a penalty not exceeding 5*l.* for each offence, from landing or taking on board nets at the jetty entrance or at the south pier; and at all times sufficient fairway at the outer entrance and up and down the harbour shall be left, and the crews of all boats coming into or leaving the harbour must use every exertion in their power to accelerate their passage, and afford room for others to follow or to pass them.

VII. All boats bringing up in the bay, either after leaving or before entering the harbour, shall be moored on either side of the bay, so as to admit of a free and clear passage or fairway of at least one hundred fathoms in breadth over the whole extent of the bay in depth.

By order of the Directors of the British Fisheries Society,
NORMAN MACLEOD OF MACLEOD,
Secretary.

HARBOUR OF PULTENEYTOWN.—NIGHT SIGNALS to be attended to, particularly during the HERRING FISHING SEASON.

During the night a lantern will be hoisted on the south pier flagstaff, when there is a sufficiency of water to admit boats; but, should the bay be unsafe in consequence of rollers, a green light will be hoisted at the Salmon Rock Cliff flagstaff, warning boats or vessels to hold off the bay. Should the outer part of the bay be safe, but the entrance to the harbour be unsafe, or blocked up through casualty, the green light will be hoisted at the flagstaff on the south pier, and all boats and vessels are warned not to attempt to take the harbour until the green light is again lowered and the white light hoisted in its place.

By order,
JOHN TUDOR, R.N., Agent, B.F.S.

Harbour Office, Pulteneytown,
June 1, 1858.

33. WHITHAM.

BUOYS AND BEACONS.

- I. The Magistrates and Council of the Royal Burgh of Whitham, N.B.
- II. No such chart in existence.
- III. None, unless the Board of Commissioners for Northern Lighthouses.

IV. None.

V. to VIII. There are no buoys belonging to the burgh.

IX. See below.

X. There is but one beacon at the isle of Whitham, situated on the "Screens Rocks," at the entrance to the harbour.

a. No particular name.

b. In July 1858.

c. To indicate the "Screens Rocks," and indicate the entrance to the harbour.

d. The pole arises 40 feet from the rock, and is surmounted by a red painted barrel, 3 feet high by 30 inches wide.

Whi

Circular

WHITHAM.

- e. Hammered iron, 5 inches diameter at bottom, and tapering to 2 inches at top.
- f. Both pole and barrel are painted red.
- g. Not lighted.
- h. About 15 feet above high-water spring tides.
- i. 99l. 18s. sterling.
- j. No separate cost in 1858 for maintenance.
- k. No separate income.
- XI. Only one beacon used. See above.
- XII. See above. No buoys.
- XIII. See above. Only one.
- XIV. No buoys.
- XV. From the common good, or revenue of the burgh of Whitham.
- XVI. Answered above.
- XVII. No formal applications made for these.
- XVIII. None.
- XIX. See above. No inspection.
- XX. No formal or official inspection made.
- XXI. By handbills and advertisements in local papers.
- XXII. No buoys.
- XXIII. See answer No. XXI. The harbour master at the isle informs the Council.
- XXIV. None.
- XXV. An iron beacon was erected on the "Screens Rocks," in autumn, 1857, according to designs furnished by the Northern Light Commissioners' engineers. It only lasted, however, till the middle of the next winter, when the very violent sea running past the Screens Rocks, carried it away, though apparently very substantial. The present beacon or pole was adopted from a statement by an American captain, of a like erection near New York, which had stood while all other forms of

WHITHAM.

- beacons had, from a like cause, been destroyed. No similar erection is known on this coast, but the principle appears by experience to be good. The beacon is, at this moment, as good as when first erected, nearly 12 months ago. There were usual violent gales last year, to which it was exposed.
- XXVI. None.
- XXVII. None.

WHITHAM
Circular V.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. James Farquharson, inspector of harbour works.
- II. Lord Fife and his trustees.
- III. John Hannay, Factor.
- IX. Messrs. Stevenson, Edinburgh; built by the day; superintended by J. Farquharson.
- X. Harbour light; house and apparatus new, but there was a light before.
- XI. Built of rubble, with dressed plinth; painted white; iron lantern.
- XIII. Eighteen feet.
- XIV. Thirty-two feet.
- XXVIII. Fixed. White from S.W. 6 S. $\frac{1}{2}$ S. to S. $\frac{1}{2}$ E. Red from S. $\frac{1}{2}$ E. to E.S.E.
- XX. From sun to sun.
- XXII. One.
- XXIII. Altered from a common gas lamp to reflecting apparatus by Messrs. Stevenson, Edinburgh, June 1859.

Circular III.

IRELAND.

1. BELFAST.

LIGHTHOUSES.—(GENERAL RETURN.)

- I. Belfast, Harbour Commissioners.
- II. Five; all channel lights.
- III. To enable vessels to enter the navigable channel or river, and afterwards navigate up to town.
- IV. Rather above a steamer's deck at high water.
- V. The entering light on Holywood Bank is dioptric, the others are lenses similar to those used in steamers.
- VI. Being of sufficient power for the distance required to be seen.
- VII. All fixed. The light entering the channel is coloured red. The others are red on starboard and green on the larboard hand in going up the river.
- VIII. After passing the entering light (which is red), they are coloured red and green, to indicate the sides of the river in going up.
- XI. Colza oil; tested by burning a portion of it.
- XII. The gong is used to distinguish the fog signal from ships' bells, but a bell of a large size is about to be erected.
- XIII. None.
- XIV. None.
- XV. No income.
- XVI. None tried.
- XVII. None.
- XVIII. None.

PRICES.

- Dioptric. HOLYWOOD BANK LIGHT. One light.
- Price - - - Fixed. Included in cost of contract. Wilkinson, London, Maker.
- Ordinary repairs - - - 1l. 10s. 8d.
- Oil - { Consumption 1 $\frac{1}{4}$ gallon.
- { Cost - - - 4s. 2d.
- Wicks - { Consumption 4 wicks.
- { Cost - - - 1d.
- Common lens. GARMOYLE LIGHT. One light.
- Price - - - Fixed. 15l. 16s.
- Ordinary repairs - - - 1l. 15s. 6d.
- Oil - { Consumption $\frac{4}{5}$ gallon.
- { Cost - - - 2s. 8d.
- Wicks - { Consumption 4 wicks.
- { Cost - - - 1d.

Common lens. SEAL CHANNEL LIGHT. One light.

- Price - - - Fixed. 15l. 16s.
- Ordinary repairs - - - 1l. 15s. 6d.
- Oil - { Consumption $\frac{3}{4}$ gallons.
- { Cost - - - 2s. 8d.
- Wicks - { Consumption 4 wicks.
- { Cost - - - 1d.

BELFAST.
Circular II

Common lens. N. END OF TWIN ISLAND LIGHT

- One light.
- Price - - - Fixed. 15l. 16s.
- Ordinary repairs - - - 1l. 15s. 6d.
- Oil - { Consumption $\frac{3}{4}$ gallon.
- { Cost - - - 2s. 8d.
- Wicks - { Consumption 4 wicks.
- { Cost - - - 1d.

Common lens. S. END OF TWIN ISLAND LIGHT.

- One light.
- Price - - - Fixed. 15l. 16s.
- Ordinary repairs - - - 1l. 15s. 6d.
- Oil - { Consumption $\frac{3}{4}$ gallon.
- { Cost - - - 2s. 8d.
- Wicks - { Consumption 4 wicks.
- { Cost - - - 1d.

GARMOYLE LIGHTHOUSE.—(SPECIAL RETURN.)

Circular III.

- I. Garmoyle; Belfast.
- II. Belfast Harbour Commissioners.
- III. Belfast Harbour Commissioners.
- IV. Only one.
- V., VI. Ordered by Commissioners in 1849. Application (if any) not recorded.
- VII. To indicate the navigable channel, and prevent vessels entering a small channel called Joy's Channel. See Map.
- VIII. December 1851.
- IX. Built by Commissioners. Geo. Smith, C.E. Not by contract.
- X. River light.
- XI. Built with timber on piles; 11 cables' length south of Holywood Bank Light. Painted stone colour.
- XII. None.
- XIII, XIV. 25' 9" from ordinary spring tides to top of roof.
- XV., XVI. Not intended as a sea light.
- XVIII. Common lens; fixed; bright green.
- XIX. None.

- BELFAST.**
Circular III. XX. Sunset to sunrise.
XXI. Common lens.
XXIII. None.
XXIV. Wilkinson, London.
XXV. Small flue over lamp.
XXVI. None.
XXVII. None.
XXVIII. None.
XXIX. Cost of lighthouse, 261*l*.
XXX. Finished.
XXXI. No lantern, a side light.
XXXII. Built by Commissioners.
XXXIII. 5*l*.; by Commissioners, not by contract.
XXXIV. 4*l*. 10*s*.; not by contract, by Commissioners.
Once a year.
XXXV. One keeper, at 10*s*. per week.
XXXVI. Cost of lens ready for use, 14*l*. 14*s*.
XXXVII. 1*l*. 15*s*. 6*d*.
XXXVIII. Oil, 72 gallons; wicks, 2 gross.
XXXIX. Colza oil, 4*s*. 10½*d*. per gallon in 1857; 4*s*. 2*d*. and 3*s*. 4*d*. per gallon in 1858.
XL. Argand wick, 6*s*.
XLI. None.
XLII. General income of port.
XLV. None.
XLVI. None.
XLVII. None.
XLVIII. None.
XLIX. None.
L. Belfast Harbour Commissioners.
LI. In August each year.
LII. No.
LIII. Two. The oil is stored in the Commissioners' premises in town, and sent to the lighthouse as required, in a two-gallon can.
LIV. None.
LV. None.
LVI. None.
LVII. Keeper is stationary in the lighthouse.
LVIII. Keeper to devote his whole time to the duties of the lighthouse.
- BELFAST.**
LI. In August in each year.
LII. No.
LIII. Two. The oil is stored in the Commissioners' premises in town, and sent to the lighthouse, as required, in a two-gallon can.
LIV. to LVI. None.
LVII. Keeper is stationary in the lighthouse.
LVIII. Keeper is to devote the whole of his time to the duties of the lighthouse.
- BELFAST.**
Circular I. HOLYWOOD LIGHTHOUSE.—(SPECIAL RETURN.)
I. Holywood Bank, Belfast.
II. Belfast Harbour Commissioners.
III. Same.
IV. Only one.
V. 21st July, 1843.
VI. Steam Packet Agents.
VII. To indicate the deepest water at the entrance of the channel up to town.
VIII. Light vessel in 1844. The present light in 1845.
IX. Mr. Mitchell, Builder. Geo. Smith, C.E.
X. Harbour light.
XI. Built of timber on screw piles, about a mile from the south side of the Lough. Painted stone colour.
XII. None.
XIII., XIV. From ordinary spring tides to vane 22' 6".
XV. 8 to 9 miles.
XVI. 10 miles.
XVII. 315 degrees. See Chart.
XVIII. Fixed. Pale red.
XIX. None.
XX. Sunset to sunrise.
XXI. Dioptric.
XXII. Third order.
XXIII. None.
XXIV. Wilkinson, London.
XXV. Small flue over light.
XXVI. Gong.
XXVII., XXVIII. 24 days.
XXIX. 1,300*l*.
XXX. Finished.
XXXI. Included in cost of erection (1,300*l*.) See XXIX.
XXXII. Built by Commissioners.
XXXIII. Average cost of repairs for five years, ending first quarter 1858, 60*l*. Not done by contract.
XXXIV. 10*l*. Not by contract. Once a year.
XXXV. The pilot master, who acts as lightkeeper, 2*l*. per week. (See LVII.)
XXXVI. Included in cost of erection (1,300*l*.) (See XXIX.)
XXXVII. 1*l*. 10*s*. 8*d*.
XXXVIII. 106 gallons of oil, 2 gross wicks.
XXXIX. Colza oil, 1857, 4*s*. 10½*d*. per gallon; 1858, 4*s*. 2*d*. and 3*s*. 4*d*.
XL. Argand wick, 3*s*. per gross; total cost 6*s*.
XLI. From 3*l*. 3*s*. to 10*l*. 10*s*.
XLII. General income of port.
XLIV. 1852, about 15*l*.; 1858, 20*l*.
XLV. to XLIX. None.
L. Belfast Harbour Commissioners.
LI. In August 1857, and in August 1858 (inspected in August each year).
LII. No.
LIII. Two. The oil is stored in the Commissioners' premises in town, and is sent to the lighthouse in a five-gallon can, as required.
LIV. None.
LV. None.
LVI. None.
LVII. The lighthouse is also a pilot station, and the pilot-master acts as lightkeeper; he is stationary.
LVIII. Keeper is to devote his whole time to the requirements of the lighthouse and pilots.
- BELFAST.**
Circular I. EAST TWIN LIGHTHOUSE.—(SPECIAL RETURN.)
I. East Twin Island, S.W. end, Belfast.
II. Belfast Harbour Commissioners.
III. Same.
IV. Only one.
V. Application not recorded.
VI. Application not recorded.
VII. To indicate the channel, and mark termination of the island.
VIII. October 1850.
IX. Harbour Commissioners. Geo. Smith, C.E. Not by contract.
- BELFAST.**
Circular III. SEAL CHANNEL LIGHTHOUSE.—(SPECIAL RETURN.)
I. Seal Channel, Belfast.
II. Belfast Harbour Commissioners.
III. Same.
IV. Only one.
V., VI. Ordered by Commissioners in 1849. Application (if any) not recorded.
VII. To indicate the navigable channel, and to prevent vessels going aground on the west side of river.
VIII. December 1851.
IX. Harbour Commissioners. Geo. Smith, C.E. Not by contract.
X. River light.
XI. Built of timber on piles, six cables' length south of Garmoyle Light on west side of navigable channel, near entrance to Seal Channel (see Map).
XII. None.
XIII., XIV. 25' 9" from ordinary spring tides to top of roof.
XV., XVI. Not intended as a sea light.
XVIII. Fixed. Bright red.
XIX. None.
XX. Sunset to sunrise.
XXI. Common lens.
XXIII. None.
XXIV. Wilkinson, London.
XXV. Small flue over the lamp.
XXVI., XXVII. None.
XXIX. Cost of lighthouse 261*l*.
XXX. Finished.
XXXI. No lantern; a side light.
XXXII. Built by Commissioners.
XXXIII. 5*l*. By Commissioners, not by contract.
XXXIV. 4*l*. 10*s*. Not by contract, by Commissioners.
Once a year.
XXXV. One keeper, at 9*s*. per week.
XXXVI. Cost of lens 14*l*. 14*s*.
XXXVII. 1*l*. 15*s*. 6*d*.
XXXVIII. Oil, 72 gallons. Wicks, 2 gross.
XXXIX. Colza oil, 1857, 4*s*. 10½*d*. per gallon; 1858, 4*s*. 2*d*. and 3*s*. 4*d*.
XL. Argand wick, 2 gross, 6*s*.
XLI. None.
XLII. General income of port.
XLV. to XLIX. None.
L. Belfast Harbour Commissioners.

BELFAST.

- XI. Wood; in form of a turret, painted stone colour; only one of this kind in use.
- XII. None.
- XIII. 19' 0" from base to top of roof.
- XIV. 17' 0".
- XV. Not a sea light, a river light.
- XVIII. Fixed; a bright green.
- XIX. None.
- XX. Sunset to sunrise.
- XXI. Common lens.
- XXIII. None.
- XXIV. Wilkinson, London.
- XXV. Small flue over lamp.
- XXVI. None.
- XXVII. None.
- XXVIII. None.
- XXX. Finished.
- XXXI. No lantern; a side light.
- XXXII. Built by Commissioners.
- XXXIII. 20s. By Commissioners. Not by contract.
- XXXIV. 20s. Not by contract. Once a year.
- XXXV. Keeper of N.E. lighthouse, attends to this one, 10s. 6d. per week.
- XXXVI. 14l. 14s.
- XXXVII. 1l. 15s. 6d.
- XXXVIII. Seventy-two gallons; wicks two gross.
- XXXIX. Colza oil, 1857, 4s. 10½d. per gallon; 1858, 4s. 2d. and 3s. 4d. per gallon.
- XL. Argand wick.
- XLI. None.
- XLII. General income of port.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. Harbour Commissioners.
- LI. In August each year.
- LII. No.
- LIII. Two; the oil is stored in the Commissioners' premises in town, and sent to the light in a two-gallon can as required.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. Keeper is stationary.
- LVIII. Keeper to devote the whole time to the duties of the lighthouses.

BELFAST.

- XXXVII. 1l. 15s. 6d.
- XXXVIII. Seventy-two gallons; wick, two gross.
- XXXIX. Colza oil, 1857, 4s. 10½d. per gallon; 1858, 4s. 2d. and 3s. 4d. per gallon.
- XL. Argand wick, two gross, 6s.
- XLI. None.
- XLII. General income of port.
- XLV. None.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. By Commissioners.
- LI. In August each year.
- LII. No.
- LIII. Two; the oil is stored in the Commissioners' premises in town, and sent to the light in a two-gallon can, as required.
- LIV. None.
- LV. None.
- LVI. None.
- LVII. Keeper is stationary.
- LVIII. Keeper to devote his whole time to the duties of the lighthouse.

BELFAST.
Circular III.

BUOYS AND BEACONS.

- I. Belfast Harbour Commissioners.
- II. Admiralty Chart, by Capt. Beechey.
- III. Is not responsible.
- IV. None.
- V.

No. 1.	No. 2.
a. Mall-iron top, cast-iron bottom.	Wood.
b. 25l.	20l.
c. 2l.	2l. 10s.
d. 3l. 10s.	2l. 15s.
e. Two.	Five.
f. One.	Two.
g. Harbour Commissioners' Yard, Belfast.	Harbour Commissioners' Yard, Belfast.
h. One.	Two.
i. One.	One.
j. Gales of wind.	
k. By stones.	
l. Cast-iron anchor and chain 31l. 10s. Stone and mooring chain, 12l. 10s.	
m. By open tender.	
n, o. None.	
- VI. The iron one, according to sketch.
- VII., VIII. Examined and painted annually.
- IX., X. There is only one.
 - a. West Bank Beacon.
 - b. 1849.
 - c. To indicate the channel of the river.
 - d. None required, there being only one.
 - e. Stone.
 - f. Black stone (trap rock), with light-coloured sand stone cap and cross.
 - g. Not lighted.
 - h. 16' 0"; to top of cross 20.
 - i. 218l.
 - j. No expenditure since 1852.
 - k. None.
- XI. One fourth iron in the place of wood.
- XII. Coloured black on the starboard side, and red on the port side, in going up the river.
- XIII. There being only one, none is required.
- XIV. Maintained from general income of port, and paid into the office of the Belfast Harbour Commissioners.
- XV. Same.
- XVI. No charge made for buoys and beacons. Expenditure in 1852, 29l. 5s. 3d.; in 1853, 41l. 3s. 10s.
- XVII. None made.
- XVIII. None.
- XIX. Belfast Harbour Commissioners inspected harbour pilots, buoys, lighthouses, beacons, &c. on the 5th August 1857 and 31st August 1858.
- XX. Same.
- XXI. Reports of pilots, &c. specially ordered to observe same.
- XXII. After report of buoy having been displaced, the harbour master makes temporary arrangements until meeting of Commissioners.
- XXIII. Reported by the harbour master at first general meeting of Commissioners after such accident.
- XXIV. None.
- XXV. None have been tried differing from the sketches.
- XXVI. None.

EAST TWIN LIGHTHOUSE.—No. 2.—(SPECIAL RETURN.)

- I. East Twin Island, N.E. end, Belfast.
- II. Belfast Harbour Commissioners.
- III. Same.
- IV. Only one.
- V. Application not recorded.
- VI. Application not recorded.
- VII. To indicate the entrance to Victoria Channel.
- VIII. October 1850.
- IX. Harbour Commissioners. Geo. Smith, C. E. Not by contract.
- X. River light.
- XI. Black stone; walls 18 inches thick; no means, there being only one of this kind.
- XII. None.
- XIII. 19' 9" from base to top of roof.
- XIV. 17' 0".
- XV. Not intended as a sea light, a river light.
- XVI. Not intended as a sea light, a river light.
- XVIII. Fixed; bright green.
- XIX. None.
- XX. Sunset to sunrise.
- XXI. Common lens.
- XXIII. None.
- XXIV. Wilkinson, London.
- XXV. Small flue over light.
- XXVI. None.
- XXVII. None.
- XXVIII. None.
- XXIX. 261l.
- XXX. Finished.
- XXXI. No lantern, a side light.
- XXXII. Built by Commissioners.
- XXXIII. 5l. By Commissioners, not by contract.
- XXXIV. 4l. 10s. Not by contract, by Commissioners. Once each year.
- XXXV. One keeper, 10s. 6d. per week.
- XXXVI. 14l. 14s.

BELFAST.

BELFAST.

Circular III.
Observations
by Commis-
sioners.

Met at the harbour office some members of the Harbour Board. They appear to be very anxious to maintain the navigation of the harbour safe and efficient.

Mr. Robert Henderson, agent for various merchant steam companies, thinks river is well lighted. The existing green and red lights ought to have been on opposite sides, but too late to change them now. The buoys are very suitable for sheltered ground. The gongs at outer lighthouse are very inefficient; should have a bell.

Mr. John Charley, also agent for four companies and Mr. John McTear, agent for four companies, agrees in above.

All agree that Copeland light should be moved to the point of Mew Island, if it can be seen from Grey Point.

The bell at the Copeland is not good; a five-minute gun would be much better. The light is moderately good.

The Steam Packet Company agents appear very much satisfied, with the management of the Harbour Board. Some of them thought a light and fog signal on Black Head (the north cape of the bay) would be useful, but admitted that it was possible to have too many lights. The North Brigg, a shoal on the north shore, should be buoyed.

Captain Hoskins, commanding Admiralty survey, recommends a bell at outer pile light; suggests that as a distinction the bell should ring rapidly for a short time, then stop.

A fog signal at Blackhead would be very useful.

Captains Charles Barry, George Brown, John Francis, all take their own vessels in and out. All agree that Copeland light should be shifted.

Captains C. Barry and Geo. Brown have never heard the bell.

Captain J. Francis has heard it sometimes. Tide runs so strong does not think buoy bell would be heard. A gun would be best.

The perch at the North Briggs should be much larger.

A fog signal at Blackhead would be useful.

Belfast is foggy, but not so much so as Clyde.

Steam Captains.—Jas. Hardie, "Leopard," Belfast packet, Leonard Humphries, "Prince Patrick," John Campbell, "The Semaphore," in favour of moving Copeland light. The island is very low. 40 to 70 feet would be high enough for the lighthouse.

Captain Hardie states a bell at Blackhead would be very useful. American steamers are reported from it.

John McCutchen, James Hill, Robert Stewart, pilots, never heard a bell at Copelands. Would like a good fog signal at the Blackhead.

Belfast Board elected by the owners of 50 tons of shipping and payers of 10*l.* police rates.

I visited the various harbour lighthouses (see description), and I passed them at night.

The buoys in this harbour are very striking. Mr. Smith, the intelligent engineer, calls them washing-tub buoys. The upper part is very slight, but shows well, and the buoys generally remain vertical, owing to form, and weight of chain.

The Harbour Commissioners, at great outlay, have very much improved the harbour, and are gradually deepening the approaches, cutting new channels, &c.

ALFRED P. RYDER.

Circular VI¹

LLOYD'S EVIDENCE.

I. Sinclair and Boyd, Donegall Quay, Belfast, general merchant agents, agents for Lloyd's, &c.

II. BELFAST.

III. Inside the port, the Harbour Commissioners; outside it, the Dublin Ballast Board.

IV. Inside the port they are; outside a fog signal is, we think, necessary on the northern coast.

V. The light on the smaller Copeland Island sits too high; the general opinion is that it would answer its purpose much better if placed on the Mew Island.

BELFAST and CARLINGFORD.

BEL

Circu

VI. We would recommend the light that at present sits on the smaller Copeland Island to be removed to Mew Island, for the reason stated in our answer to the preceding question.

VII. Colza oil.

VIII. Not aware.

IX. We have not known of any.

X. Are not aware of any.

XI. No tide signals used; nor do we consider that they are necessary within our port.

XII. A gong is used at the lighthouse on Holywood Bank, and a bell at the lighthouse on Copeland Island.

XIII. Generally red on the starboard and black on the larboard hand going up; part are iron and of pear shape, and part of wood of washing-tub shape.

XIV. We cannot say we would.

XV. None.

XVI. Not aware of any.

XVII. That the Copeland light is not so useful as it might be, because of its situation—that it would be much more serviceable if removed to Mew Island. The port and river lights are all well placed and are efficient.

XVIII. No local dues.

XX. None beyond what we have stated in reply to Query No. XVII.

2 and 3. CARLINGFORD.

CAR

FO

Circu

BUOYS AND BEACONS.

I. Leonard Watson, Lloyd's Agent, and Water Bailiff for the Right Honourable Lord Clermont, Lord of the Manor and Royalties of Carlingford Lough.

II. No chart or particular account kept of the expenses incurred by maintenance of buoys and perches in the lough. Income derived at present, 80*l.* per annum. I cannot state the income in 1852. For particulars of perches and buoys I refer to the accompanying memorandum.

III. Responsible to Lord Clermont.

IV. None.

V. Not classed.

a—o. For answer to all these queries I beg to refer to the memorandum which accompanies this.

VI. Iron nun buoys.

VII. Yearly.

VIII. No.

IX. I beg to refer to report in No. II.

X. a—f. I beg to refer to No. II.

i. Cannot say.

j. Answer to No. II.

k. Answer to No. II.

XI. Four new iron buoys are now about being placed at the entrance of the lough.

XII. I am not aware of any such. It is intended to lay down the four new buoys under the direction of a competent authority. See the general statement which is sent along with this.

XIII. None.

XIV. There is no proper fund for the maintenance of the buoys. See general statements as before.

XV. Same as buoys.

XVI. Cannot give any particulars of this.

XVII. No application.

XVIII. No application.

XIX. No application.

XX. No inspection.

XXI. By boatmen living in the neighbourhood.

XXII. Yes.

XXIII. Messenger.

XXIV. No complaints.

XXV. See answer to queries No. XI, together with memorandum of existing buoys and perches.

XXVI. No Rules or Regulations existing.

XXVII. See accompanying statement.

PERCHES AND BUOYS OVER CARLINGFORD LOUGH.

Circu

No. 1. Iron perch, on Goose Rock, west side of the channel, north-west of Blockhouse.

No. 2. Slatecock Rock, iron perch, east side of the channel, bearing north from Greenow Point.

CARLINGFORD.

- No. 3. Wooden perch, on Black Rock Castle, south side, west side of channel, between Greenow and Carlingford.
- No. 4. Wooden perch on Black Rock, west side, distant from Warrenpoint one mile.
- No. 5. Gaunaway Rock, wooden perch, east side of channel, south from Warrenpoint one mile.

BUOYS.

- No. 1. Wooden Can Buoy on Earl's Rock, east side of the channel opposite Greenow Point.
- No. 2. Red Cask Buoy (wood) on Ballyedmond Bank, dry at low water east side of the channel, Cape Leorn side, and opposite to Carlingford.
- No. 3. Small black buoy, mid channel, between Carlingford and Greenow Points.

SIR, Warrenpoint, May 31, 1859.
I BEG herewith to send you my replies to your queries respecting the buoys and beacons in Carlingford Lough.

With reference to the subject matter of these queries, I beg to inform you that up to the present time there has not been any regular system of placing or maintaining either buoys or beacons in Carlingford Lough. The royalties of the manor of Carlingford, in which are included the right to demand tolls from ships anchoring in the lough, were until lately possessed by the Marquis of Anglesey, under a patent from King James the First, and on the sale of the Carlingford estate in 1857 these royalties were purchased by the Right Honourable the Lord Clermont, under whom I hold office as water bailiff for the collection of these anchorage tolls.

The lord of the manor is not bound in any way, so far as I am aware, either to put up or maintain buoys or beacons in the lough, but Lord Clermont, being anxious to improve the navigation of the lough, and hearing from the Newry Navigation Company, to whom he applied for information, that the existing buoys were very insufficient, and having been furnished by them of a chart of the lough, in which are marked down by Mr. Hoskyns, R.N., surveyor, the positions and number of certain buoys which is considered requisite, and Lord Clermont at once ordered four large* iron nun buoys of the best description to be procured; which have just arrived here from Liverpool, and are in process of being painted preparatory to their being laid down, in which operation we hope to have the assistance and direction of Mr. Hoskyn.

I am, &c.
LEONARD WATSON.

J. F. Campbell, Esq.
&c. &c.

CARLINGFORD LOUGH.

Notice is hereby given, that iron nun buoys, 11 feet by 7, have been laid down as under, at the expense of the Right Honourable Lord Clermont, over Carlingford Lough:—

- Black.*—Buoy on the shoal N.E. of the Lighthouse in 7 feet water at low water, Lighthouse S.W., distant about 40 fathoms, Blockhouse W.N.W.
- Red.*—Buoy off the tail of the Scar, Cranfield Bay, in 8 feet water, lighthouse S.W., Greencastle north.
- Red.*—Buoy on the south end of the Earls Rock and Shoal in 8 feet water, Greenore Point W. by S., Greencastle east, distant from Greenore Point $\frac{1}{2}$ mile.
- Red.*—Buoy on the S.W. end of Ballyedmond Bank in 9 feet water, Monument north, Old Castle, Carlingford, W.S.W.
- Black.*—Buoy on the eastern edge of Carlingford Bank in 8 feet water, Greenore S.S.E., Old Castle of Carlingford S.W. by S.

The above buoys laid down at low water spring tides. Bearings per compass.

When inward bound, masters of vessels will keep the red buoys on the starboard hand, and black buoys on the port.

(By order),
LEONARD WATSON.

Warrenpoint, June 20th, 1859.

Evidence taken at Newry, March 15th, 1860.

Mr. Leonard Watson, Water Bailiff, claims for Lord Clermont, under an old charter, the right to levy an anchorage due on all vessels not belonging to

CARLINGFORD.

Newry that pass through or anchor in Carlingford Bay; the dues varying from 1*l.* on ships to 2*s.* on smacks. Does not consider that Lord Clermont is legally bound, in consideration of these dues, to buoy the shoals in Carlingford Bay; but four large buoys, two small buoys, two iron beacons, and three wooden beacons are maintained out of the dues. It appeared that Lord Clermont purchased some property in the neighbourhood, and with it this quasi right to levy anchorage dues, and farms it out to Mr Watson for 40*l.* a year. Mr. Watson states that the receipts are not more than 120*l.* a year, and that one third of that is paid to collectors. The legal right to levy this toll has been disputed.

Mr. R. Mc Craeken, steamboat agent for the Dundalk and Newry Steam Packet Company, and Mr. T. L. Carvill, merchant and shipowner, wish a light to be placed on the Black Rock; and state that Hollyhunter buoy belonging to the Ballast Board should be made a bell buoy. Considers that four more buoys should be placed in Carlingford Bay; considers the two lights belonging to the Ballast Board, viz., Hautbowline and Greenore, to be perfect. A correspondence had taken place between Mr. Carvill, on behalf of the shipping interest of Newry, requesting his lordship to improve the buoyage, which resulted in the placing of four new buoys.

Captain J. Holywood, of the "Sea Bore," 133 tons, and Captain D. Doran, of the "Merry Andrew," 62 tons, consider that Hollyhunter Buoy, outside the bar, should be larger, and have a fog bell.

- A buoy is required on a rock off Green Island.
- A larger buoy on the shoal east of Greenore light.
- A large buoy on Watson Rock.
- Do. on tail of Carlingford Bank.
- Do. on S.E. end of Bally Edmond Bank.
- Do. on edge of Killowen Bank.
- Do. where the Sear buoy is placed.
- A large perch on Perch Rock.
- A do. on Eel Rock off O'Meath Church.

ALFRED RYDER.
S. R. GRAVES.

LLOYD'S EVIDENCE.

- I. Leonard Watson, Warrenpoint, agent to Lloyd's Liverpool and Glasgow Association of Underwriters, surveyor for Lloyd's Register, agent for Austrian Lloyd's, &c. &c.
- II. CARLINGFORD LOUGH.
- III. Lord Clermont, Ravensdale Park, Flarry Bridge, County Louth, Ireland.
- IV. From my own experience, I do.
- V. No remark to make.
- VI. Present buoys, as laid down over the Lough, are sufficient for the safe navigating inwards or outwards.
- VII. Not aware of any combustible except oil used in Hautbowline light and Greenore ditto.
- VIII. I have never heard any complaints.
- IX. Buoys all well secured.
- X. I am not aware of any; a light is much wanted on the Blacklock, Dunath shore, to guide vessels to the anchorage Warrenpoint.
- XI. None used.
- XII. No signals used.
- XIII. Red buoys on the starboard hand, inward bound, and black on the port, conical.
- XIV. No change.
- XV. Anchorage dues are received by me, by authority from Lord Clermont, on all vessels except those belonging to the port or districts of Newry customs.
- XVI. There have been no complaints relative to buoys and beacons since the four iron buoys have been placed, as per inclosed notice.
- XVII. No complaints.
- XVIII. No complaints.
- XIX. Not solely collected to keep up buoys and beacons.
- XX. I am not.

CARLINGFORD.
Observations by Commissioners.

Circular VI.

* The above four large iron nun buoys have been placed as so endorsed, and inspected by Lieut. Aird, R. N., attached to Mr. Hoskyn's staff, surveying, early this month, December, 1859. I have no remarks to make on the above.

CORK.

4. CORK.

Lighthouse.—(SPECIAL RETURN.)

- I. Black Rock Castle and Barry's Point, now erecting. See chart.
- II. Cork Harbour Commissioners.
- III. Same as No. II.
- IV. See chart.
- V. Black Rock, 1822; Barry's Point, 1858.
- VI. Shipping interest.
- VII. Lights being suitable for the lighting of the river.
- VIII. Black Rock, December 1822; Barry's Point will be lighted September 1859.
- IX. Black Rock, Payne, builder; and Barry's Point, Roddy, contractor; Sir John Benton, engineer.
- X. Harbour light.
- XI. Black Rock built of white stone; Barry's Point, timber and iron. Colour, white.
- XII. None on Black Rock; Barry's Point not yet on.
- XIII. Barry's Point, 25 feet; Black Rock Castle, 84 feet.
- XIV. See No. XIII.
- XV. Not in view of sea.
- XVI. Range about 4 miles.
- XVII. Range about 4 miles.
- XVIII. Fixed lights.
- XIX. Fixed lights.
- XX. Sunset to sunrise.
- XXI. Dioptric.
- XXII. Two burners each lamp.
- XXIII. None.
- XXIV. Bennett, of Cork.
- XXV. Usual ventilation let off through the top of lantern.
- XXVI. None.
- XXVII. None.
- XXVIII. None.
- XXIX. Castle light, erected by corporation of Cork; Barry's Point, Cork Harbour Commissioners. Cost about 280*l*.
- XXXI. Black Rock, cannot answer; Barry's Point, not yet ordered.
- XXXIII. Black Rock Castle repaired by corporation.
- XXXIV. Black Rock Castle, 8*l*. per annum.
- XXXV. Salary of keeper, 40*l*. per annum.
- XXXVI. See No. XXXI.
- XXXVII. No expense to be paid.
- XXXVIII. Cost, 1857, 12*l*.; same 1858.
- XXXIX. Colza oil, 4s. 6d. per gallon.
- XL. Included, No. XXXVIII.
- XLI. None.
- XLII. From revenue of Cork Harbour Commissioners.
- XLIII. No charge made for lights.
- XLIV. 1852, 18*l*. 4s. 3d.; 1858, 12*l*.
- XLV. No answer.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. Board's engineer; no particular date; frequently.
- LI. General instructions.
- LII. No.
- LIII. Half dozen spare burners and glasses; oil in store at Black Rock Castle.
- LIV. None.
- LV. None; being a river, not required.
- LVI. None; being a river, not required.
- LVII. One keeper, resides at Black Rock Castle.
- LVIII. No precise rules; lights to be seen but to the river. The outside limits of the harbour shall be from a line between Poor Head on the east and Cork Head on the west of the harbour's mouth, with a look out from the Old Head of Kinsale to Ballycotton Island, to look out for vessels coming in.

BUOYS AND BEACONS.

- I. Act for erecting Ballast Office, and for regulating pilots, &c., &c., in Cork. Anno primo Geo. IV. cap. 52.
- II. The jurisdiction of the Cork Harbour Commissioners extends from Poor Head on the coast (for pilot purposes) and the harbour and river of Cork. No charge made to shipping for buoys or beacons.
- III. None.
- IV. There are in the harbour eight buoys under the management of the Admiralty.
- V. Conical and barrel buoys.
- a. Timber and iron.
- b. From 10*l*. to 60*l*. timber; 16*l*. iron.
- c. 5*l*. per annum, including moorings.
- e. 11 timber, 22 iron buoys.
- f. 4 timber and 2 iron buoys.

CORK.

- g. At the Harbour Commissioners' yard and premises, Cork.
- h. 4 timber and 2 iron.
- i. About 6 in number.
- j. Vessels taking the ground and making fast to haul off.
- k. A three-ton stone and heavy anchor.
- l. 30*l*.
- m. Procured and repaired at the Harbour Commissioners' yard, not by tender.
- n. By the colour; in harbour, black and white; in river, black and red.
- o. 11 black, 18 red, 4 white.
- VI. We adopt the conical iron buoys.
- VII. No fixed period, but overhauled and repaired when required.
- VIII. Same as No. VII.
- XI. See chart.
- X. Two in the harbour, one at Cork a Beg, and one on Fairs Rock.
- b. About 30 years in harbour and on river in 1858.
- c. In harbour on rocks, in river to define the channel by night.
- d. See chart.
- e. Timber on river, iron in harbour.
- f. Harbour, copper ball; river, white.
- g. Not lighted.
- h. 22 feet average.
- i. In harbour, 70*l*.; in river, 40*l*.
- j. Nothing in 1852; in 1858, 10*l*.; Fairs Rock Beacon, now under repair, 20*l*.
- k. None.
- XI. The only one renewed was that on Cork a Beg, which was iron, and replaced with one of same material.
- XII. All projecting points, rocks, and shoals requiring buoys and beacons are provided with them.
- XIII. The red buoys are on the south bank on river channel (see chart).
- XIV., XV. Funds of Harbour Board.
- XVI. No expenditure in 1852; in 1858 expended in beacons 200*l*.
- XVII. In 1857 application was made by the masters of all steamers and sailing vessels in port for the erection of beacons in the river, and ordered to be erected 23rd December 1857.
- XVIII. No application was made by the Harbour Board to any other authority.
- XIX. Board's Engineer (Sir J. Benton), at no fixed periods.
- XX. Same as No. XIX.
- XXI. Restored to its place at once.
- XXII. Information is received immediately from the dredging staff employed on the river, and at once attended to.
- XXIII. See XXII.
- XXIV. A general answer may be given; no formal complaint made; no charge or complaint of delay. The buoys are of the usual barrel and conical shape, except one lately placed to define the Bar Rock. This buoy is of an egg shape, with the ends flat; its proportions are 14 feet long and 8 feet diameter, and 3 feet at the ends.
- m. No delay.
- No dues exacted nor charge of any description made.
- XXVI. No printed rules, the buoys and beacons being under the care of the engineer.

Thursday, 22nd.—Arrived at Queenstown by boat from Roches Tower. Inspected buoys on our passage. Met Captain O'Brien, the harbour master; he informed us that the buoys in the outer part of the harbour and the entrance which belong to the Admiralty, are complained of by the ships and pilots as not being properly marked, nor of sufficient size. The Harbour Rock, at the entrance of the harbour, now marked by two buoys, should only have one, which might with advantage be a bell buoy. The Turbot Bank should have larger buoys, which should be differently painted; and the Admiralty buoys generally should be painted so as to agree in system with the buoys up the river,—viz. black on starboard side going up, and red on port. The river is well buoyed.

The Lights.—The light on Roches Point (see description of it) was, he said, very much complained of, as being only visible at a short distance, 6 to 8 miles

Observed by Com. Sion.

CORK. Circular

Circular V.

CORK.

in fine weather. The necessity of its being red to seaward was admitted. Captain O'Brien stated that he had tried some experiment tending to prove that orange was a better colour than red. We met at Captain O'Brien's office eight pilots, Jno. Murphy, Thos. Ahelian, John Morgan, Thos. Saunders, Edw. Smith, Jas. Kirby, Jno. Kavannah, and Pat. Wayling. They all agreed in the above statement, particularly respecting the indistinctness of the coloured portion of Roches Point light; and they required a fog bell at entrance of the harbour either on buoy or light-house, but preferred lighthouse. Would like to see Roches Tower raised; it acts as a beacon on the otherwise unmarked land in the neighbourhood of Cork Harbour. It was remarked that Daunt's buoy was now too small, and did not show so well as the large buoy that broke adrift.

A light placed in the vicinity of Mr. Frenche's house, east of Queenstown, would be a benefit, as it would lead the ships up to abreast the Spit light in the deep-water channel. The Spit light, they stated, is to be improved, to distinguish it better from the gas lights behind it and from ships at anchor. The pilots considered no further beacons or buoys required between Ballycotton and Cape Clear.

General.—The light at Old Kinsale Head thought to be very good, also Ballycotton.

Youghal Harbour light much brighter than Cork entrance light.

Would like a light on Galleyhead.

Stated Old Head lights always out for two or three minutes punctually at 12 o'clock (midnight) to trin.

Captain O'Brien's information about harbours to the westward:—

Kinsale Harbour, good, requires buoying; there are no buoys at present.

Glendore Harbour, beacons, but wants buoying.

Castle Townsend, wants buoying and seamarks.

Long Island, sheltered and good anchorage, wants buoying.

Crookhaven, complete.

Beahaven, very safe, wants buoying.

Kenmare, good anchorage, wants buoying, and beaconing; Admiralty beacons are lying along the beach, never having been erected.

Valentia, good harbour wants buoying.

Ventry Harbour, wants buoying.

Dingle, wants buoying.

Tralee Harbour, wants buoying.

Met at Cork Custom House.—Captain Clark, harbour master, considers Kinsale Harbour very much neglected; buoys much wanted. Has been 56 voyages to Canada. The St. Lawrence now well lit; fog signal guns are much used and valued in the St. Lawrence.

Mr. Glover, secretary to Cork Steamship Company, Mr. Foley, shipping agent, Mr. Pim, ship-owner, Mr. Brown, shipbuilder, Captain Byrnes, captain of steamer to Liverpool, Captain Holland, "Bittern," of London, think Roches Tower of advantage as a beacon.

Fog signal at harbour's mouth much wanted. It should be on shore, as if on buoy would not ring in fog. Prefer a gun.

Roches Point—harbour light worst in kingdom; has seen it six miles in fine weather, in hazy weather only quarter of a mile.

Thinks Harbour Rock should have one buoy only instead of two.

Regulations much wanted to keep channel clear of ships, and to oblige ships to exhibit lights at anchor; only two-thirds exhibit at present.

Spit light sufficiently brilliant for persons well acquainted.

A buoy wanted on White Point Bank.

General.—Condemned bell of Liverpool as never ringing, and buoy generally as not so visible as previous buoy; prefers broad-based buoys to high buoys. Considers Liverpool lights good. Recom-

CORK.

mends showing a light on Ormes' Head. Thinks a change necessary in Black Water Ship. The two lights not sufficiently distinct. Recommends uniform system of buoying over kingdom as most valuable. Considers black and red best colours.

Visited Admiral Talbot, Commander-in-Chief, who is in favour of the changes suggested; confirmed by his personal experience the insufficiency of Spit and Roches point light.

Proceeded up the river with Captain O'Brien. The river appeared to be very deep, and to require no buoys for some distance. At the narrow part of the river, commencing about five miles south of Cork, and which is gradually being deepened by incessant dredging, buoys red and black are placed, with wooden beacons close to them. The buoys appear to be very efficient. The beacons, as to their visibility in dark nights, have not answered the expectations formed of them. A small pile lighthouse (Loch Mahon light) has also been erected, and its lamp, when properly fitted, will throw a good light up and down. Suggested a small lighthouse on shore near Ardmore House, which, when kept in one with Loch Mahon light, would lead up and down the channel. A light in King's Quay, near Cork, will probably be lit as soon as the gas pipes are laid there, and will complete the lighting of the river.

The Harbour Commissioners have four spare buoys, two black and two red, ready to replace the others. Great attention appears to be paid to the buoying and lighting of the river.

Had an interview at Cork with Sir John Benson, the engineer to the Harbour Board, who showed every desire to attend to suggestions for improving the lighting, buoying, &c.

A. P. RYDER.
S. R. GRAVES.

LLOYD'S EVIDENCE.

- I. N. and J. Cummins and Brothers, Lloyd's Agents.
- II. CORK and QUEENSTOWN.
- III. Harbour master.
- IV. A light placed on the lands of Cuskenny would be at much service to vessels entering harbours of night.
- VI. Cuskenny, as a land mark to steer by in a line with buoyed.
- VII. Oil.
- X. Steam vessels have constantly got on them at night.
- XIII. Black and red, all one shape; black on starboard, red on port.
- XV. Light dues are levied and paid to harbour board.
- XVI. We know of none.
- XVII. Have not heard any opinion expressed, excepting that the harbour light is considered dim from seaward.
- XVIII. Some think they ought not be obliged to pay up-channel lights before they make use of them.
- XIX. Do not know.
- XX. No.

CORK.

Observations by Commissioners.

- I. Stephen Sayer Mowle, Master, steam ship "Cormorant."
- II. CORK.
- III. Harbour master.
- IV. Yes.
- V. I consider the buoys in the river should be conical, black or starboard hand, and red cans on port, and larger size. The present ones being all cans, and too small.
- VI. Nil.
- VII. Nil.
- VIII. Nil.
- IX. No.
- X. Have often got on shore at night, in consequence of not being able to distinguish black from red.
- XI. Nil.
- XII. Nil.
- XIII. Black and red, and all one shape. Red on port; black on starboard.
- XIV. Cans on port, and conical on starboard.
- XV. Cannot say.
- XVI. Cannot tell.

Circular VI.

Circular VI.

CORK. CORK—DONEGAL—DROGHEDA.

- XVII. Cannot tell.
 XVIII. Cannot tell.
 XIX. Cannot tell.
 XX. Cannot tell.

DONEGAL.

Circular VI.

5. DONEGAL.

LLOYD'S EVIDENCE.

- I. Thomas Hughes, harbour master and ship broker.
 II. DONEGAL.
 III. Lord Arran, London.
 IV. Not buoyed at all; no beacon whatever.
 V. I put an iron perch on Dooran rock 30 years ago, it is all but gone; a light would be most useful on this rock as this is the only harbour between the point of Mullockmore, but a beacon would answer in daylight. There should also be a large buoy on the sand bank abreast of Dooran rock, and a buoy abreast of the quay of the building on the south side; also a buoy on the Privateer bank on the west side, these would conduct a ship into the anchorage in the Haasens in six fathoms water, one outer buoy on a bank inside Green Island, and guide her into the best anchorage inside Green Island. No harbour so much neglected in Ireland as Donegal, and no place more easily improved, in fact this is the only place in this deep and dangerous bay that a man could save life or property. I have had the command of ships for 30 years out of Donegal.
 IX. Many accidents have occurred for want of the above.
 X. Every accident that has occurred was for want of the above guides.
 XI. Not wanted, as we have 21 feet water round the rock at low springs.
 XII. I think there is none required.
 XIII. None of any kind.
 XIV. Put them on of any colour.
 XV. Vessels generally pay 1s. to a man who lights fires about the quay.
 XVI. Every ship master and ship owner complains of the total want of buoys, beacons, &c.
 XVII. Not a good opinion, and no wonder.
 XVIII. No dues collected but the shilling I have mentioned.
 XIX. No doubt they are.
 XX. I think the lights are well kept.

DROGHEDA.

Circular V.

6. DROGHEDA.

BUOYS AND BEACONS.

- I. The Drogheda Harbour Commissioners.
 II. There is only one buoy under the management of the above authority, which is placed at the entrance or mouth of the river. There are 12 stone beacons on the north side, and 7 stone beacons on the south side of the river, with various small wooden perches on either side, interspersed between said beacons.
 V.
 a. Iron.
 c. One.
 f. One.
 j. Storm.
 k. Chained.
 n. The buoy is painted red.
 o. One.
 XIV. Harbour dues, Custom House.
 XXI. Printed notices are immediately forwarded to the Ballast Board, Dublin, and the different other ports along the coast.
 XXII. Yes.
 XXIII. The harbour engineer notifies same.

Visited March 17th.

The channel of the river is well marked by 19 stone beacons. The river has been much deepened. Debt, 12,000*l.*; revenue, 3,000*l.*

Mr. Jame Morgan, Harbour Master.

The lights at the entrance are the property of the Ballast Board. They are three in number, and are said to be very efficient. They are on piles so as to be moveable when the bar shifts, which has not been the case lately. The two outer lights are, when in one, a leading mark for the entrance of the river; on arriving at the entrance a red light shows, and vessels

DROGHEDA and DUBLIN.

steer towards it up the river. Never heard any complaints of lights, of ball board, or of beacons which belong to the Drogheda Harbour Board.

Captain Edward Toker, of the "Leinster Lass," a steamer trading to Liverpool, and Captain Philip Hoany, "St. Patrick" steamer:—

(1.) Consider that the two outer lights are too nearly the same height;

(2.) Consider that the red light, owing to the breadth of the beam, is not a sufficient good mark for keeping up the river. A tower to carry a fourth light is built, the light of which when in one with the third light was intended to be a leading mark up the river, but, although quite ready for lighting, has never been lit. For want of this fourth light the entrance is dangerous in bad weather with a fair wind and sea. Knows no reason why it has never been lit, unless it is that the fourth tower has been placed much too near to the third tower.

Note.—The third and fourth towers were visited by me, they are very close. The keeper knew of no reason why No. 4 had never been lit. The lights are very good.

There is only one buoy off the end of the north wall, which would be much more useful if fitted with a fog bell.

The two perches, one on each side of the entrance, are too much alike.

Captain John Rodham, Dolphin schooner, 68 tons, from Workington, Cumberland, takes a pilot. considers lights and buoys sufficient.

The harbour charge is 6*d.* a ton. None of the witnesses had any complaints to make of the charge.

Matthew Owens, James Owens, Thomas Owens, pilots, think fourth tower should be lit, and the inner light of the outer couple should be raised. One of them thinks a tide light would be useful to many vessels.

ALFRED P. RYDER.

LLOYD'S EVIDENCE.

- I. James Morgan, Harbour Master, Drogheda.
 II. DROGHEDA.
 III. The Drogheda Harbour Commissioners.
 IV. I do.
 V. I cannot.
 VI. I cannot.
 VII. Oil.
 VIII. They were not.
 IX. A buoy placed on the end of the north parallel wall washed away by strong easterly gales, not replaced for a few days; one sloop lost during the interval, crew saved; the buoy is now replaced by a wooden perch, with cage on the top of it.
 X. No accident occurred except the above.
 XI. No tide signals used, nor any required.
 XII. No, but a fog bell very requisite on one of the perches at the mouth of the river.
 XIII. Black round stone pillars and wooden perches.
 XIV. No.
 XV. Yes, 7*d.* per ton paid to Ballast Board, Dublin.
 XVI. No complaints made.
 XVII. The general opinion is they are sufficient.
 XVIII. The general opinion is the charges are reasonable.
 XIX. They are.
 XX. There is not.

7. DUBLIN.

LIGHTS.—Captain O. Byrne, of "Herald" steamer, observed and pilot J. S. Keams agree in above.

Captain Higginson approves of all the lights on the east coast; thinks lower Blackwater light might be raised.

General agreement that the bell at Howth is very indifferent, and some think Kingston bell best of the two. They approve of the South Stack gun, and prefer it much as a fog signal.

Captain Johns has seen lower light at South Stack when upper invisible.

Observations by Commissioners.

DUBLIN and DUNDALK.

General.—Four captains, including Captains Byrne of "Herald," Johns of "Birmingham," Ward, of "Vanguard," think Lamlash Harbour should be lighted, and Gammels Point in Clyde; and there should be a light on Codlin Bank; a small light on Lougher's Point, Isle of Man; a light on Grey Point, Belfast, and light at North Rock made brighter. Bidston light is good; Formby light (a light vessel) blinks in bad weather.

There is a general opinion that Dublin is much less well lighted than Londonderry or Belfast.

Buoys.—General opinion that all river buoys should be larger. Perches on one side at Dublin and buoys the other would be satisfactory. The two bar buoys should be much larger, and one of them should be a bell buoy. The white buoy should be larger.

General.—Captain Higginson and Captain Johns think all the buoys on the banks on the east coast of Ireland, should be larger and more frequent. There should be a bell buoy off the south end of Kish, and a large bell buoy off South Rock, and one off Bahama Bank, Isle of Man. A master of a sailing vessel expressed a wish for a buoy off Rosebeg Bank in Dublin Bay. Captains Craig, Bell, and Robinson, think a buoy should be placed on Lamlash Rock.

General opinion in favour of a uniform system of buoyage.

A buoy on rock in Ackle Sound with a ring for warping.

It was remarked that the buoys on the Kish Bank are not so easily seen or distinguished from one another, owing to their colour.

Our notice was directed to a buoy below Poulbeg Mountain by the Ballast Board, while the next buoy outside of it is maintained by the Harbour Board.

BEACONS.—No want of beacons in Dublin Bay.

General.—Captains Craig, Bell, and Torrens, consider the reef beacon at North end of Lambay very inefficient.

Ruins Rock, between Ireland's Eye and Howth, wants a beacon.

Beacon on Taylor's Reef, at Laggan Rock, Loch Ryan, Wigtonshire should be larger.

Beacon at Brest Rock inside Ailsea Craig too small.

FOG SIGNALS.—Bell at Howth very bad, scarcely ever heard. The gun at Kingston Pier intended for fog signal has no ammunition. Captain Boyd, R.N., of coast guard ship "Ajax," fires six guns in fogs when packet expected. General opinion that a gun fired on board the "Kish" would be very useful, and that it could not be mistaken for the South Stack gun; but guns have, of course, this objection, that they may be mistaken for distress signals. Captain Johns thinks gun at Holyhead too high, and that it ought to be at South Stack. It was remarked by the superintendent of buoys, &c. that gongs were cracked by frost. Captain Boyd thought there should be a lightvessel on the South Kish.

ALFRED P. RYDER.
S. R. GRAVES.

S. DUNDALK.

LIGHTHOUSE.—(SPECIAL RETURN.)

I. The lighthouse was erected by, and is under the sole control of the Ballast Board of Dublin, who can supply the information required.

BUOYS AND BEACONS.

- I. John Lawless, Harbour Master, Dundalk.
- II. The red line on chart, sent herewith, shows extent of jurisdiction. The three buoys are coloured red, and the two beacons are shown in their proper places.
- III. The Dundalk Harbour Commissioners.
- IV. None.

- a. Iron.
- b. From 30l. to 40l.
- c. Repairs being rarely required, no account was kept.

DUNDALK.

- d. About 50s.
- e. Three.
- f. One.
- g. Harbour Works, Dundalk.
- h. One.
- i. One.
- j. Storm.
- k. Chain and large stones.
- l. About 10l.
- m. Open tender.
- n. Difference of size and shape.
- o. Three.
- VI. Cannot say.
- VII. Two years.
- VIII. Examined every year.
- IX. They are not classified.
- X. Two Beacons.
 - a. Ballymaseaulon, and the Rock.
 - b. 1859.
 - c. Marking the river channel.
 - d. Form and colour.
 - e. Timber and iron.
 - f. Red.
 - g. Only lighted when the steamers come in or go out at night.
 - h. About 15 feet.
 - i. 50l. each.
 - j. There were no beacons at that time, single poles being used instead.
 - k. None.
- XI. Three buoys and two beacons.
- XII. The buoys are so placed as to lead vessels over the bar in best water; the beacons to mark the channel.
- XIV. Dues on shipping; Harbour office.
- XV. Same.
- XVI. None.
- XVII. None.
- XVIII. None was made.
- XIX. By me. Cannot say dates.
- XX. Same.
- XXI. Information is generally given by the pilots.
- XXII. Yes.
- XXIII. None, as there is no necessity.
- XXIV. No complaints were made nor representation received.
- XXV. Last year a buoy was made shaped like a balloon with a heavy weight at the lower end or neck, 7 feet diameter at the largest part and 11 feet high. It has not been tried yet.
- XXVI. None exist.
- XXVII. Nil.

RATES OF THE MOORING BUOYS.

	£	s.	d.
For every vessel not exceeding 50 tons per register	0	2	6
Do. exceeding 50 tons, under 70 tons register	0	5	0
Do. " 70 tons, under 90 "	-	0	7 6
Do. " 90 tons, under 100 "	-	0	10 0
Do. " 110 tons, under 130 "	-	0	12 6
Do. " 130 tons, under 150 "	-	0	15 0
Do. " 150 tons, under 200 "	-	0	17 6
Do. " 200 tons, under 300 "	-	1	0 0
Do. " 300 tons, under 400 "	-	1	2 6
Do. " 400 tons, under 500 "	-	1	5 0
Do. " 500 tons, under 600 "	-	1	7 6
Do. " 600 tons, under 700 "	-	1	10 0
Do. " exceeding 700 "	-	2	0 0

EVIDENCE taken at the CUSTOM HOUSE, DUNDALK
17th March, 1850.

Observations
by Commis-
sioners, and
Evidence.

THOMAS JAMES POOLER.—Is secretary to the Dundalk Harbour Improvement Commissioners comprising sixteen members; the lord of the manor is ex officio a member, and when present presides at their meetings; the other fifteen members are elected triennially by shipowners and merchants, five going out of office annually who are eligible for re-election.

The Commissioners publish annual accounts, and their meetings are public; their jurisdiction is bounded by a straight line drawn from Coolay Point to Dunally, and their income is applicable solely for the purposes of the harbour so bounded.

Their income is derived from tonnage dues on shipping, of 6d. per ton for each of the first twenty voyages in the year, and 4½d. per ton for every voyage in the year after the first twenty voyages; and from town dues on cargoes inwards and outwards.

They have raised in debentures for harbour improvements 22,150l., of which 1,000l. is at four per cent. interest.

DUNDALK.
—
Observations
by Commis-
sioners, and
Evidence.

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and 21,500. is at five per cent. interest. The Commissioners had frequently received complaints of the want of a buoy on the Castle Rocks, and in consequence made application to the Ballast Board; and in about a year afterwards the Ballast Board put buoys on the Castle Rocks and on the Imogene Rocks, both outside the jurisdiction of the Commissioners. These were put there about two years since.

RICHARD NEEDHAM, C.E.—Is engineer to the Dundalk Harbour Improvement Commissioners.

There are at present three buoys laid down, and one spare buoy; and at present there are two timber beacons and eight timber perches which have temporary lanterns; but he is now engaged in substituting beacons for the perches.

On each of the beacons a permanent lantern will be fixed, which will be lighted when required for steamers, *i.e.*, about four nights every week. At present there are two such lights, the lighting of which costs about 180*l.* to 200*l.* per annum. To keep them lighted constantly the cost would be about double.

Considers the Pile light answers well, and that the buoys outside are sufficiently large.

The Commissioners generally accede to his proposals or suggestions. Dredging is continually going on, and further improvements are contemplated for giving greater scour and preventing the mud from falling in the river. They can now bring up ships drawing 16 to 17 feet water. The largest ship that has been brought up was 380 tons.

The Commissioners made application to the Ballast Board to put up a fog bell on the Pile light; the board objected to do so, but offered to put one up at the expense of the Commissioners. The Commissioners agreed to pay the expense, about 220*l.* The men employed by the Ballast Board in the lighthouse to attend to ringing it. That was about six months since; the bell is not yet put up.

CAPTAIN LAWLESS.—Is harbour master and captain of a tug-boat, the property of the Commissioners. Masters of vessels generally express themselves satisfied with the buoyage, &c. of the harbour. He inspects the river three times a year. About two years ago the bar buoy broke its moorings, and was six days off its station, owing to severity of weather.

He thinks if the beacons and perches were constantly lighted it would be a great convenience to sailing vessels. Coasters now follow the steamers up and down to get the benefit of the lights, and he considers a permanent light on the rock beacon much required.

WILLIAM M^r MASTER.—Is agent for the Dundalk Steam Packet Company, and thinks that when the improvements now in progress are completed, the river will be sufficiently marked. The Commissioners take much interest in the improvement of the harbour, and show much readiness to meet the increasing requirements of the port. He considers the expenditure of the Commissioners is applied to legitimate purposes, and is perhaps not greater than the port requires, though the dues are heavier than at other ports.

CAPTAIN O'NEILL.—Is commander of the steamer "Enterprise." He thinks the Imogene buoy ought to be placed a mile further south. Considers the buoys sufficient in number and size. The Pile light is good. Finds the lighting of the perches a great improvement; if they were continually kept lighted it would be a great benefit to sailing vessels. Complains of the outside perch not being always lighted. In very bad weather it is not lit. His vessel got aground lately through his supposing the second light was the outside one, and recommends that the second should be coloured light to prevent similar mistakes.

CAPTAIN GILMOCK.—Commander of the steamer "Independence," agrees with Captain O'Neill in the above.

PATRICK FANNEGAN.—Is one of the pilots of the harbour. He is quite satisfied with the buoyage; and thinks, when the new beacons are put down, the river will be well marked.

He brings vessels up and down at night on the nights the steamers are going or coming; and he could do so as well by night as by day if the lights on perches were constantly lighted. Ships run for the harbour when the lanterns are lighted, but do not venture to do so on nights when they are not lighted.

Was one night on board a vessel called the "Catherine," when that vessel, with two others, the "British Token" and the "Liskard," in putting back went ashore. This was caused by the lights being out in a night when they were expected to be kept lighted for the steamers.

PATRICK MCGARRY.—Is one of the pilots of the harbour. He brings vessels up and down by night when the lights are burning, but would not venture to do so on other nights, unless very clear.

DUNDALK and GALWAY.

If the lights were constantly lighted would bring vessels up or down any night, and considers it would be a great advantage to be able to do so. Could bring in vessels at night when beacons are all up, but would much prefer their being lighted. Vessels can run in easily when the lights are visible.

He approves of the buoyage, and does not want any more buoys.

CAPTAIN BROWN.—Is master of the schooner "Dundalk," and has been 30 years trading out of the port. He is satisfied with the buoys. The beacons might be improved; they are now merely poles, and thinks they ought to have something at their heads to show better at night. He thinks the Pile light at the bar answers its purpose well.

S. R. GRAVES.

LLOYD'S EVIDENCE.

I. Richard Needham, civil engineer, Dundalk; engineer to the Dundalk Harbour Commissioners.

II. PORT OF DUNDALK.

III. The Commissioners for preserving and improving the Port and Harbour of Dundalk, acting under the authority of an Act of Parliament; 15 in number, Samuel Jackson, Esq., J.P., Chairman, Dundalk.

IV. Yes.

V. The only improvement is erecting beacons in place of perches (these are single poles) properly constructed of timber; I have already two put up, and others will be erected next year.

VI. No additional ones are required.

VII. Oil.

VIII. I am not aware.

IX. One was displaced in consequence of the chain breaking during a gale of wind.

X. I know of none.

XI. No tide signals are used at present, but I would recommend a ball to be placed on the lighthouse, near the bar, to be hoisted up a pole on flood tide as soon as there was eight feet of water on the bar, and remain up until the tide fell to the same level.

XII. No fog signals are in use at present, but the Commissioners have arranged with the Ballast Board of Dublin, who erected the lighthouse, to place a large fog bell on it, to be rung by machinery—this is in course of construction.

XIII. Marking buoys and beacons red; mooring buoys black.

XIV. No.

XV. None, except on mooring buoys. Enclosed is a schedule of the rates for these, one half charged.

XVI. I know of none.

XVII. They are considered efficient.

XVIII. No complaints are made.

XIX. Certainly.

XX. I am not.

9. GALWAY.

BUOYS AND BEACONS.

1. Galway Harbour Commissioners (Act, 1853). Secretary, Rev. John D'Arcy, Galway.

II. Jurisdiction extends from Galway to Hag's Head on the south, and Golan Head on the north entrance to the bay. There are no subdivisions. There are but three buoys under the management of this authority, namely, two on the bar at the mouth of the River Corrib, and one near the entrance to the docks; there is not any income derivable from them.

III. No.

IV. None, except the harbour master, Mr. Laurence Moore, New Docks, Galway.

V. They are not classified; they are all river or warping buoys. Sketch of buoy annexed.

a. Wood, bound with iron straps and hoops.

b. From 18*l.* to 20*l.*

c. Cost of repairs not entered in accounts separately, so not ascertained.

d. Cost of materials (paint) for each buoy annually, 15*s.*

e. Three.

f. Four.

g. They are all kept on the eastern pier head.

h. Four buoys complete (without moorings).

i. One.

j. Shackle pin gave way.

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- k. One is secured to an anchor sunk in the sand at low water; another is secured to a large stone; and the third is secured by a lewis bolt driven into solid rock; the mooring chains are eight fathoms long and one inch diameter.
- l. None of the buoys are moored in five fathoms water; they are all fixed at low water line (ext. spring tides). The cost of new set of moorings is about 10*l*.
- m. They are repaired by men employed under the inspection of the harbour master.
- n. The buoys are all painted red; there are no means adopted to render them visible by night or in time of fog.
- o. None.
- VI. The conical buoy is found to answer best in the tideway here.
- VII. The buoys are taken up for repair and overhauling annually.
- VIII. None.
- IX. There are no beacons under the control of this authority.
- X. Same reply as to No. IX.
- XI. No change has been made in the buoys under this authority since they have been put down.
- XII. The two buoys on the bar are placed one on each side of the deepest channel; the third is fixed as a warping buoy midway between Nimmos' pier and the old dock pier.
- XIII. Same reply as to No. IX.
- XIV. The buoys are maintained by this authority out of the funds raised by the levy of port dues.
- XV. Same reply as to No. IX.
- XVI. There is no income derivable from the buoys, and no account has been opened of the cost of their repair.
- XVII. No such applications made.
- XVIII. Said authority made no application for power to place any new buoy or beacon since October 1853, but applied to the Ballast Board on the 27th September last, to erect a light in room of a buoy on the Santa Margarita Shoal.
- XIX. The buoys are inspected frequently by the harbour master.
- XX. Same reply as to No. IX.
- XXI. The pilots are immediately informed by the harbour master if a buoy has slipped from its station; these are the only parties it is necessary to inform.
- XXII. The harbour master attends to it immediately.
- XXIII. It is reported in writing to this authority.
- XXIV. None.
- XXV. None.
- XXVI. None.
- XXVII. There are two buoys and three beacons fixed within the limit of jurisdiction of this authority, but they are entirely under the management, care, and control of the Dublin Ballast Board, and the light-houses are under the same Board.

Attended a meeting of Harbour Commissioners and other gentlemen interested in the trade of port.

The Rev. Peter Daley, P.P.—Stated that there was originally a light on Arran Island in the centre, and very high. This was extinguished, and there are now two, one at each end; they are a benefit to the outside navigation. The lighthouse on Mutton Island was erected 25 or 30 years ago.

Complained of a buoy on the Margarita Shoal and a perch on the Black Rock, two dangerous shoals off the entrance, as being too small, and of a buoy off the south-east entrance of the South Ormes Island, all of which are the property of the Ballast Board, and under their superintendence.

The Harbour Commission owe to the Board of Works about 20,000*l*. The collector acts as receiver for Board of Works, and all outlays must be submitted to that department. The harbour dues for the year ending July 1859 were 2,000*l*. The surplus, after paying necessary outlay, is taken as interest on debt due to the Board of Works. The new line of transatlantic steamers is exempt, by permission of Board, from harbour dues for two years. After that the Commissioners hope the dues will amount to between 3,000*l*. and 4,000*l*. By Galway Harbour Act, 1853, clause 8, the jurisdiction of the Harbour Board, as regards pilotage, extends from Gutin Head to Hogs Head, and, for purposes of pilotage and

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conservancy and tolls, from proposed Pierhead south-east of Mutton Island to Renville Head. N.B.—This line passes inside the shoals Margarita and Black Rock.

Commander Clarke, R.N., Revenue.—Killaney Bay, on the inner shore of the northern Arran Island, is a valuable harbour of refuge from south-west gales, although vessels must get away from it in north and north-east gales. This harbour was well illuminated when the old high light was shown on Arran Island. Now the fishermen have great difficulty in finding out the anchorage at night. A light on Straw Island high enough to throw its rays nine or ten miles up Galway Bay would answer two purposes, it would re-illuminate Killaney Bay and light vessels up Galway Bay, which latter point is very necessary now that the two lights on Arran Islands do not show up Galway Bay from the decks of small vessels, being hid by land on the islands.

With a good light astern vessels would be able to run boldly up until they sighted the lights at Galway. There are 1,000 sail of fishing boats in Galway. These and the rapidly increasing trade of the port suggest the propriety of improvements in the illuminating and buoying of the harbour and its neighbourhood. Captain Clarke considers Mutton Island, light a weak inefficient light, and thinks, also, that it might be raised a few feet with advantage, so as to give greater range; but if Margarita Shoal is marked by a lightship this would not be necessary. At present Margarita Shoal is marked by a very inefficient buoy, 4½ feet high only above the water line. Captain Clarke has passed close to it without seeing it. The shoal is very dangerous to deep-draught ships, although not to small vessels. The sea never breaks on it. The lightvessel might be placed about two cables length to the westward of it. The Black Rock is on the north shore, about 1½ miles north of the Margarita. It has a dangerous spit to the south-west. The rock has a perch, but it is quite inefficient. A large buoy would be preferable to a beacon, as there is more than 12 feet water on the shoal at dead low water, spring tide, and vessels might strike on the beacon.

Captain Fell, "Ada," of London.—Has been in 11 or 12 times, likes the North Arran light very much. Mutton light is very inefficient, and the buoy and perch very indistinguishable; passed both last time without seeing them. Never saw Mutton light more than 9 or 10 miles off. Thinks both shoals should be much better marked.

General.—Captain Fell,—

Black Rock wants a light. Sunden light very dim at three to four miles.

Clew Bay is a good harbour of refuge, but strangers should be careful.

Galway Bay is best for strangers.

Captain George Foot, brigantine "Kanet," Nova Scotia:—

In making Galway Bay in a gale of wind at night, could not tell Loophead light and South Arran from one another, both being bright fixed lights and contiguous.

Three days without observation.

Suggests, if North Arran is revolving red, would not South Arran Rock fixed red be a good change?

Finnis Rock off south-east end of South Arran appeared to Captain Took to project further than given in chart.

Owing to Margarita buoy being white, could not distinguish it until it was only a cable's length off.

If South Arran light was changed and a lightship placed off Margarita Shoal, he could run boldly in and up at night; it would as soon run for Galway as any bay on the coast.

Captain William Hughes.—"Alice Isabella," of Cardigan, with slate, lay up with a north-east wind, ran for Mutton light on a safe bearing, passed between, but neither saw buoy or beacon. Would run

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Observations by Commissioners.

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by Commis-
sioners.

for Galway with confidence if there was a light at Margharita.

Captain G. Schepke, of Dantzic.—"Alicie and Mary," 358 tons, timber. I think North Arran Island light very good. Would run up bay in any weather, but could not pass the shoals unless they were better marked. He was mate of a vessel in 1843 that was lost on Skerryvore while workmen were employed there erecting the lighthouse.

Recommends a light on Straw Island.

Captain C. Boje—"Alexander," 1½ feet, Dantzic. First visit. Pilot of Arran Island ran vessel right up and anchored off Mutton Island by bearing of light. If there was a lightvessel, would not hesitate to run in.

Joseph Evans, pilot master.—Thinks any one could run a ship up if there was a lightvessel. A lightvessel would be sufficient; and, in that case, Black Rock need not necessarily be more efficiently marked.

Lighting the Black Rock would be the next best. (This might be done at much less than half the expense of the lightvessel.)

A large bell buoy at the Margharita would be better than nothing, but the danger would still be very great, as the bell would not ring in a fog.

A light on Straw Island would be *very useful*, and would light vessels up the bay.

Mr. Oliver, 2nd pilot, concurs in above.

A large portion of the bay is now unilluminated since the high light was extinguished. As the northern light only shows in a portion of the northern part of the bay, you must be two miles westward of Blackhead, and on the opposite shore and close in before you see northern light, it being shut in by the land and a hummock also interposes, and extinguishes the south light for some time. The placing of these lights was directed without any consultation with the resident pilots.

The buoy on the Margharita is only one-third the size of the last buoy placed there.

Would advise a tide signal at Straw Island light if put up.

Captain Kelly, superannuated master of the "Amphitrite," revenue cruiser.—Would recommend a tower beacon on Black Rock and a buoy on the Spit; a lightvessel off Margharita; and, as next best, a light on Black Rock with a red ray towards Margharita.

For outside navigation, the lights on Arran Island are very good, but for inside navigation, not good.

Southern light should be raised or site altered so as to throw a light up the bay.

General.—A light on Straw Island very good. Black Rock outside should be lighted, and Arranmore also. The Skerry, 10 miles off, and Illanmore might be lighted with advantage. Englishman's Rock off Great Man's Bay wants a beacon.

Thinks southern Arran light should be red fixed.

Mr. F. Perse, agent for Lloyds, thinks a lightvessel should be placed on Margharita, or a light on Black Rock, as next best. Has had vessels drawing 22 feet brought to Galway.

There is no doubt but that the Margharita shoal is *very dangerous* for deep ships approaching Galway, and should not be permitted to remain longer unmarked. The rock is stated to be outside the jurisdiction of the Harbour Commissioners. A suggestion was made that Mutton light, when raised and improved, should show a bright light through the passage, should show red in the direction of Black Rock, and also to the southward of the Margharita. This, with a large bell buoy on the Margharita, would perhaps be the next best mark if a lightvessel is not placed there.

10. KENMARE.

LLOYD'S EVIDENCE.

I. John W. Jernyn, Castle Cove, Kenmare, Co. Kerry, shipowner.

II. KENMARE RIVER.

III. Nil.

IV. Not sufficiently buoyed.

V. See answer VI.

VI. At Maiden Rock, which, although laid down in the recent chart, the exact position of it is not easily determinable when navigating the river. At a sunken rock in Coulagh Bay not far from Inesferd Island, near the track of vessels taking refuge in Ballycrovane harbour, a place most invaluable and much frequented.

VII. Nil.

VIII. Nil.

IX. Nil.

X. Cannot specify accidents, but there have been several escapes, much danger, and great alarm.

XI. Nil.

XII. Nil. See answer No. VI.

XIII. Nil.

XIV. Nil.

XV. Nil.

XVI. Complaints have been numerous; cannot say if they have ever been addressed to the proper authority.

XVII. That buoys are much wanted at Maiden Rock and Sunken Rock in Coulagh Bay. See answer No. VI.

XVIII. Nil.

XIX. Nil.

XX. Nil.

11. LIMERICK.

LIGHTHOUSE.—(SPECIAL RETURN.)

I. Limerick.

II. Ballast Office, Dublin, by whom all matters and things connected with lights and lighthouses are ordered and conducted, and over which the Harbour Commissioners of Limerick have no control whatever.

BUOYS AND BEACONS.

I. Harbour Commissioners of Limerick.—W. Randall, Harbourmaster.

II. All buoys and beacons are under the sole control and management of the Ballast Board in Dublin. No power whatever is delegated to the Harbour Commissioners.

Thursday, 10 p.m.—Reached Limerick. Were received by appointment by Assistant Harbour Master. Made arrangements to meet the Harbour Commissioners, pilots, &c., early next morning, and to start, as soon as the tide served, in a tug which we hired for the purpose, down the Shaunon, a distance of about 60 miles, to inspect lighthouses and buoys.

Friday, 23d September, 9 p.m.—Met pilots and shipmasters, Simou Kelly, 17 years pilot, Mic. Fitzmorris, 27 years pilot, Morgan Fitzmorris, 36 years pilot, Captain Gorman, Captain Kennedy, Erin-go-Bragh, Captain Fitzmorris, Dover Castle, at harbour master's office. Ascertained that, although numerous buoys existed a few years since in the river, marking all the shoals, yet that when the Harbour Commission was created, the Chamber of Commerce, who had placed the buoys by their private funds, ceased to have charge, and the buoys were transferred to the Harbour Commissioner's care; they were then allowed to break adrift, and were never replaced.

The following is a list of shoals, &c., which, in the opinion of the pilots, &c., should be marked by buoys, &c. (The pilots gave their opinion irrespective of any possible injury to their interest, by the placing of buoys. It was remarked by Captain Kennedy, the very intelligent master of the "Kilrush" passenger boat, that the river was so intricate that, however well buoyed, no stranger, or even a person well acquainted, would dare to run up without a pilot.)

Ball Bar, and opposite Kilcardine, dry at low springs, a buoy.

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Scattery Roads much used as a harbour of refuge; Scattery Shoals, 10 feet at low water spring tides, a large buoy.

Carig Island Shoal, deep water close to it, by hugging it avoid Scattery Shoal, a pile light.

Tarbert Roads, edge of mud, buoys.

Bowlines Rock, has caused wrecks, has now a small perch, requires a buoy.

Long Rock, dry at low water, very dangerous, no marks for it, good beacon or buoy.

Foynes Roads, well buoyed, a small light would be useful.

Herring Rock, on south shore, dries in three hours, a buoy on northern tail.

Beeves light, very useful up and down river; since it has been placed vessels of large draught run up at night.

At Beagh Castle anchorage good; entrance of Clare River, Milauns Children, a buoy.

Walters Bank in mid-channel, two buoys, north and south.

Bridges Rock in mid-channel, a buoy on south side.

Bridges Rock on south shore, a buoy on north edge.

Bird Rock on north shore, three hours dry, a buoy.

Logheen Rock, near Grass Island, three hours dry, a buoy.

Hogshead Rock eastward of Battle Island, dries at dead low water, a buoy.

Slade Rock, a buoy.

Scarlet Rock, north tail end, a buoy.

Whelps Shoal, dries at low water, ships occasionally ground on it, two buoys, on north and south edge.

Horrils Rock, "Columbus" wrecked on it, a buoy.

Mucknuish Mud, two or three buoys to round the edge.

Cock Rock, a buoy.

Coonagh Point, a buoy.

Point of Barrington Quay, a buoy.

A foul ground off Palmer's Mud, a buoy.

Total.—1 pile light, 1 beacon, 21 buoys.

We were informed that the Upper Shannon was well marked by beacons.

Captain Kennedy stated that channel below Limerick was rapidly filling up, and required dredging. There is only nine feet where he remembers 14.

General.—Captain Gorman, 101 voyages up and down St. Lawrence; thinks lighting there very much improved; has been 56 times through Straits of Belleisle; recent light useless, too high, on wrong side and always in fog. Fog gun, Isle of Bique, at short intervals, very efficient.

Met Members of the present Harbour Board, and some of the principal merchants, &c., at the board room at 10.30 a.m.

In chair, the Mayor, R. Ryan, Esq.

The present Harbour Board was established by Act of Parliament, but is encumbered with a debt of 205,000*l.*, which has now, by arrears of interest, accumulated to about 230,000*l.* Of this about 80,000*l.* was laid out on a bridge at Limerick, connecting two agricultural counties, totally unconnected with the shipping. The small lock partially completed by the side of the bridge, with the ostensible object of benefitting the shipping is perfectly valueless. The Board of Works has given from time to time occasional loans for docks, &c., as, for instance, 50,000*l.* for a new dock, a dredge boat, and widening of gates of docks. The principle adopted as to repayment being that the receiver pays over to the Board of Works all receipts on harbour dues after absolutely necessary expenditure has been deducted. The total receipts are now about 7,000*l.* a year. We were informed that all unusual expenditure has to be approved of by Board of Works in the first place. The Commissioners stated that they had no doubt

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that the Board of Works would grant an outlay on buoys if we recommended it.

There were 40 Commissioners at first, but they are now reduced by death to 15, who are elected by the 14 ratepayers on goods imported in steamers: only 70 or 80 vote out of 150. No political bias shows itself in the elections. All members are commercial men.

Chartered a tug to take us down the Shannon, to visit the lighthouses, &c. Started from Limerick at one o'clock. It was high water, and we passed over many of the shoals, but could see that the channel was very intricate, and required careful buoying. A large vessel was aground in the river. We visited the Beeves lighthouse (see description): landed at Tarbert, visited the lighthouse (see description); then proceeded to Kiltardine and visited it about 9 o'clock (see description). The night was too dark to allow us to return to Limerick, and too stormy to permit us to proceed to Loop Head; so we anchored at Foynes Roads, which we found well buoyed, and next morning, Saturday, returned to Limerick, and left for Galway, where we arrived at 4 o'clock in the evening.

A. P. RYDER.
S. R. GRAVES.

LIMERICK.

Observations
by Commis-
sioners.

LLOYD'S EVIDENCE.

Circular VI.

I. Francis Spaight, Limerick, merchant, shipowner, and agent for Lloyd's.

II. LIMERICK and RIVER SHANNON.

III. Ballast Office, Dublin.

IV. I do not consider the port, river, or coast sufficiently well lighted, buoyed, or beacons.

V. A light on Western Island of the Baskets, on southwest end of Scattery Island, and on Grass Island.

VI. See foregoing. All the rocks in the river want buoys or beacons, there being only one so marked, the Scarlets, by a beacon, and an iron pole (quite worthless on Bolands Rock; about twenty buoys or beacons would be required; reasons: complaints of masters of my own vessels and others requiring them.

VII. Oil.

VIII. I am not aware.

IX. The river has been for a long period without buoys or beacons; many accidents have occurred. The Russian ship "Constantine" got on the rocks off Cratloe, about five miles from here, a few years since, with a full cargo of Indian corn, in narrow and sheltered part of the river, rock not buoyed or beacons, the ship opened, became a perfect wreck, and was condemned; the cargo was damaged.

X. The case of the "Constantine," in the foregoing.

XI. None used, nor do I think them necessary.

XII. None used; a gun for Loop Head would be most useful, bells for the other lights.

XIII. None here, except tower of the Scarlets, which is a round tower of grey limestone; there is also iron pole on Boland's Rock.

XIV. Supply them first.

XV. $\frac{3}{8}$ *d.* coastways per ton, $\frac{3}{4}$ *d.* foreign, for the three local lights, Kiltardine, Torbert, the Beeves, paid at Custom House, for the Trinity Board or Ballast Office, Dublin.

XVI. I am not aware of any regular complaints having been sent to the Ballast Office.

XVII. All complain of their insufficiency.

XVIII. That there is not sufficient value got for them.

XIX. I do not know.

XX. That they do not give enough for what they receive.

I. Mullock and Sons, ship brokers.

II. RIVER SHANNON, PORT OF LIMERICK.

III. Ballast Office, Dublin.

IV. We do not consider them sufficiently lighted or buoyed.

V. There are no buoys, and only two beacons, in the entire length of the Shannon; we could not suggest any alterations in these.

VI. We are not sufficiently acquainted with the shoals, rocks, and dangers in the river, to answer this question.

VII. Do not know.

Circular VI.

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LIMERICK and LONDONDERRY.

- VIII. We are not aware of any such.
 IX. We are aware that no buoys have marked the channel for a number of years.
 X. Many accidents have occurred within our recollection, but we cannot attribute a cause.
 XI. No tide signals are used, nor do we think any necessary.
 XII. We are not sufficiently acquainted with this matter to give an opinion.
 XIII. No buoys; beacons on Bowlings Rock, staff and vane; Scarlet Rock round tower, not coloured.
 XIV. Cannot give an opinion.
 XV. Dues are levied for lights, but none for beacons or buoys.
 XVI. We are not aware of any.
 XVII. The feeling of mariners frequenting this port is universal that lights, buoys, and beacons are altogether insufficient.
 XVIII. We are not aware of any discontent as to charges.
 XIX. We know nothing to the contrary.
 XX. No, we are not.

Circular VI. I. Daniel Gorman, commander ship "Jessy," of Limerick, No. 6, Newnham Street.

II. PORT OF LIMERICK and RIVER SHANNON.

III. The Ballast Office of Dublin.

IV. There should be a light on the Forze Rock off the Blaskets, as a guide for the Shannon or for Galway. Ships coming from the westward or coasting have frequently to heave to for daylight, to make sure of the land; if they saw the light on the Forze Rock, they could run in perfect safety for the Shannon; the light on Loop Head is very good.

V. The lights on Kileredane; the red light is seaward, and the bright one up the river; we cannot see the red light till very close to it, owing to the boggy country behind the light; the bright light should be seaward, and red light to show up the river.

VI. A can buoy, with staff and vane, on the Herring Rock; can buoy on the Bank of Wallers, with staff and vane; one on the Bridge Rocks, one on Loughings Rock, one on the Hogsheads, one on the Slate Rock, one on the Scarlett Rock, one on Havels Rock, one on Muckinnish Spit, one on the Elbow of the Spit, one on Coonah Point, one on Kilmish Beg. A light on Scallery Point, to enable ships to anchor in a proper roadstead, would be of the utmost service.

VII. Oil.

VIII. None.

IX. Formerly the river was buoyed, but this last twenty years past there have been no buoys; my ship, "Jessy," Spaight and Sons owners, has frequently been on shore, and many other vessels, for the want of buoys, and suffered serious damage.

X. A bark got on the Reeves Rocks before the light was placed there, and became a total wreck; one vessel, near the Scarlets, became a wreck for want of buoys, and the brig Thetis broke her keel, with many more.

XI. A large gun on Loophead would be of great service to fire off every hour in fog or very thick weather.

XIII. There are no buoys.

XIV. Black buoys could be seen best.

XV. Lights to the collector of customs.

XVI. No complaints.

XVII. Lights are good, but the feelings of the mariners are the river should be buoyed, when there is so much trade to prevent accident.

XVIII. The freights are so poor; there is a general feeling of discontent amongst mariners paying light dues.

XXI. Do not know.

XX. Do not know.

LONDONDERRY.

- IV. This question not applicable to river navigation.
 V. Holophotal, and lamps with reflectors.
 VII. Fixed.

TABLE OF PRICES.

RED CASTLE.—Holophotal. One burner.

Price	-	-	-	Account not furnished.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - $\frac{3}{4}$ gallon.
				Cost - - - 2s. 11d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

WHITE CASTLE.—Common Lamps, with reflectors. 10 burners.

Price	-	-	-	Included in cost.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - 2 $\frac{1}{2}$ gallons.
				Cost - - - 7s. 1d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

TURE.—Common Lamps, with reflectors. 14 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - 2 $\frac{1}{2}$ gallons.
				Cost - - - 8s. 4d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

CUNNYBERRY.—Common Lamps, with reflectors. 16 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - 2 $\frac{1}{2}$ gallons.
				Cost - - - 9s. 2d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

CULKEERA.—Common Lamps, with reflectors. 9 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - 2 gallons.
				Cost - - - 6s. 8d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

CULMORE.—Common Lamps, with reflectors. 2 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - $\frac{5}{8}$ gallon.
				Cost - - - 2s. 1d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

BOOMHALL.—Common Lamps, with reflectors. 2 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - $\frac{5}{8}$ gallon.
				Cost - - - 2s. 1d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

ROSSES BAY.—Common Lamps, with reflectors. 5 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - 1 $\frac{1}{2}$ gallons.
				Cost - - - 5s.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

ROCK.—Common Lamps, with reflectors. 2 burners.

Price	-	-	-	Not known.
Ordinary repairs	-	-	-	—
Oil	-	-	-	Consumption - $\frac{5}{8}$ gallon.
				Cost - - - 2s. 1d.
Wicks	-	-	-	Consumption - - -
				Cost - - - - -

XI. Oil, wick, and tow. No means adopted for testing quality.

XII. No fog signals.

XIII. No tide signals.

XIV. None.

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LIGHTHOUSES.—(GENERAL RETURN).

Circular II. I. The Londonderry Port and Harbour Commissioners constituted under the 17 & 18 Vict. chap. 177.

II. One pile lighthouse at Red Castle; one ditto at White Castle; one ditto at Ture; one ditto at Cunnyberry; one of stone at Culkeeragh; one mast and lantern at Culmore; one of stone and wood at Boomhall; one lightvessel in Rosses Bay; and one mast and lantern at Pennyburn. All bright fixed.

LONDONDERRY.

XV. See Return No. 1.

No. 1.

PORT AND HARBOUR OF LONDONDERRY.

RETURN showing the Amounts expended in keeping and maintaining the Harbour Lights from the Year 1845 to the Year 1858.

Year ending	Cost of Repairs and Incidental Expenses.		Wages.		Oil, Wick, and Tow, &c.		Cost of Erection of Lighthouses.		Total.		Observations.	
	£	s.	£	s.	£	s.	£	s.	£	s.		
31 October,	1846								280	14	11	In the Cost of Repairs, &c. for the year 1846 is included the cost of two lighthouses, A temporary light-house was erected at the Rock this year at a cost of about 60 <i>l.</i> , which is included in the Cost of Repairs for that year.
"	1847	4	1	26	10	10	—	—	342	1	3	
"	1848	315	7	26	14	2	—	—	144	5	11	
"	1849	54	6	69	19	5	—	—	114	6	4	
"	1850	8	15	60	10	0	—	—	122	0	2	
"	1851	9	15	75	15	9	—	—	326	13	11	
"	1852	23	2	65	11	8	187	5	407	5	7	
"	1853	30	19	94	6	2	253	15	730	10	3	
From 31 Oct. 1853 to 31 Dec. 1854 (14 months)				32	12	0	68	12	263	13	1	
31 December, 1855				64	3	2	76	0	300	0	0	
"	1856			21	11	5	46	4	432	4	7	
"	1857			5	4	8	290	1	69	14	0	
"	1858			12	1	8	95	3	394	14	5	
				846	13	3	156	9	386	19	2	
							835	6	1,347	6	3	
									4,527	11	3	

a This amount includes the cost of erecting a lighthouse at Cunyberry, b Ture lighthouse, c Culkeeragh lighthouse, d White Castle lighthouse, e Red Castle lighthouse, f Boomhall lighthouse.

Londonderry, 25th July, 1859.

XVII. No applications for power to construct lighthouses.
XVIII. None.

XIX. The lighthouses in this harbour have been erected from time to time, mainly for the accommodation of steamboat navigation, without reference to any general principles as regards lighting, with the exception of the Holophotal system of lighting, which was adopted at Red Castle, Ture, and Culkeeragh lighthouses, on the suggestion of Messrs. D. and T. Stevenson, Civil Engineers, of Edinburgh.

LIGHTHOUSES.—(SPECIAL RETURN).

- I. Londonderry.
- II. Londonderry Port and Harbour Commissioners.
- III. A. H. Stewart, Secretary to the Londonderry Port and Harbour Commissioners.
- IV. Nine lights. From Pennyburn light to lighttressel in Rosses Bay, 1½ miles. From lighttressel to Boom Hall light, ½ of a mile. From Boom Hall light to Culmore light, 2 miles. From Culmore light to Culkeeragh light, ¼ of a mile. From Culkeeragh light to Cunyberry light, 1 mile. From Cuny-

LONDONDERRY.

berry light to Ture light, 3 miles. From Ture light to White Castle light, 3½ miles. From White Castle light to Red Castle light, 1¾ miles.

V. No application. The members of the Ballast Office Committee saw the necessity for their erection.

VII. To enable steamers and sailing vessels to navigate the river during the night.

VIII. 1840.

IX. Capt. Wm. Coppin, Builder. D. and T. Stevenson, Edinburgh, Engineers. By contract.

X. All harbour lights.

XI. One of stone, one of stone and wood. Two masts with lanterns. Four pile lighthouses and one light vessel. Red on the starboard hand, and black on the port hand.

XII. No.

XIII. Fifteen to twenty feet.

XIV. Twenty to fifty feet.

XV. None.

XVI. A distance of seven miles; from Mugilligan Point to Red Castle light; thence from light to light.

XVII. All fixed; bright.

XX. From sunset to sunrise.

XXI. At present in use common lamps, with reflectors, and Holophotal system.

XXII. Fourteen to two in each common lamp, and one in holophotal.

XXIII. Holophotal system of lighting substituted for the common lamp in Red Castle lighthouse in 1858 and in Ture and Culkeeragh in 1859.

XXIV. Milne and Son, Edinburgh.

XXVI. None.

XXVII. None.

XXVIII. No registry.

XXIX. For cost of construction, see separate Return marked No. 1. No buildings adjoin any of the lighthouses. No charge for site. Mr. Baird, upon whose property the Boom Hall lighthouse is erected, charges a nominal rent of 1*s.* per year.

XXX. None in course of erection.

XXXI. Not purchased.

XXXII. About 27*l.* per annum. Not by contract.

XXXIV. 100*l.* per annum for buoys and beacons and lighthouses. By contract. Coated annually.

XXXV. Nine keepers; one for each light. Their weekly wages ranges from 7*s.* 6*d.* to 1*s.*

XXXVI. Accounts for the Holophotal system not yet furnished. Cannot state the exact cost of the old lamps.

XXXVIII. See Returns Nos. II. and III.

XXXIX. Pale seal, 4*s.* 4*d.* and 3*s.* 9*d.* per gallon.

XL. 1857, cotton wick, 1*s.* per bolt; 1858, cotton wick, 1*s.* 3*d.* per bolt.

XLI. None.

XLII. Maintained from the income of the port. The Londonderry Port and Harbour Commissioners' Office.

XLIII. No income from lights during the periods mentioned.

XLIV. 1852, 407*l.* 5*s.* 7*d.*; 1858, 396*l.* 19*s.* 2*d.*

XLV. No complaints.

XLVI. None.

XLVII. None.

XLVIII. No complaints.

XLIX. No complaints.

L. Harbour master.

LI. August and June.

LII. Not extinguished.

LIII. Spare lamps on hand. Oil stored with contractor.

LIV. None.

LV. None used.

LVI. None.

LVII. The keepers engage to keep the lights, and when relieved it is by assistants provided by themselves.

LVIII. Required to keep up the lights from sunset to sunrise. One person to be always in charge.

On the 19th, at 10 p.m., a small stone lighthouse, Observations some miles below Londonderry, was visited, No. 47 on by Commissioners. The list. It is a leading light for running into Lough Foyle. The apparatus is a small Stevenson's apparatus, holophotal fitted with one burner, lately placed instead of nine burners, in three concave reflectors. The lens was of cast or moulded glass, and was placed with the wrong side next the flame. The light is kept by two old women, who are paid 7*s.* a week. They themselves have built a wooden hut for sleeping in. They had a fire in a small room in the lighthouse itself. One woman has been 14 years in the service; her share of the work appeared to be well done. The reflectors

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Observations
by Commis-
sioners.

were clean, and the lamp burning well. The house itself was very dirty, and much in want of whitewash. The roof of the light-room was quite black, and the keeper said that she had often thought of getting some whitewash, and putting it to rights herself. She cleans reflectors with whitening. Those which she has cleaned for many years were shown, and were in good order, though badly shaped. This woman has an infirm brother who was formerly a light keeper, and is now dependant on her. He was seated by the fire, and was evidently unable to work.

Name of Light.	Oil expended by each Light in 100 Hours, averaging the Months of January and February.	Average each Night.	Cost of Oil.
Red Castle	3 quarts 1 pint	1 pint	£ 0 0 0
White Castle	2 gallons 1 pint	1 pint	0 0 0
Ture	4 "	"	0 0 0
Cunnyberry	6 "	"	0 0 0
Culkeeragh	3 "	"	0 0 0
Culmore	5 pints	"	0 0 0
Boom Hall	5 "	"	0 0 0
Rosses Bay	1 gallon 4 pints	"	0 0 0
Pennyburn	5 pints	"	0 0 0
	13 gallons 5 pints		£ 2 5 5

QUANTITY OF OIL AND STOKES expended at the several Lights in the Year 1857.

Station.	Pounds Flw.	Quarts and Pints Turpentine.	Bolt and Dozens Wick.	Skins Shammy Leather.	Pounds Whiting.	Rotten Stone.	Matches Boxes.	Brooms.	Total
Red Castle	12	1 1/2	5 bolts and 30 doz. wicks.	2	6	8	28	4	£ 2 5 5
White Castle	14	1 1/2	6	2	6	8	29	4	£ 2 5 5
Ture	14	1 1/2	6	2	6	7	30	3	£ 2 5 5
Cunnyberry	14	1 1/2	5	2	6	6	30	3	£ 2 5 5
Culkeeragh	12	1 1/2	5	2	5	6	27	4	£ 2 5 5
Culmore	6	1	2	1	3	4	12	2	£ 2 5 5
Boom Hall	6	1	2	1	3	4	12	2	£ 2 5 5
Rosses Bay	8	1 1/2	5	2	4	4	20	4	£ 2 5 5
Pennyburn	6	1	2	1	3	4	12	2	£ 2 5 5
	92	12	39 doz. 4s. and 1s.	15	43	53	201	28	£ 13 3 3d.
	4d. per lb.	4s. per gall.	1s. 3d. per skin.	1d. per lb.	1	3d.	8s. 4d.	7s.	£ 6 19 9
	£ 1 10 8	12s.	£ 2 1 0	18s. 9d.	1	13s. 3d.	8s. 4d.	7s.	£ 6 19 9

No. 3.

QUANTITY OF OIL AND STOKES expended at the several Lights in the Year 1858.

Station.	Pounds Flw.	Quarts and Pints Turpentine.	Bolt and Dozens Wick.	Skins Shammy Leather.	Pounds Whiting.	Rotten Stone.	Matches Boxes.	Brooms.	Total
Red Castle	12	1 1/2	5 bolts and 30 doz. wicks.	2	6	8	28	4	£ 2 5 5
White Castle	14	1 1/2	6	2	6	8	29	4	£ 2 5 5
Ture	14	1 1/2	6	2	6	7	30	3	£ 2 5 5
Cunnyberry	14	1 1/2	5	2	6	6	30	3	£ 2 5 5
Culkeeragh	12	1 1/2	5	2	5	6	27	4	£ 2 5 5
Culmore	6	1	2	1	3	4	12	2	£ 2 5 5
Boom Hall	6	1	2	1	3	4	12	2	£ 2 5 5
Rosses Bay	8	1 1/2	5	2	4	4	20	4	£ 2 5 5
Pennyburn	6	1	2	1	3	4	12	2	£ 2 5 5
	92	12	39, 4s. and 1s.	15	43	53	201	28	£ 13 3 3d.
	4d. per lb.	4s. per gall.	1s. 3d. per skin.	1d. per lb.	1	3d.	8s. 4d.	7s.	£ 6 19 9
	£ 1 10 8	12s.	£ 2 1 0	18s. 9d.	1	13s. 3d.	8s. 4d.	7s.	£ 6 19 9

Circular II.

No. 2.

QUANTITY OF OIL AND STOKES expended at the several Lights for the Year 1857.

No. 4.

EXPENDITURE of OIL at the several LIGHTS in the RIVER FOVLE for the year 1857.

Name of Light.	No. of Gallons expended.	Price per Gallon.	Amount.
Red Castle	63	s. 3 9	£ 11 16 3
White Castle	70	s. 3 9	13 12 6
Ture	100	s. 3 9	18 15 0
Cunnyberry	120	s. 3 9	22 10 0
Culkeeragh	65	s. 3 9	12 3 9
Culmore	24	s. 3 9	4 10 0
Boom Hall	3	s. 3 9	0 11 3
Rosses Bay	48	s. 3 9	9 0 0
Pennyburn	18	s. 3 9	3 7 6
	511		£ 95 16 3

LONDONDERRY.

No. 5.

EXPENDITURE OF OILS at the several LIGHTS in the LOCH and RIVER FOYLE for the year 1858.

Name of Light.	No. of Gallons expended.	Price per Gallon.	Amount.	No of Burners.
Red Castle -	32	s. d. 3 9	£ s. d. 6 0 0	14 old system. 1 new system. (Holophotal.
White Castle	80	3 9	15 0 0	10
Ture - -	110	3 9	20 12 6	14
Cunnyberry	120	3 9	22 10 0	16
Culkeeragh-	75	3 9	14 1 3	9
Culmore -	27	3 9	5 1 3	2
Boom Hall -	24	3 9	4 10 0	2
Rosses Bay -	51	3 9	9 11 3	5
Pennyburn -	18	3 9	3 7 6	2
Total for 1858	537		£100 13 9	

LONDONDERRY.

- XXI. By notice to the pilots; buoys out of position immediately replaced.
- XXII. The person who has the contract for maintaining the buoys in their positions, uses every exertion to replace them.
- XXV. None tried as yet, corresponding at present with reference to a new description of buoy for the "Tuns" Bank.
- XXVI. The harbour master examines and reports on the works executed by the contractor. No general order.

LONDONDERRY.
Circular V.

The Commissioners ran up Lough Foyle, on the 16th of July, in the "Vivid," and remarked the beacons on either side of the channel. They were in good order and very efficient.

On the 18th the Commissioners met Mr. Abraham Stewart and Mr. James Mac Gee, the harbour master. It was stated that the Tuns buoy goes adrift about once a year, and it has sometimes been a month before it could be replaced. There is no spare Tuns buoy, but when adrift it is replaced temporarily by a smaller one. It is, indeed, in contemplation to substitute permanently a smaller buoy on account of the immense strain on the cable. No lightship could ride at the place of the Tuns buoy. They burn pale seal oil, because it is cheaper than rape seed oil and gives a sufficiently good light. All the keepers are men, none masters. Mr. Mac Gee is supposed to look after them. No complaint against a keeper has been made for two years, but they are rough men, and soon rub the silver off reflectors. (*One of the keepers was subsequently found to be an old woman.*) A new holophotal apparatus, just received from Messrs. Stevenson of Edinburgh, was shown. It consisted of two concentric parabolic reflectors, one on each side of the lamp, and a lens of cast glass composed of concentric annular prisms, cast or moulded in one piece, placed in the centre of each inner reflector. The Commissioners subsequently learned at Paris that lenses of moulded glass of a larger size are now made there for lighthouse purposes, and saw specimens. The reflectors are placed nearly, but not quite, back to back, so as to throw the light along the channel each way. The man who puts up the apparatus does not know whether the flat or the convex side of the lens should go next the lamp. It was stated that steamers pay one farthing per ton, and the Irish Society give 1,000*l.* a year to the Harbour Commissioners. The returns asked for on the 13th of April were not prepared.

Observations by Commissioners.

BUOYS AND BEACONS.

- I. James McGhee, Harbour Master, Londonderry.
- II. Within the last six years the Admiralty made a survey of the Lough and River Foyle, from the bridge at Londonderry to the deep sea; the chart is published, and the buoys and beacons are placed thereon, 9 beacons, 10 buoys.
- III. Not responsible to any other authority.
- IV. None.
- V. Not classed.
 - a. Iron and wood.
 - b. From 10*l.* to 20*l.*, 30*l.*, 40*l.*, and 50*l.*
 - c. Replacing and repairing about 150*l.* per annum.
 - d. 100*l.* per annum for painting and coating buoys, lighthouses, and beacons, and maintaining them in their places.
 - e. Ten.
 - f. Three iron and 3 wood.
 - g. In the contractors' yard.
 - h. Six at present.
 - i. Three.
 - j. The "Tuns" buoy by the violence of the sea, others by vessels.
 - k. Large stones with iron ring, and cast metal anchors and chains.
 - l. Say from 10*l.* to 30*l.*, and the "Tuns" buoy 60*l.*
 - m. By open tender for buoys; chains, by order, after inquiring price from different houses.
 - n. None.
 - o. None.

VI. Conical for coasts, and oval for tideways are the kinds used here.

VII. In the summer months all are painted and coated, and replaced where necessary.

VIII. Occasional inspection.

IX. Wood in water; stone on rock or land.

X. Four beacons of stone and five of wood.

- a. "Madams Bank," "Crook," "Otto Bank," and "Flats."

b. 1839, 1840, and 1852.

c. To mark the channel's edge.

d. None except that the colour will denote the side of the channel on which it is situated.

e. Wood and stone.

f. Red and black.

g. Not lighted.

h. Fourteen to twenty feet.

i. Say, 30*l.*, 35*l.*, and 50*l.*

j. See answer to XVI. query.

k. None.

XI. No alteration, except larger dimensions.

XII., XIII. Placed so as to mark the channel.

XIV., XV. From the income of the port, Londonderry Port, and Harbour Commissioners' Office.

XVI. No income from buoys and beacons. Expenditure in 1852, 77*l.* 14*s.* 6*d.*; in 1858, 235*l.* 6*s.* 6*d.*

XVII. No applications; buoys and beacons placed by the Londonderry Port and Harbour Commissioners, when the wants of the port require them.

XVIII. No application.

XIX. Harbour master; June and August.

XX. Harbour master; June and August.

Note.—The Commissioners have obtained from the Messrs. Stevenson of Edinburgh the following account of the cost of the apparatus furnished to the authorities at Londonderry, March 1860.

Circular II.

COST OF HOLOPHOTAL LIGHTS at LONDONDERRY.

The Commissioners of the Port of Londonderry to James Milne and Son, Edinburgh.

	TURE.
Furnishing one lighting apparatus, consisting of double parabolic zinc reflectors with cast-iron table and sliding plate	- - - 17 3 4
Messrs. Adie and Son, for lenses	- - - 1 1 0
	<u>£18 4 4</u>
	CUNNYBERRY.
Same as above	- - - 17 3 4
Messrs. Adie and Son, for lenses	- - - 1 1 0
	<u>£18 4 4</u>
	CULKEERAGH.
Furnishing one double zinc reflector, with spherical reflector at back, cast-iron table, and sliding plate	- - - 16 3 4
Messrs. Adie and Son, for lens	- - - 0 10 6
	<u>£16 13 10</u>

15. SLIGO.

Sligo
Circular

LONDONDERRY—NEW ROSS—NEWRY.

LLOYD'S EVIDENCE.

- Circular VI. I. Daniel Smyth, of the firm of John A. Smith & Co., general merchants, agents for Lloyd's.
 II. PORT of LONDONDERRY.
 III. Londonderry Harbour Commissioners.
 IV. An improvement in the seaboard lighthouse, on Shrove Head, at the entrance of Lough Foyle, is wanted, as it does not give satisfaction to mariners, and a light is much wanted on Magilligan Point on the south side.
 V. No alteration, except in the lighthouse above referred to.
 VI. On Magilligan Point, on the south side of the entrance. This is much wanted.
 VII. Oil.
 VIII. None.
 IX. The Tun buoy has been removed by a storm, but no accident has occurred until replaced.
 X. None.
 XI. No.
 XII. No.
 XIII. Red and black, mostly th (see sketch) form.
 XIV. None.
 XV. Sailing vessels pay no dues for the harbour lights.
 XVI. None.
 XVII. Several complaints respecting the lighthouse on Shrove Head (entrance of Lough Foyle) made by the masters of sailing vessels and steamers
 XVIII. No complaints. There is a small charge levied on steamers for the harbour lights; but none of sailing vessels.
 XIX. Yes.
 XX. No complaints.

NEW ROSS.

13. NEW ROSS.

Observations
by Commis-
sioners.

Monday Afternoon.—Visited Ross. Remarked on the entire absence, with one small exception, of buoys, although the channel is intricate. Wrote to the Chairman of the Harbour Commissioners at Ross, drawing his attention to the subject.

A. P. RYDER.
S. R. GRAVES.

NEWRY.

14. NEWRY.

Observations
by Commis-
sioners.

Visited 15th March 1860.
 The Newry Navigation Company have jurisdiction from Newry to Warren Point for the purpose of levying tolls, and to Carlingford Bar for pilotage.

The navigation between Newry and Warren Point comprises about 4 miles of canal and 2 miles of river. In the latter there are 4 buoys and 5 beacons.

The debt of the Newry Navigation Company is about 220,000*l.*, which has been expended on the construction of the canal, &c. This debt is composed of 35,000*l.* owing to government, for which 4 per cent. is paid; 15,000*l.* bonds, for which per centage varying from 4 to 6 per cent. is paid; the remaining 170,000*l.* is represented by the sunk capital of the company. The receipts last year were 6,400*l.* No dividend whatever has been paid since the company was established in the reign of George the Fourth.

Captain John Holywood, of the "Sea Boid," 133 tons (screw), and Captain Wm. Doran, of the "Merry Andrew," 62 tons, state, that a shoal point runs out below the lowest buoy in the river, which should be marked, and that there is a shoal in the middle of the river off the second red buoy which should be marked.

With these exceptions, the river and canal were considered to be satisfactorily lighted and buoyed, and the dues levied, 1*s.* 1*d.* per register ton for the double voyage, and 7*d.* per ton on the net tonnage of steamers, were not thought excessive. They are only one third of what might be levied under the Act.

ALFRED P. RYDER.
S. R. GRAVES.

BUOYS AND BEACONS.

- I. Moses Monds, Secretary to the Commissioners for the town and harbour of Sligo, acting under 43 Geo. III. cap 60. and 9 & 10 Victoria, and collector of port dues.
 II. I send a chart—the latest survey. District, east of Roughly Head. Cost of keeping buoys 25*l.* per annum. No income derived. Total number of buoys 4.
 III. No.
 IV. Nil.
 V. See sketch. One class, iron.
 a. Iron.
 b. 50*l.* to 60*l.*
 c. About 5*l.* per annum for each.
 d. 1*l.* each.
 e. Four.
 f. Nil.
 g. Nil.
 h. Nil.
 i. One.
 j. Leaky and bursting chain.
 k. Stone and chain.
 l. 10*l.*
 m. By contract.
 n. Red on starboard, black on port, in entering the harbour.
 o. Four.
 VI. Having only one class, cannot give any opinion.
 VII. Paint and replace them when required. Painted once a year.
 VIII. Looked after by the harbour master.
 IX. Nil.
 X. Nil.
 XI. No substitute.
 XII. Perches within the harbour along the line of channel, and buoys in the bay.
 XIII. A perch much required on the Wheaten Rock, where the steamer "Thistle," of Glasgow, and from Glasgow, bound to this port, was totally wrecked on the 15th December last. Application has been made to the Ballast Office, Dublin, for a buoy or perch on this rock.
 XIV. From harbour dues on ships, and import and export dues on goods payable to the Commissioners.
 XV. Nil.
 XVI. Nil for income. Expenditure for 1852, 24*l.* 10*s.*; for 1858, 35*l.*
 XVII. Nil.
 XVIII. In 1848, an application was made by this authority to the Ballast Office, Dublin, to place a beacon on Wheaten Rock; they sent their engineer to survey the rocks; they worked for some time to erect a beacon, but have not done so.
 XIX. By the harbour master.
 XX. Nil.
 XXI. By the master pilot.
 XXII. The harbour master.
 XXIII. Through master pilot and pilots.
 XXIV. No record or register kept.
 a. Stone and chain.
 b. Iron.
 c. As represented on scale.
 d. Per scale.
 e. Black and red.
 f. From observation.
 g. Nil.
 h. Nil.
 i. Nil.
 j. Nil.
 k. Where required.
 l. Nil.
 m. As soon as possible after reported.
 Nil.
 XXV. Nil.
 XXVI. No general rule. Nil.
 XXVII. A beacon on Wheaten Rock, and two leading lights on lower Rosses Point, would be required to enable ships to run over the bar for the harbour at low water.

Captain Charles Walker.—Made 100 voyages to Obse d
Sligo; Seal Rocks should have a beacon. by Com

Two small lights on Lower Rosses Point to lead sion
over the bar, better than Rathley.

Bungar buoy was washed away in 1857, and had not been replaced till August 1859. Lord Drogheda's yacht, the "Fancy," was lost on the 27th August 1859. Lord Drogheda states, in consequence of the absence

SLIGO.

of the buoy not being notified. The buoy is to be replaced.

Wheat Rock at entrance had an iron pile beacon put down by Ballast Board; washed away in a week, 1855. Outer spit of Wheat Rock had a buoy 10 or 11 years ago, which was once missing, then replaced and missing again. The Harbour Commissioners hope the Ballast Board will replace the Spit buoy. Black Rock light might have red ray towards Wheat Rock.

Oyster Island lights are two nearly the same height, and show in one. The nearest should be lowered seven or eight feet. Black Rock when opened is seen 12 miles, fixed white.

General.—Thinks Arranmore relighted would be very useful. Tory Island light is very indifferent. Loch Swilly, red to seaward very dull.

Captain Walker passes Loch Swilly twice a week within two or three miles, and only sees it once in 10 times.

16. STRANGFORD.

BUOYS AND BEACONS.

- I. Lord de Ros, of Strangford, county Down.
- II. A chart is enclosed. The average amount annually collected is 45*l.*, from which has to be deducted 20*l.* salary to the harbour master, leaving a residue which seldom covers the repairs and outlay on quays, landing places, &c.
- III. It is an old manorial grant from Henry VIII. to the Earls of Kildare (my ancestors), confirmed by a patent from Charles II.
- V. The barge-pladdy buoy for mooring (a log). The crows-pladdy buoy (a log). These logs are about 7 or 8 feet long. See sketch.
 - a. Five.
 - b. About 3*l.* or 4*l.* each, with chains and mooring stones. The chains are the chief expense.
 - d. A few shillings.
 - e. Two.
 - f. Two.
 - g. None.
 - k. Chain and heavy stone.
- IX. The Cloghey Beacon; the Swan Pillar; both built of stone. See sketch. The Garter Perch (a pole). The Point Perch (a pole). The Watchhouse Perch (a pole).
- X.
 - c. As guides for passing clear of rocks.
 - f. Red and white.
 - h. Cloghey Beacon, about 30 feet; cost about 35*l.* Swan Pillar, about 18 feet; cost about 15*l.*
- XIV. From the collection of harbour and anchorage tolls, to which I am often obliged to make additions to cover the outlay.
- XVI. Total income for 1852, 46*l.* 16*s.*; ditto, for 1858, 38*l.* 14*s.*; expenditure of 1852, 38*l.* 6*s.*; ditto, of 1858, 37*l.* 3*s.*
- XVII. The above for buoys and beacons; but there were other outlays for repairs of quays and landing places; and the outlay seldom comes at all within the income, from which must be deducted the harbour master's salary of 20*l.* per annum, reducing the above to 26*l.* 16*s.* and 18*l.* 14*s.*
- XXII. Yes; the harbour master instantly attends to it.
- XXIV. No complaints; quite the reverse.
- XXVI. The principal expense at Strangford is the maintenance of quays and landing places for convenience of vessels frequenting the harbour and anchorage. Within the last 20 years the outlay on these has far exceeded the income from anchorage and harbour dues.

I have answered all the questions which seem applicable to Strangford Harbour, and shall be always ready to answer further inquiries.

May 17, 1859.

DE ROS.

HARBOUR DUES, QUAYAGE, &c., payable by Masters and Owners of Vessels, and their Cargoes, at the Quays of Strangford, and South-west side of the River of Strangford, to the Right Honourable Lord De Ros.

1. All vessels loading or discharging cargoes at the quays of Strangford, or any part of the beach, to pay twopence per

STRANGFORD.

register ton; and in case only a part of a cargo is loaded or discharged, to pay at same rate for the number of tons that may be so taken on board or discharged.

2. All coasting vessels taken in ballast, unless they have discharged a cargo at Strangford, to pay one penny per ton quayage for such ballast.

3. All vessels going foreign, taking in ballast, to pay twopence per ton quayage for such ballast, whether lying at, or moored off, the quay, unless they have discharged a cargo at Strangford.

4. Cows are to be charged at the rate of twopence per head; horses, threepence per head; sheep and pigs, one halfpenny each.

HARBOUR DUES.

5. On vessels anchoring or coming to, in any part of the south-west side of the river of Strangford:—

	<i>s.</i>	<i>d.</i>
Under 20 tons register tonnage, to pay for each trip	1	0
„ 20 „ and under 30 tons per register	1	6
„ 30 „ and not 50 ditto	2	0
„ 50 „ and not 70 ditto	2	6
„ 70 „ and not 100 ditto	3	0
„ 100 „ and upwards, ditto	3	6
All ships or three-masted vessels to pay	5	0

6. All vessels mooring or coming to anchor in the harbour of Strangford to pay at the above-mentioned rates; provided they have not paid either anchorage or quayage in Strangford on same voyage.

7. Vessels coming to anchor, first at Portaferry or Ballyhenry, may afterwards, on same voyage, anchor in Audley's Roads, or Cross Roads on Strangford side, free of charge.

REGULATIONS.

8. Vessels are on no account whatever allowed to put a chain or rope round the end of the quay, under a penalty of twenty shillings for each offence, besides paying for any damage the quay may have received in consequence.

9. All vessels in the tier next the quay-end to have out a stern anchor and cable or hawser; otherwise to be accountable for any damage she may do to the vessels in the adjoining tier. Vessels having the quay-berth to keep proper fenders between them and the quay, otherwise to be accountable for the damage done to the quay. The second and any outer tier to have proper fenders between them and the vessels inside them; or, if not, to be responsible for any damage done to them.

10. Vessels discharging any part of their ballast on the beach in the dock outside the quays, or in any of the roadsteads—unless authorized by the harbour master so to do—to pay, for each offence, twenty shillings.

11. All vessels are to take up such situation or berth at the quays as the harbour master may direct; and their berths and stations are to be changed and altered as he may judge most expedient for convenience and general safety—under a penalty of twenty shillings for each refusal made by the master, or owner, or person in charge of the vessel; and, should the harbour master think proper, in consequence of such refusal, to hire men to remove the vessel, the master or owners thereof to be accountable for the expenses incurred.

12. All square-rigged vessels lying in the hole, or at the end of the new quay, to have their lower yards peaked and studding-sail and gib-booms in, and to have one person on board, at least, when any other vessel or vessels are arriving at or leaving the harbour, under a penalty of twenty shillings, besides paying all damages that may be suffered by any other vessel or vessels, in consequence of their neglect of this precaution.

13. No ballast, merchandise, or lumber to remain on the quays longer than twenty-four hours after being discharged, under a penalty of ten shillings per day for every day each parcel may remain afterwards, unless special liberty is granted by the harbour master in writing.

14. Vessels dropping or laying out anchors in any part of the harbour must fasten a buoy to every such anchor in such a manner as that said buoy may float conspicuously; any vessel neglecting to do so shall incur a penalty of twenty shillings, besides paying all damages that may be suffered by any other vessel or boat in consequence. The ring on the island, or buoy on the Crow Rock, must never be used for mooring, but only for warping out to make sail from, and such warp must be immediately slacked for other vessels or boats passing, on being hailed to do so, under a penalty of twenty shillings.

15. All vessels requiring repairs to be removed to the Graving Banks, clear of the vessels in the harbour.

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Circular V.

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STRANGFORD AND WATERFORD.

16. Ballast supplied by harbour master from Ballast Bank, on due notice being given. No vessel will be allowed to take ballast on board from any other source, unless by permission of the harbour master. All ballast landed (except lime-stone and dung) to be immediately conveyed to Ballast Bank by the harbour master. All lime-stone and dung to pay one penny per ton, quayside, unless used on Strangford estate, or the vessel takes a cargo.

17. Vessels requiring a plank for either discharging or loading a cargo, if under 25 tons register, to pay one shilling; 25 to 50, one shilling and sixpence; 50 and upwards, two shillings—for the use of each plank. Any vessel requiring the largest plank off New Quay end, to pay two shillings and sixpence for the use of same. For wheelbarrows, discharging or taking in Ballast, one shilling each, provided the time they are in use does not exceed one day.

18. The masters and owners of vessels and cargoes, all and every of them, to be accountable to the harbour master for quayside, harbour dues, fines, &c.; same to be payable on demand.

WILLIAM RUSSELL,
Quay and Harbour Master.

Strangford, 1st January 1846.

WATERFORD.

WATERFORD.

Circular V.

XIV. Buoy inside Passage from tonnage duty; buoy outside Passage from pilotage; both payable at Harbour Commissioner's Office.

XV. Beacon paid for from pilotage.

XVI. No income. Expenditure, 125*l.* in year ended 31st March 1852; 80*l.* in year 31st March 1858.

XVII. None.

XVIII. None.

XIX. By pilotmaster. Some of the dates were:—1857, 15th April, 9th July, 16th, 23d, 26th September, 8th November; 1858, 23d March, 25th July, 4th and 11th August.

XX. The pilotmaster's assistant, stationed at Passage, lives within view of the beacon.

XXI. Public notice, when deemed requisite; but in general a removal is at once known among the pilots.

XXII. Inside Passage there is a contractor; outside Passage there might be a short delay.

XXIII. The pilotmaster at once communicates to the secretary of the Harbour Board.

XXIV. Nil.

XXV. None.

XXVI. None.

XXVII. None.

Ballast Office, Waterford,
23rd December 1859.

SIR,
Your letter of the 14th instant did not arrive here until this day. I now return, marked with a few corrections of technical character, the proof it enclosed.

I beg to take this opportunity of stating that the Waterford Harbour Commissioners are procuring three of the Dublin keel buoys, to be placed on the bar of this harbour, in lieu of the buoys which Captain Ryder and Mr. Graves saw there on the 19th of September last; and to hand, at next page, resolutions of the Waterford Harbour Commissioners upon two matters which Captain Ryder and Mr. Graves will recollect to have been discussed in their presence.

These resolutions have been forwarded by the port of Dublin Corporation to the Board of Trade.

I have, &c.,

JOHN FARRELL,
Secretary, Waterford Harbour Commissioners.

J. F. Campbell, Esq.,
&c. &c.

At a meeting of the Commissioners for Improving the Port and Harbour of Waterford, held 9th November 1859, it was resolved,—

We consider that the navigation of this harbour would be facilitated and rendered more safe by the erection and maintenance of a small lighthouse on the Spit of Passage, and we earnestly request that the Corporation for Preserving and Improving the Port of Dublin will take early measures for the carrying out of the work we now recommend.

Resolved,—

We respectfully suggest to the Corporation for Improving and Preserving the Port of Dublin, that the approach to Waterford Harbour would be rendered safer to mariners by the erection of a beacon, tower, or pillar on Foilskirt Rock, situated a little to the westward of the harbour's mouth, and we request the corporation will take early steps for the building of such beacon.

SIR, Ballast Office, Waterford, 20th April 1860.

I BEG to state, for the information of the Royal Commissioners of Inquiry, that the Waterford Harbour Commissioners are now placing three of the Dublin patent keel buoys on the bar of this harbour, and that the buoys would have been in position some weeks since but for the continued prevalence of tempestuous weather. The work is to be completed during the next week.

The buoys are of the size to stand 7½ feet over the surface.

I have, &c.

JOHN FARRELL,
Secretary, Waterford Harbour Commissioners.

SIR, Ballast Office, Waterford, 26th May 1860.

THE three keel buoys referred to in a letter I had the honour to address to you on the 20th ult. are now in position on the "Bar Shoals" of this harbour, and are found much to facilitate navigation.

I remain, &c.

JOHN FARRELL,
Secretary, Waterford Harbour Commissioners.

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17. WATERFORD.

BUOYS AND BEACONS.

Circular V.

I. The Commissioners for Improving the Port and Harbour of Waterford.

II. No. 1. sent herewith, gives buoys, beacons, &c., below or to seaward of Passage; and No. 2 gives those above Passage. In 1852 and 1858 the former cost about 3*l.* each buoy per annum, and the latter about 5*l.* 10*s.* per annum for the entire number. There is no income derived from them. At Waterford City there are half a dozen warping buoys which are considered excluded from the present inquiry.

III. Not responsible.

IV. None.

V. There seems no occasion for a sketch, as the buoys are of the ordinary nun and can shapes, averaging 8 feet in length and 4 feet in diameter at widest part.

a. Iron.

b. 20*l.*

c. 10*s.*

d. 2*l.* 10*s.*

e. Fifteen inside Passage and seven outside.

f. Two or three.

g. Generally at Waterford.

h. Two or three.

i. Probably two or three.

j. Generally by a vessel coming foul.

k. Chain and anchor, or chain and heavy stone in shoal water; one buoy moored to a rock.

l. About 6*l.* for a mushroom anchor, and the ordinary price of such chain.

m. Not by tender.

n. Colour.

o. Twenty-two, exclusive of warping buoys at Waterford City.

IV. Nun shape.

VII. Outside Passage, once a year; inside, two or three times a year, overhaul, repair, colouring, &c. take place.

VIII. When the buoys are found, at overhaul, to be worn out, they are condemned and new procured.

IX. In this harbour only one beacon.

X.

a. Beacon at spit or point of Strand at Passage, marked "Perch" on No. 1 Chart, sent herewith.

b. Unknown.

c. To warn from Passage strand, &c., covered at high water.

d. It shows high above highest tide.

e. A pole, 35 feet high, with barrel on top; both of wood.

f. Black.

g. No.

h. Twenty-five feet.

i. About 7*l.*

j. 1858, 28*s.*; 1852, nil.

k. Nil.

XI. None.

XII. None.

XIII. None.

WATERFORD.

WATERFORD.

WATERFORD.

Visited the bar to inspect the buoys. The buoys are too small, and, being made on a bad principle, do not float upright, and are therefore less conspicuous; the birds, owing to the shape of the buoys, are able to sit on them, and they become white in consequence.

There being only one set of buoys, sites are left unoccupied for three or four weeks, while the buoys are absent being painted, as was the case with the buoy on the middle bank when we visited it. There is a buoy on each side of the deep water on the bar, and a buoy on the patch in the middle, but this buoy is coloured red like the west buoy, which is very objectionable.

The placing the harbour buoys is let out by contract, and is taken by Captain Bartlett (who commands a passenger steambot) for 30*l*. The duty and responsibility rests with the master pilot, who resides at Dunmore, but he does not consider it necessary to superintend. Captain Bartlett places the buoys as he deems best; and as he weighs the moorings each time, the positions cannot be accurately maintained. Captain Bartlett appeared to be well acquainted with the pilotage.

The deepest channel is to the eastward of the leading mark given in the Sailing Directions—"the two Duncannon lighthouses in one." The master pilot, Mr. Cann, who selected the sites for the lighthouses many years since, so placed them to keep ships to windward with a westerly wind. There is a growing local opinion that the inner lighthouse should be shifted so as to lead vessels up the deepest channel, as vessels occasionally touch on the bar with present marks. If the bar is deepened in accordance with the recommendation of the Harbour of Refuge Commission (at a cost of 50,000*l*.), the lighthouse question will require careful consideration, and might possibly involve the necessity of altering the site of the upper lighthouse. The dredging away a spit on the eastward side of the bar appears to be the favourite project among practical men. There are numerous buoys above Passage, between it and Waterford; they answer the purpose very well, and appear to be sufficient in number; they are coloured red and black, red on port side, &c.

Attended a meeting of the Harbour Commissioners and others interested in trade of port, and made various suggestions, which were well received. We suggested that there should be—

1. A duplicate set of buoys, painted and ready to place out.
2. An improved style of buoy for the bar, to float upright; to be either Herbert's, ninepin, or keel buoy, and the centre buoy to be chequered.
3. Pilot master to attend when buoys are laid down.

A general opinion was expressed by the Harbour Commissioners that,—

1. A beacon should be placed on Falskirt Rock.
2. That Hook lighthouse should be coloured. (This has since been done in red and white horizontal bands.)
3. That a half-tide signal at Hook would be advantageous; and an improved fog signal there.
4. That a light at Passage Spit, now most imperfectly perched, to lead vessels to safe anchorage would be very useful; and two lights between Passage and Waterford would be useful for steamers trading to Waterford.

A. P. RYDER.
S. R. GRAVES.

LLOYD'S EVIDENCE.

- I. Josiah Williams, agent for Lloyd's, Waterford.
- II. WATERFORD.
- III. Trinity House for lights, Waterford Harbour Commissioners for buoys and beacons.
- IV. There are complaints of the want of a lighthouse on the Spit of Papoge and also of the want of a beacon on the Foilshi Rock to the westward of the har-

bour, and an application has been made by the Waterford Harbour Commissioners to the Ballast Board in Dublin to supply both these requirements, and a favourable answer having been received, it is expected that the applications will be complied with. Both appear to be essential to the safety of vessels resorting to this port.

- V. I have heard no complaint of the colour or position of the buoys, they are placed under the direction of the pilot master, a very vigilant and active officer who constantly inspects them.
- VI. As stated in reply to question No. IV. A Lighthouse on the Spit below Papoge and a beacon on the Foilshi Rock to the westward, covered at high water both of which I am convinced are much needed.
- VII. Oil.
- VIII. I have never heard that the lights have been accidentally extinguished, and I believe that they have been always carefully attended by the parties in charge.
- IX. A buoy occasionally gets out of place by the strength of the tide, but the pilot master gets it speedily restored to its right position.
- X. I have known both steamers and sailing vessels to get a shore on the Spit of Papoge which I attributed to the want of a lighthouse.
- XI. Masters of vessels complain of the position of the two lighthouses at Duncannon.
- XII. A bell at the Hook Tower at the entrance of the harbour, but is complained of as not being heard at a sufficient distance.
- XIII. Inward bound, black buoy on starboard and red buoy on port.
- XIV. No.
- XV. None, except tonnage duty levied by the Waterford Harbour Commissioners, and water bailiffs dues by the town council.
- XVI. I have heard the fog bell at Hook Tower complained as not being sufficiently loud.
- XVII. I believe I have indicated the opinion of mariners frequenting the port, in the replies to the foregoing questions.
- XVIII. No complaints.
- XIX. With strict integrity.
- XX. The general opinions I think may be fairly inferred from the foregoing replies.

- I. Michael James Burns, steamship Gipsy; John Coffey, steamship Vesta; William Davis, steamer Jumna; Henry Jay, steamship Brenda.
- II. WATERFORD, IRELAND.
- III. Trinity for lights, Waterford Harbour Commissioners, buoys and beacons.
- IV. No.
- V. Colour and position of buoys right; the bar buoys, and up to passage too small, and lay on their side.
- VI. A light on south-east point of Passage Spit, to avoid the shoals thereabout.
- VII. Do not know.
- VIII. We do not know of any.
- IX. Buoys frequently out of place, but know of no accidents occurring in consequence.
- X. For want of a light on Passage Spit two steamers went on shore there to our knowledge.
- XI. At Duncannon lower lighthouse a tidal light is exhibited from half flood till half ebb, but both lights appear as one outside the bar, in consequence of being too close together, and we would recommend an alteration.
- XII. A bell at Hook Lighthouse, but not sufficiently strong to warn ships from approaching danger.
- XIII. Inward bound, black nun buoys on starboard, and red can on port hand.
- XIV. No.
- XV. None, except harbour dues.
- XVI. Want of fog bell complained of in 1854 at Hook Lighthouse.
- XVII. Sufficient.
- XVIII. No complaints.
- XIX. Yes.
- XX. No.

18. WESTPORT.

BUOYS AND BEACONS.

- I. Westport Port and Harbour Commissioners.
 II. No buoys or beacons under the management of the authority. There is one buoy and one beacon outside the limits of the Westport Harbour, under the management of the Ballast Office, Dublin. There are several perches within the limits of this authority to point out the channel leading to the quay, which dries at low water, and three small buoys for working vessels to and from the quay.

19. WEXFORD.

BUOYS AND BEACONS.

- I. Matthew McCann, Harbour Master, Monck Street, Wexford.
 II. A chart annexed showing the position and number of buoys and perches in the harbour of Wexford. The cost is about 10*l.* per year for the expense thereof, 14 buoys and 4 perches, no income derived, income derived from vessels, pay all charges on their respective tonnage per register.
 III. Responsible to the Harbour Commissioners.
 IV. No other authority that I know of.
 V. See sketch.

- a.* Red pine and iron hoops stroped with iron.
b. Buoy chain and mooring stone, about 10*l.*
c. Is about 10*s.* per year.
d. Is about 5*s.* per year.
e. Fourteen buoys and four perches.
f. None in reserve.
g. None.
h. None.
i. None. I take good care to keep the buoys and chains in good order, and repair, so that seldom or never any of them are lost or go astray.
j. By vessels running foul and shifting their position, which is immediately replaced.
k. With chain, and a sufficient stone.
l. They are all moored in 7 feet at low water; the cost is 25*s.* each.
m. By coopers and blacksmiths, for the purpose; no tender.
n. The buoys on the south side of the harbour are all black, on the north side black with red tops, the two fairway buoys black with white tops.
o. Fourteen as before stated.

- VI. All as model annexed.
 VII. They are all taken up, cleaned, and painted, annually, in the month of August.
 VIII. Annually, as above.
 IX. Perches; a Memel spar about 40 feet long with marks on top.
 X. Perches 4.
a. Perch on north side, ditto on south side, perch of Gul Bar, perch of Flats.
c. To guide vessels through the channel.
d. By the marks on top thereof.
e. Memel spar wood, cross pieces, and wood baskets.
f. Black.
g. None lighted by night.
h. About 30 feet.
i. About 5*l.*
j. About 5*s.* per annum.
k. No income, but as before stated.

- XI. To the extent of their use in this locality.
 XII. The buoys which I have the control over are laid down when wanted; I do not think any improvement could be made.
 XIII. Perches, answer as above.
 XIV. From the funds levied on all vessels paid in the harbour office.
 XV. Answer as above.
 XVI. The foregoing replies is an answer to this question.
 XVII. There has been no application made within those periods, nor is there any wanted.
 XVIII. The proper authority would be the Harbour Commissioners, who never refuse any such request or application.
 XIX. By Mr. Matthew McCann, harbour master; in August of each and every year.

WEXFORD.

- XX. The same answer as before.
 XXI. They are replaced immediately or as soon as possible.
 XXII. I always do so myself immediately.
 XXIII. Notify the Harbour Commissioners, who meet weekly.
 XXIV. None.

- a.* Stone and chain.
b. Red pine.
c. Conical.
d. Five feet.
e. Black ditto and red ditto, and white.
f. No complaints.
g. Inform Harbour Commissioners.
h. All vessels coming in with cargo and going out with same, 5*d.* per registered ton; pilotage 5*d.* per ditto.
i. None exacted.
j. Paid in harbour office.
k. To guide vessels into the right channel.
l. Confusion, and put vessels astray.
m. As little delay as possible.
 None needed.

XXV. Formerly iron buoys were tried but not approved; the present shape and material is best adapted for our purpose.

XXVI. You are to inspect all buoys and perches, and keep them in good order, cleaned, and painted, as often as required.

SIR, Wexford, December 24, 1859.
 That steam vessels trading to this port pay but half pilotage on their registered tonnage; wind-bound vessels, put in by stress of weather, or otherwise, pay 2*d.* per register tonnage; pilotage steam vessels 1*d.* per ton, ditto.

There was on the 16th instant, a Royal Commission here, presided over by Capt. Ryder, R.N., I believe, was the gentleman's name, when there was some fault found with the Bar buoys and those on the adjacent banks, over which I have no control; they are in charge of the pilot master, who resides at the Forth of Roslarc; he, also, got one of your papers to answer the questions therein, but, I believe, he did not send the answers.

I am, &c.

MATTHEW MCCANN.

Harbour Master, Monck Street, Wexford.

J. F. Campbell, Esq.
 &c. &c.

Commander Partridge, of the Coast Guard, attended, and several shipowners, pilots, &c.

Dissatisfaction was expressed with regard to the Blackwater floating lights. The lower light was stated to be only 20 feet above the water, and, therefore, not seen early enough. The upper light is a flash light, 45 feet high. It was thought that the light would be more easily identified if the upper light was a fixed light instead of a flash.

Mr. Francis Harper, Lloyd's agent, thinks light-vessels generally, Blackwater and Arklow in particular, would be more useful to ships working up the channel if they were off the middle of the bank instead of marking one end, but admitted that for vessels passing between the banks, their present position was preferable.

Mr. Allen, shipowner, and Captain Clark, suggest that for ships bound to Wexford from the southward it would be a great assistance if the passage near Carriek Head was lighted.

James Blake, pilot and master of tug, thinks Blackwater light should be off middle of bank; thinks light should be changed to fixed; thinks there should be a low light, not more than 20 feet above water at Carriek Head.

There are no lights at entrance of Wexford Harbour. There is a general opinion that the entrance ought to be lighted. The delay for daylight is most inconvenient, and often dangerous. After entering the harbour two small pile lights would be sufficient to conduct vessels to within sight of the town lights. The purchase of a tug has strengthened the desire for entrance lights.

All the buoys at the entrance belong to Harbour Commissioners. They are wooden-cask buoys, and often wash away. The master pilot who lives at

WEXFORD.

the castle has charge of the buoys. All think the buoys should be larger, and one of the outermost buoys (probably the southern buoy), a bell buoy for fogs.

A general opinion was expressed that the banks at the entrance shifted, and that the buoys had ceased accurately to mark the shoals; but this was indignantly denied by the master pilot. It was stated that it had been found impossible to weigh the sinker, and, therefore, when a buoy was shifted the sinker and part of the chain were lost. He states that a day-tide signal is shown at outer fort.

ALFRED P. RYDER.

LLOYD'S EVIDENCE.

I. Francis Harper, Merchant, Wexford, and Agent to Lloyd's Liverpool and Glasgow Underwriters.

II. WEXFORD and coast near it.

III. Wexford Harbour Commissioners provide buoys, &c., for the harbour and bars. The Dublin Ballast Board provide buoys for Blackwater Bank, the Long Bank, and Splaugh Rock, and entrance into South Bay, with wreck buoys occasionally.

IV. I am of opinion that a small lightvessel inside the entrance into the south bay, that would only show light five or six miles, would be very useful for vessels at night to run into the south bay for shelter, the passage is narrow but good; the only guide now is Tuskar, being a stern light, and sometimes not easily seen, is not considered good.

V. I cannot suggest any change in the buoys about this place, but it is beyond any doubt that some vessels have mistaken the light, now two years, on Blackwater Bank for Tuskar, and ran on shore in one case, and others on the bank and lost. The flash light is so much like Tuskar, and the standing light very low; is not easily made out in some weather; the ship is placed outside the north end of the bank. Many are of opinion if she was outside the middle of the bank she would be a better protection. It is my opinion that a steady fixed light to be the best so near Tuskar, and the flash light where the Arklow light is. I also think the Arklow lightship would render more protection if placed inside the bank, near the middle of it. She is at the south end, on a range with the inside of the bank; the coasting vessels do not so much require her guidance as ships working down the channel with contrary winds.

VII. Oil, as far as I know.

VIII. I am not aware of any defect.

IX. I have known some of the Wexford Bar buoys having broken away from chain bearing, but are replaced as soon as possible. The Dublin Ballast office buoys are well attended to, and replaced in case of accident. I am not aware of any accident happening in consequence of buoys being carried away.

X. I cannot say that any accident happened for want of guides when they could be useful.

XI. The Wexford Bar pilots use signals occasionally for their own information in bringing in vessels at proper times of tide.

XII. I cannot say when such would be useful in this locality.

XIII. The harbour buoys on one side of the channel is black, red on the other, and leading buoys, in the middle, black and white; the outside buoys are all black, some distinguished by a staff on them.

XIV. I do not see any occasion to change.

XV. None.

XVI. I cannot say that any complaint was made to parties on any buoys, &c.

XVII. No complaint can be made in this case, the general lights only are paid.

XIX. I think so.

XX. I am not aware of any opinion to the prejudice of the managers of lights or buoys in and about this locality.

VI. I. Edmund Roach, King Street, Wexford, Master of the "Troubadour" steamer, trading between Wexford and Liverpool.

WEXFORD and YOUGHAL.

II. WEXFORD HARBOUR and its Approaches.

III. For the bays and banks the Ballast office of Dublin; for Wexford Bars and Harbour, the Wexford Harbour Commissioners.

IV. I do not.

V. The northern entrance is commonly called the North Sheer. The north-east buoy of the Dogger Bank is much too small. The south buoy of the Dogger bank ought to be a bell buoy, as it is the only guide in thick weather to get into the bay, or at night time, and if the Blackwater ship was on the middle of the bank it would be a guide, and would answer all purposes better than at present.

VI. The south entrance or south shore. There should be a lightship on the south end of the Long Bank, or a light on the Carrig Rocks, as at present the only guide to come in from the south is a stern beamer of the Tuskar Light which you will loose before you get into the narrows if the weather is the least hazy, and as the tide runs from three or four knots across the entrance, and if the tide is going to the northward, you are liable to be set on the Long Bank, or, as it is commonly called, Holden's Bed, and if setting to the southward you are liable to be set on the Carrig Rocks.

VII. Not aware.

VIII. Not aware.

IX. Frazer's buoy is out of place.

X. I consider that all the accidents that have happened, which are numerous, and many losses that are not heard of, emanated from the want of necessary lights and buoys on this part of the coast, as the buoys that are now there are too small, and cannot be seen any distance.

XI. There is no tide signals at present used, but there are two lights required at the point of the Haven to be lighted, two hours before, and one after high water, as a guide in over the Huntoon Bar; also a tide light on the Flats and Gull Bar. The above would enable steamers to go out at night time to assist vessels that would get on the banks outside, as in case of the "Pomona."

XII. Not used.

XIII. Red on the north, black on the south, and white in the fair way, all of the same shape, but entirely too small, as they cannot be seen until alongside of them.

XIV. I would recommend that much larger buoys, and one side of the channel to have beacons or perches on them to distinguish the side you are on.

XV. None.

XVI. I spoke to many of the Harbour Commissioners as to the necessity of getting larger buoys, and to have beacons on them at one side of the channel.

XVII. They are all of the same opinion as I am, and the oldest and most experienced men in the Wexford trade is afraid to run into the bay at night-time, when, if there was a proper guide into the bay, it would cause many vessels to run in for shelter from gales of wind from north to south, as when once in could ride in safety.

XIX. I believe so.

XX. Cannot answer.

20. YOUGHAL.

BUOYS AND BEACONS.

YOUGHAL.

Circular V.

I BEG to make the following return and replies, on behalf of the Town Commissioners of Youghal, to the annexed printed queries issued by the Royal Commissioners for Lights, Buoys, and Beacons.

Reply to First Query.—The Youghal Commissioners may be properly styled as follows, viz.:—The Commissioners of the Town and Borough of Youghal, elected under the provisions of the Act of the 9th George the Fourth, chapter 82, and also acting in and for said town and borough in execution of the Act of the 3d and 4th Victoria, chapter 108, entitled, "An Act for the Regulation of Municipal Corporations in Ireland." The latter Act transferred to the Commissioners all property and emoluments of the late corporation of Youghal, including harbour dues, and various powers and rights over the port and harbour, conferred on the corporation by very ancient charters from the crown, and subsequently confirmed by several successive charters from different sovereigns.

Youghal.
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In reply to all the numbers from II. to XVI. inclusive, and from XIX. to XXVII. inclusive, it will be sufficient to state that there has not been for many years a single buoy in or near the harbour of Youghal, though many wrecks and heavy losses have occurred for want of them.

In reference to numbers XVII. and XVIII. on the annexed paper, I beg to send herewith a copy of a memorial presented by the Youghal Commissioners to the Board of Admiralty in December 1858, chiefly in relation to the removal or deepening of the Youghal Bar, the reply to which was that the proposed improvement though important would be too expensive. I also send herewith a copy of the memorial lately forwarded by the Youghal pilots and masters and owners of vessels to the present Commissioners for Lights, Buoys, and Beacons.

Any further information will be gladly furnished by the Youghal Commissioners on application.

JEREMIAH HODNETT,

Solicitor.

Youghal, 4th November 1859. Town Clerk, Youghal.

To the Honourable the Commissioners appointed by Her Majesty to inquire into the Condition and Management of Lights, Buoys, and Beacons.

THE MEMORIAL OF THE PILOTS AND OWNERS AND MASTERS OF VESSELS OF THE TOWN OF YOUGHAL, in the County of Cork.

RESPECTFULLY SHEWETH,

That Youghal Bar runs from the eastern point of the harbour, south-west by west, across the entrance to the harbour, and has two channels—the eastern and western channels, and a shoal and dangerous ledge of rock called “The Rock of the Bar;” and that there are two other rocks which render the navigation there dangerous, namely, the Rock of Blackball to the eastward of the eastern channel, and the rock of Capel Island Sound, and also a shoal, called “The Dutchman’s Ballast,” inside the bar, where several vessels have been wrecked, and that it would be of the greatest advantage to the navigation of this harbour to buoy these several channels, rocks, and shoals:

That a red light, to be shown at night at the Youghal lighthouse from half flood to half ebb, and a beacon in the daytime, would also be of great service to the navigation, and would contribute much to the security of shipping, and that it would be also most desirable that efficient pilotage should be secured, and branch pilots appointed for the harbour.

Memorialists therefore respectfully pray that you may be pleased to direct or recommend the improvements in this Memorial mentioned.

To the Honourable Her Majesty’s Board of Admiralty.

THE MEMORIAL OF THE COMMISSIONERS OF THE TOWN OF YOUGHAL, in the County of Cork, elected under the Act of the 9th year of King George the Fourth, chapter 82, and also acting for said town in execution of the Act for the Regulation of Municipal Corporations in Ireland.

RESPECTFULLY SHEWETH,

That the situation of the said town of Youghal at the mouth of the Blackwater, a large navigable river, and within half a mile of the open sea, is most favourable for commerce, and not only in remote times, but even within the memory of the present generation, the said town held a high rank among the sea-ports of Ireland, both as regards the extent of its trade, and also in other respects, and was in past times one of the principal ports of embarkation in the south of Ireland:

That from the position of the harbour of Youghal on the south-eastern coast of Ireland, within easy reach of vessels navigating between America and some of the principal ports of the United Kingdom, and also of a large proportion of the vessels engaged in the coasting trade between Great Britain and Ireland, it is most desirable that same should be rendered available as a harbour of refuge:

That there has formed outside the said harbour, and close to the entrance thereof, a bar, which is not only greatly injurious to the commerce of the town, but also renders the harbour generally inaccessible to vessels in distress:

That the said harbour affords secure anchorage in deep water for a large number of vessels, and the river Blackwater, although altogether unimproved by art, is navigable to vessels of considerable size to a distance of sixteen miles inland through a fertile and populous country, and is capable of being rendered navigable to large river craft to

YOUGHAL.

a much greater distance; but these rare natural advantages are in a great degree neutralized by the injurious effect of the said bar, which obstructs navigation from said harbour seaward:

That the said harbour with the vessels at anchor therein, are within view of navigators sailing along the coast, and frequently vessels are seen in distress and in extreme danger in the Bay of Youghal, which might easily find refuge and safety in said harbour were it not for the obstruction offered by the said bar, and many instances have occurred of vessels attempting to enter said harbour being totally wrecked on the bar with great loss of life and property:

That there exist two channels or partial openings in the said bar, the larger and more generally used of which, (called the eastern channel) is practicable to vessels of about 600 tons burthen from about three quarters flood to one quarter ebb tide, but such channels are too shoal and too narrow to permit the capabilities of the town and harbour being availed of or developed to any considerable extent:

That the said eastern channel could be deepened and widened and buoyed at a comparatively trifling expense, and thereby a greatly increased trade, and consequent prosperity, would be ensured to this ancient borough town of Youghal,—the improvement of the extensive and beautiful district of country bordering the Blackwater would be greatly stimulated, and many lives and much property would be saved from destruction by shipwreck.

Memorialists therefore respectfully pray that your Honourable Board may be pleased to bestow your prompt attention on the subject hereof, and cause to be carried into effect the improvement herein suggested, and Memorialists will ever pray.

SIR, 31st December, 1859.

I AM directed to draw your attention to the statements in the accompanying paper, viz., 1st, in the memorial of the pilots, complaining of the absence of buoys; 2nd, the memorial of the Commissioners of the town of Youghal, remarking on the benefits that would result from buoying the harbour, and petitions the Board of Admiralty to buoy it. And I am directed to request that you will state the amount of harbour dues collected in the years 1857, 1858, 1859; how they have been expended; and whether the buoyage of the approaches of Youghal harbour is not one of the objects of expenditure contemplated by your Act of Parliament.

I am, &c.

J. F. CAMPBELL.

Town Commissioners’ Office, Youghal,

SIR, 27th January, 1860.

I HAVE the honour to acknowledge the receipt of your letter of enclosing copies of the following, viz., Replies to queries proposed by the Royal Commission for Buoys, Lights, and Beacons; memorial of the pilots, owners, and masters of vessels of this port; memorial of the Town Commissioners of Youghal respecting the improvement of this harbour; and requesting to be informed of the amount of harbour dues collected for the years 1857, 1858, and 1859.

In reply, I beg leave to inform you that the harbour dues for the years respectively 1857, 1858, and 1859, are as follows:—

1857 -	- £62
1858 -	- £62
1859 -	- £65
	£189

This sum, together with the other sources of corporate revenue, have been expended in payment of liabilities created for the most part by the late corporation, such as interest, annuities, salaries, head rents, taxes, repairing and manufacturing quays, public ferry ship and boats.

Our Commissioners have, therefore, no funds to be applied to the buoying of the harbour.

I have, &c.

H. BROWN, Secretary.

J. F. Campbell, Esq.,
&c. &c.

LLOYD’S EVIDENCE.

I. James H. Penn, Lloyd’s Agent.

II. YOUGHAL.

III. There are no buoys or beacons in this harbour; the lights are under the control of Trinity Board.

IV. Well lighted, but no buoys.

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YOUGHAL.

- V. There are no buoys or beacons, the lighthouse good, but a tide light is requisite.
- VI. Buoys to be placed, two each, on east and west channels, and one on Rock of Bar; also one on the harbour on Dutchman's Ballast.
- VII. Oil in Youghal.
- VIII. Never heard of any.
- IX. No buoys.
- X. The Galatea, barque, was wrecked on the bar, and, had there been buoys, may have had a chance of being saved.
- XI. Tide lights are wanted; black ball by day, red light by night, two hours before high water one hour after.
- XII. Do not think them requisite.
- XIII. No buoys.
- XIV. No buoys.
- XV. Dues are on lights, which are paid to the Custom House.
- XVI. No complaint.
- XVII. The captains say that buoys and beacons are requisite.
- XVIII. Not excessive.
- XIX. The dues are collected by the Comptroller of Customs.
- XX. Not aware of any.

YOUGHAL.

- VI. I believe there is no other light necessary; some buoys judiciously laid down, I think, would be very useful on the east and west extremities of the bar.
- VII. Oil.
- VIII. I am not aware of any accident occurring to the lights or want of attention, nor am I aware of any accident having taken place on that account.
- IX. I am not aware of any buoys being laid down connected with this harbour at any time.
- X. I am not aware of any.
- XI. There are no tide signals, and I believe none are wanting.
- XII. I believe none are required.
- XIII. There are none.
- XIV. None.
- XV. To the Collector of Customs local light only.
- XVI. I am not aware of any.
- XVII. I believe favourable.
- XVIII. I believe the general feeling to be that the local dues, lights, &c., are very moderate, except ballast.
- XIX. The local dues, &c., are contracted for by the highest bidder to the Town Commissioners, and expended by them generally for all local purposes connected with the town.
- XX. The general opinion is that the light is well managed; there are no buoys or beacons.

YOUGHAL.

Circular VI.

- I. John M'Carthy, master mariner, shipowner, 42, South Main Street, Youghal.
- II. YOUGHAL, in the County of CORK.
- III. One harbour light in the hands of the Trinity House, Dublin; there are no buoys or beacons in the harbour, nor on the bar or channel.
- IV. The coast and all about this place is well lighted; the harbour and bar wants to be buoyed and beacons.
- V. There can be no improvement in my opinion in the present harbour light; there are no buoys or beacons here about the harbour.
- VI. A tide light would be very much wanted, showing from the present lighthouse from half flood to half ebb of a red colour, as vessels have been lost on this bar for want of the same from time to time.
- VII. Oil at this port.
- VIII. I did not hear or know of any neglect in or about this place.
- IX. No buoys here.
- X. Many, from time to time of life and property.
- XI. No tide signals here; from a mast erected by the present lighthouse a flag or ball hoisted by day to denote the time of tide would be very much wanted.
- XII. A bell or gong to be sounded at the lighthouse, showing the state of tide when the tide signals could not be seen.
- XIII. No buoys here.
- XIV. No buoys here.
- XV. Heard of no complaint.
- XVII. A general complaint of a tide light, of buoys and beacons wanted.
- XIX. The local dues are in the hands of the Town Commissioners; cannot tell how they are applied.
- XX. Heard of no complaint about this harbour light.

- I. John H. Edwards, master mariner.
- II. YOUGHAL.
- III. As there are no buoys in or near the harbour, the light is under the control of the Trinity Board.
- IV. I consider that buoys are requisite, and that there should also be a tide light for the harbour.
- V. There are no buoys, and tide light is necessary.
- VI. One on the rock of the bar; two on the east, two on the west channels over the bar, and one on a bank in harbour called the Dutchman's Ballast.
- VII. Oil.
- VIII. Not aware of any.
- IX. No buoys.
- X. In consequence of not having buoys there was a vessel lost in 1857, there being sufficient water in the channel at the time.
- XI. A light at night and ball or flag at day while there is ten feet water on the bar.
- XII. I do not think that fog signals are necessary.
- XIII. No buoys.
- XIV. No buoys.
- XV. I am not aware of any complaints.
- XVII. A tide light and buoys are required.
- XVIII. That the charges are moderate.
- XIX. They are collected by the custom house authorities.
- XX. Not aware of any.

Circular VI.

Mr. Pim, a merchant, and Thomas Sullivan, pilot, attended. Ascertained that there are no buoys, and by Commissioners. (see petition). To their absence the pilots attribute the unpopularity of the port.

The pilots state that the buoys wanted are—a

- Buoy on the patch;
- „ rock;
- „ rock on sound inside Cable Island;
- „ in the channel.

A harbour half-tide red light shown in the Youghal lighthouse would be a great benefit.

It was stated that the harbour dues, amounting to about 120*l.* or 130*l.*, are farmed out for 70*l.*, none of which is expended on buoyage.

Visited the Youghal Harbour light on our arrival at 10 p.m. (See Lighthouse descriptions.)

APPENDIX TO LOCAL AUTHORITIES.

The following information relative to lights, &c., under Local Authorities, was received too late for insertion at the proper places.

October, 1860.

WHITBY.
Circular III.

79. ENGLAND—WHITBY.

LIGHTHOUSES.—GENERAL RETURN.

- I. Trustees of the piers and harbour of Whitby.
- II. Two lighthouses, one on each pier head.
- V. Fixed lights.
- VII. Fixed; red and green as distinguishing lights.
- IX. Argand burners; Gas parabolic reflectors.
- XI. No stores kept.
- XII. No fog signals supplied to Whitby tide lighthouse.
- XIII. No code of tide signals used.
- XV. Yearly expenditure about *l.*

LIGHTHOUSE.—SPECIAL RETURN.

- I. Harbour lights, Whitby.
- II. Trustees of the piers and harbour of Whitby.
- III. Trustees of the piers and harbour of Whitby.
- IV. Two lighthouses apart, about 200 feet.
- V. 1831.
- VI. Trustees, &c.
- VII. As tide lights.
- VIII. 1831 and 1854.
- IX. Francis Pickernell. Not by contract.
- X. Harbour lights.
- XI. Stone solid wall. Natural stone colour.
- XII. No lightning conductor.
- XIII. About 80 feet.
- XIV. 83 feet above the medium level.
- XV. 15 nautical miles.
- XVI. 18 nautical miles.
- XVII. From N.W. to S.E.
- XVIII. Fixed; green and red.
- XIX. Fixed.
- XX. Two hours before and two hours after high water.
- XXI. Parabolic reflectors.
- XXII. Four in each lighthouse.
- XXIII. Altered from white to green and red by suggestion of Trinity Board, London.
- XXIV. Messrs. Robinson and Wilkins, London.
- XXV. By opening the lighthouse roof.
- XXVI. None.
- XXVII. None.
- XXVIII. None noted.
- XXIX. No record of cost.
- XXX. Finished.
- XXXI. No record.

- XXXII. Not purchased.
- XXXIII. No record.
- XXXIV. No record.
- XXXV. Two keepers. Salary for both.
- XXXVI. No record.
- XXXVII. No record.
- XXXVIII. None used.
- XXXIX. None used.
- XL. None used.
- XLI. None used.
- XLII. From the pier and harbour fund.
- XLIII. From pier and harbour fund.
- XLIV. No record.
- XLV. No complaints.
- XLVI. None.
- XLVII. None.
- XLVIII. None.
- XLIX. None.
- L. No inspection.
- LI. None.
- LII. Gas burners are renewed when necessary.
- LIV. None used.
- LV. By day from ensign staff on the west cliff, by flag.
- LVI. None used.
- LVII. One keeper for each lighthouse.
- LVIII. Left to the harbour master.

GRANTON.

GRAN
Circular

Harbour Master's Office,
Granton, Edinburgh,
13th Sept., 1860.

Sir,

I beg to acknowledge the receipt of your letter of the 1st May, enclosing forms to be filled up with regard to lights, buoys, and beacons. I respectfully beg to inform you, that the only light here is the harbour light on the end of the pier. It is lighted with gas; shows red, being glazed with red coloured glass; seen about four miles off, north, east, and west; is only intended at present as a guide for the harbour. There are also smaller lights on the breakwaters for the same purpose. There are no buoys or beacons in the vicinity of the harbour. I have returned the forms, and remain,

Sir, your obedient servant,

THOMAS S. WEYSS,
Harbour Master.

J. F. Campbell, Esq.,
Secretary, Royal Commissioners,
Lights, Buoys, and Beacons.

I am very sorry this was not attended to sooner, but by some mischance your letter got mislaid.

T. S. W.

List of Local Authorities, or of Lights taken from the Admiralty List of Lights, or of places where Lights, Buoys, or Beacons have been discovered since the returns were printed, or of such places whose names are not mentioned elsewhere in the Appendix. Forms were sent to those marked. The Returns of the General Authorities, the Reports of former Committees, the Map published by the Board of Trade, and other Authorities, have been consulted.*

<i>England.</i>	96. Amlwch.	37. Cellardyke.	52.*St. Andrews.
84. Brighton, visited.	97. Holyhead.	38. Port-on-Craig.	53. Buddonness.
85. Yarmouth, Isle of Wight.	98. Tenby.	39. Newport.	54.*Arbroath.
86. Eastbourne.	99. Pembrey.	40. Latheronwheel.	55.*Macduff.
87. Hastings.	100. Ryde, Isle of Wight,	41. Oban, visited.	56.*Littleferry.
88.*Folkstone, visited.	visited.	42. Ardrishaig.	57.*Campbelltown.
89.*Margate, visited.	101. Herne Bay.	43. Southerness.	
90. Northfleet, separate re-	102. Hope Point.	44. Annan River.	<i>Total.</i>
turn.	103. Harrington.	45.*Fisherraw.	England - - 104
91.*Great Yarmouth.	104. Mumbles (Swansea).	46.*Leith, visited.	Scotland - - 57
92. Bridlington.		47.*Grangemouth.	Ireland - - 20
93. Seaton.	<i>Scotland.</i>	48.*Kirkcaldy.	
94. Whitehaven.	34. Eyemouth.	49.*Buckhaven.	Local Authorities,
95. Walney.	35. Dunbar.	50. Pittenweem.	so far as known 181
	36. St. Monance.	51. Anstruther.	

CIRCULAR NO. VII.

MERCANTILE MARINE.

EVIDENCE OF MERCHANTS, SHIPOWNERS, AGENTS, BROKERS, AND OTHERS CONNECTED WITH THE MERCANTILE MARINE.

1,000 copies of the Questions were issued on the 4th of February, and on the 14th of March 112 returns had been received.

The names were selected from the following lists :

1. Subscribers to Lloyd's.
2. Members of Marine Boards.
3. Delegates from Outports who attended the Shipowners' Meeting, in London in 1858.

The Evidence is thus arranged—

- 1st. An alphabetical list of the names of the witnesses, with an index number attached to each.
- 2nd. All the answers given to each of 13 questions arranged together under each question.
- 3rd. An abstract together with the questions. Page 443.

In order to find the evidence of any particular witness—

- 1st. Search for his name in the list.
 - 2nd. Under the index number there given, and under each question, search for the replies given.
- Where no reply was given by a witness to any particular question, his index number is there omitted.

ALPHABETICAL LIST OF WITNESSES.

A.	F.	M.	S.
1. Adam, Archd.	32. Finnie, Archd.	56. Maine, Robt.	86. Shankland, Robt.
2. Adamson, Wm.	33. Fox, Alfred.	57. Marshall, Geo.	87. Smales, Gidcon.
	34. Francis, Edward.	58. Martin, Jas.	88. Spark, Geo.
B.		59. Martin, Jas.	89. Stewart, Jas.
3. Baikie, J. H.	G.	60. Marwood, Thos.	90. Stevens, Thos.
4. Barnett, Jas.	35. Gilmour, Allan.	61. Menzies, Geo.	91. Stevens, Thos. Jones.
5. Bayley, Wm.	36. Goddard, Ebenezer.	62. Middleton, Wm.	92. Sweet, T. W.
6. Blöte, Wm.	37. Grieve, Jas. J.	63. Milligan, Evans, & Co.	93. Sheil, Richd.
7. Boott, English and Bran-		64. Moffatt, John.	94. Skirling, Chas.
con.		65. Morice, Hartwell.	95. Skirling, Chas., junr.
8. Broad, Robt. Richds.	H.	66. Macgregor, Donald R.	96. Smith, Geo., junr.
9. Bucknall, A. Red.	38. Hamlin, Thos.	67. McNeill, M.	97. Skibley, John.
10. Bhundell, Hv.	39. Harris, Julian B.	68. Mc Callum, Colin.	98. Sully, Geo. B.
11. Burnett, Geo.	40. Henderson, Thos.		T.
12. Bautoft, Wm.	41. Henderson, Thos. Hood.	N.	99. Thompson, E. D.
	42. Hill, Laurence.	70. Napier, R.	100. Thompson, Jos. L.
C.	43. Hill, Geo. Hy.		101. Trowsdall, Jas.
13. Charleton, John.	44. Hill, Richd.	O.	
14. Collier, William.	45. Holman, John.	71. Orange, Geo.	W.
15. Cook, John.	46. Hooper, Hy.	72. Orr, Jas.	102. Walker, F. B.
16. Collin, W. F.	47. Horé, James.		103. Ward, Thos.
17. Cory, Richd., junr.	48. Hudson, R. M.	P.	104. Welch, Geo.
18. Crozier, Wm.	49. Hunter, Thos. Olopt.	73. Peake, Thos.	105. Wilkinson, Geo.
19. Cuckow, Jas.		74. Peacock, Bligh.	106. Wilkinson, Geo. (dead).
20. Cuning, W. B.		75. Pim, Jas. E.	107. Wilson, Nathl.
D.	I.	76. Phillips, John S.	108. Wishart, John Kay.
21. Davey, J. W.	50. Inman, Wm.	77. Phillipps, Wm.	109. Wright, Wm.
22. Dawson, Thos.		78. Priest, Wm.	110. Worries, H.
23. Deani, Alex.	J.	79. Porter, Frank T.	
24. Denny, Peter.	51. Jackson, John.	80. Prowse, Joshua.	Y.
25. De Patron, Jno. A.	52. Jones, Matthew.		111. Yettles, Jas.
26. De St. Croix, Philip.		R.	112. Yellary, Robt. E.
27. Dryden, John.		81. Ritchie, Archd.	113. York, Geo.
28. Duncan, Geo.		82. Riches, Chas. Jos.	114. Young, Geo. Fredk.
29. Dunn, Chas.		83. Riley, John.	
E.	L.	84. Robison, John.	
30. Edward, Allan.	53. Laing, Joseph.	85. Rose, Wm.	
31. Edwards, John.	54. Leslie, Geo.		
	55. Lindsey, M.		

LIST OF WITNESSES.

1. Have the goodness to write your Name, state your Occupation, and give your Address.

2. If your evidence is intended to apply to any one particular locality, here write the name of the Port, Place, or District to which your answers refer.

1. ARCHIBALD ADAM, Shipowner, Hamilton and Adam.—Frith of Clyde.
2. SIR,—I have received your official communication, addressed to my offices in Newcastle-upon-Tyne, but as I am quite unacquainted with the subject of lights, buoys, &c., I cannot answer the interrogatories put. In my village (Cullercoats), it is only a fishing place, and the only lights, buoys, &c., are for the aid and guidance of our resident fishermen and others during the herring-fishing season.—I am, &c., WILLIAM ADAMSON.—Garden House, Cullercoats, near Tynemouth, Northumberland, 8th July 1860.
3. J. H. BAIKIE, Agent for Lloyd's, Shipowner and Shipbroker, Kirkwall, Orkney.—Orkney Islands.
4. JAS. BARNETT, Merchant and Shipowner, Belfast.—Belfast.
5. W. BAYLEY, Shipbuilder and Shipowner, Ipswich, of the firm of W. Bayley and Sons.—Port of Ipswich, and River Orwell.
6. WILLIAM BLAKE, Shipowner, Brixham, Devon.—No particular place.
7. BOULT, ENGLISH, and BRANDON, Ship Agents and Brokers.—Liverpool.
8. ROBERT RICHARDS BROAD, Principal of the Firm of Wm. Broad and Sons, Merchants, Lloyd's Agents, &c. Falmouth.—Port of Falmouth.
9. ALFRED BUCKWELL, Timber Merchant and Shipowner, 18, Egremont Place, Brighton.—Port of Shoreham.
10. HENRY BLUNDELL, Paint, Colour, and Varnish Manufacturer, Seed Crusher, and Oil Refiner, Kingston-upon-Hull.—Port of Kingston-upon-Hull.
11. FIRM, GEORGE BURNETT and Co., Merchants, Dundee; individual address, GEORGE BURNETT, Dundee, formerly 15 years in the merchant service.—Locally, to Dundee and River Tay; and generally, to the whole country.
12. MR. E. Goddard, chairman of our Maritime Insurance Committee, of which I am a member, will reply to these several questions, as far as he is able to do so.—WM. BAUTOFT.
13. JOHN CHARLETON, Merchant, No. 50, John Street, Sunderland.—Sunderland and neighbouring ports.
14. WILLIAM COLLIER, Merchant and Shipowner, Dundee—River Tay.
15. JOHN COOK, Shipowner, and Ship and Insurance Broker, 48, Marischal Street, Aberdeen.—Aberdeen.
16. W. F. COLLIER, Merchant, and Lloyd's Agent, Plymouth, of the firm of Collier Brothers.—The port of Plymouth.
17. RICHARD CORY, junior, firm of R. Cory and Sons, Shipowners, &c., and Ship Brokers, Cardiff.—Bristol Channel.
18. WILLIAM CROZIER, Shipowner, Pine Villa, Blackheath Hill, Kent.
19. JAMES CUCKON, Shipowner and Ship Chandler, Key Street, Ipswich.—Harwich lights, from the fact of Languard Fort point, or beach, having grown up, are very inefficient for the purpose intended.
20. W. B. CUMING, Shipowner and Surveyor, 8, Lansdowne Place, Plymouth.—Plymouth.
21. S. W. DAVEY, Harbour Master.—Port of Padstow.
22. Gentlemen.—In reply to your queries respecting maritime matters, as enclosed, I beg to inform you that I am not competent to answer any of the questions therein contained, and think there must be some mistake in sending it to me. I am in no way connected with shipping or the port of Sunderland.—I am, &c., THOS. DAWSON.
23. ALEXANDER DEANI, Cork, Merchant and Shipowner.—The harbour of Cork.
24. PETER DENNY, Iron Shipbuilder, Engineer, and Shipowner, of the firm of William Denny and Brothers, Dumbarton.—I have not devoted any attention nor am I sufficiently practically acquainted with the matter set forth in the various queries to enable me to speak upon them.
25. JOHN A. DE PUTRON, Ship Broker, 8, Billiter Square.—Guernsey and Jersey ships.
26. PHILIP DE ST. CROIX, Merchant and Shipowner, Jersey.—Port of St. Helier and Bay of St. Aubin, south coast of Jersey.
27. JOHN DRYDEN, Shipowner, North Shields.—Port of Shields.
28. GEORGE DUNCAN, Ship and Insurance Agent and Shipowner.—London particularly, with what has come under my notice when 10 years in command of a ship in Baltic, America, and India trades.
29. CHARLES DUNN, Shipowner, Newcastle, of the firm of Clarke and Dunn.—Tyne.
30. ALLAN EDWARD, Merchant and Shipowner, Dundee.—River Tay.
31. JOHN EDWARDS, Ship Broker, 77, Quay, Bristol, of the firm of John Edwards and Co.—Bristol Channel.
32. ARCHIBALD FINNIE, of Archibald Finnie and Son, Merchants and Coalmasters, Kilmarnock.—Not sufficiently conversant with the subject-matters of inquiry to give answers.
33. ALFRED FOX, of the firm of G. C. and R. W. Fox and Co., Falmouth.—Falmouth.
34. EDWARD FRANCIS, London.—Having no personal acquaintance with the subject of this circular, I am unable to respond to these questions.
35. ALLAN GILMOUR, Merchant and Shipowner, Pollok, Gilmour, and Co., Glasgow.—Frith and River Clyde.
36. ERENEZER GODDARD, Chairman of the Ipswich Maritime Association.—To the lights to the entrance of Harwich Harbour, situated at Harwich.
37. JAS. J. GRIEVE, Merchant, Greenock, firm of Baine and Johnston.—Frith of Clyde.
38. THOMAS HAMLIN, Pilot Master, &c., 7, West Stewart Street, Greenock.—Greenock and the Clyde.
39. JULIAN B. HARRIS, of Arthur B. Harris, and Co., Milford, South Wales, Ship and Consular Agents.—The coast between Tenby and Milford Haven.
40. THOMAS HENDERSON, of Handysides, and Henderson, Merchants and Shipowners, 45, Union Street, Glasgow.—River and Frith of Clyde.

41. THOMAS HOOD HENDERSON.—Shipowner, Newcastle-upon-Tyne.—District under the management of the Corporation of the Trinity House, of Newcastle-upon-Tyne.
42. LAURENCE HILL, Shipbuilder, Port Glasgow.
43. GEORGE HENRY HILL.—Shipowner, 18, Parliament Street, Hull.—Hull.
44. RICHARD HILL, Shipbuilder and Shipowner, Catdown Yard, Plymouth.—Port of Plymouth.
45. JOHN HOLMAN, Shipowner, Grove House, Topsham, firm of John Holman and Sons.—Exmouth Bar and River Exe, Port of Exeter.
46. HENRY HOOPER, Underwriter, &c., Lloyd's.—None to give.
47. JAMES HORE, Shipowner and Insurance Broker, Parade, Exmouth, Devon.—Exmouth, Port of Exeter.
48. RALPH MILBANKE HUDSON, Shipowner, &c. Sunderland.—Principally to Sunderland. Also with reference to the Trinity House, Newcastle-upon-Tyne, and their powers to charge tolls on trade of Sunderland.
49. THOMAS OLIPHANT HUNTER, Merchant and Banker, and Lloyd's Agent for the Clyde.—Frith of Clyde.
50. WILLIAM INMAN, Agent for the Liverpool, New York, and Philadelphia Steam ship Company, Liverpool.—Liverpool.
51. JOHN JACKSON & Son, West Strand, Whitehaven, Ship and Commission Agents.—Ports in the Solway Frith, say Whitehaven, Warrington, Workington, and Maryport.
52. MATTHEW JONES, late Ship Master, now of the firm, M. Jones and Brothers, Ship Brokers, &c., 5, Somerset Place, Swansea.—My evidence would apply more particularly to the Bristol Channel, which coast is well and properly lighted; and with the addition of a lightvessel on the west end of the Skerweather Sand would be almost perfectly so. I may also add, a light for Bideford Bar, from sunrise to sunset, is much in requisition.
53. JOSEPH LAING, Shipowner, Stockton-on-Tees.—Port of Stockton, River Tees.
54. GEORGE LESLIE, Merchant and Shipowner, 11, Quay, Aberdeen.—Aberdeen.
55. W. LINDSEY, Shipowner and Magistrate of Leith.
56. ROBERT MAINE, Swansea, Shipowner, Retired Master Mariner.—Swansea Bay.
57. GEORGE MARSHALL, Shipowner, 3, Cross Lane and Mary-at-Hill, London.—East coast and English Channel.
58. JAMES MARTIN, of firm of John Martin and Son, Merchants and Shipowners, Dublin.—To Ireland generally, but principally to Dublin.
59. Sir,—I have to acknowledge the receipt of your paper submitting questions for answers relating to the management of lighthouses, &c., and in reply beg to state my regret at not having positive acquaintance of the various points thereon which may be likely to assist the Royal Commission.—I have, &c., JAS. MARTIN.
60. THOMAS MARWOOD, of the Firm of Thomas Marwood, & Co., Insurance Broker, Whitby.—Has not sufficient practical acquaintance with the subject, or given it such attention as would justify him in tendering answers either to the special or general questions.
61. GEO. MENZIES, Menzies & Co., Shipbuilders, Leith.
62. WILLIAM MIDDLETON, of Middleton and Pollexfen, Shipowners and Agents, Sligo.—Sligo.
63. MESSRS. MILLIGAN, EVANS, & Co., regret that, from their very slight experience as shipowners they cannot answer these questions of their own knowledge, and as no doubt that is the object of the Commissioners, they refrain from offering opinions by other parties.—Liverpool, Feb. 10, 1860.
64. JOHN MOFFAT, C. E. and Lessee of Ardrossan Harbour, Ardrossan.—My evidence applies to the harbour of Ardrossan.
65. HARTWELL MORICE.—Shipbroker and Coal Factor, Swansea.—Swansea.
66. DONALD R. MACGREGOR, Shipowner, Leith.—Frith of Forth.
67. M. KNILL, M. Knill and Co., 29, Pudding Lane, E.C., Ship Agents, Master Mariner.
68. COLIN McCALLUM, Ship Broker.—Regrets he cannot give the Commission any information.
69. WILLIAM McEWEN, Merchant, St. Vincent Lane, Glasgow.—Not having for many years had any interest in shipping I have not been paying light dues, and, consequently, have not given the matters referred to in the above questions such attention as to enable me to answer them satisfactorily, or to give information of my own thereupon worth the recording.
70. R. NAPIER and Sons, Glasgow, beg to inform Mr. Campbell that, having very little experience in lighthouse matters, not being themselves owners of vessels, and, consequently, seldom subjected to light dues, any information they could give on the subject of lights, buoys, or beacons on the Clyde would be of very little, if any, value.
71. GEORGE ORANGE, Merchant and Shipowner, 11, Gloucester Street, Jersey.—Jersey.
72. JAMES ORR, of James Orr and Co., Shipbrokers, &c., Londonderry.—Lough Foyle (or River Foyle).
73. THOMAS PEAKE, Shipowner, 18, Caroline Place, Stonehouse, Plymouth.—Port of Plymouth.
74. BLIGH PEACOCK, of the Firm of Peacock Brothers.—Shipbrokers, Sunderland.
75. JAMES EDWIN PIM, Cork, Shipowner and Merchant.—Cork Harbour.
76. JOHN S. PHILLIPS, Newport, Monmouth, Recorder of Wrecks.—Newport, Monmouth.
77. WILLIAM PHILLIPS, of the firm of Phillip's, Shaw, and Lawther, No. 2, Royal Exchange Buildings, Shipowners and Shipbrokers.—General.
78. WILLIAM PRIEST, Shipowner, 7, Quay Street, Hull.—My evidence is intended solely to apply to the River Humber.
79. FRANK THORPE PORTER, Barrister, Magistrates, Head Office, Dublin Police, and ex officio Member, Dublin Local Marine Board, 15, Upper Merrion Street, Dublin.—I know nothing of any port except Dublin, and very little respecting Dublin.
80. JOSHUA PROWSE, Shipowner, 11, Ansdell Street, Liverpool.
81. ARCHIBALD RITCHIE, Retired Master Mariner, also late Manager of the London and Edinburgh Shipping Company, 7, Madeira Place, Leith.—Having retired from business I have no evidence to give.
82. CHARLES JOSEPH RICHES, Shipowner and Ship Broker (formerly Master Mariner), No. 1, East Cross Street, Sunderland; name of firm, Riches and Kay.
83. JOHN RILEY, Shipowner and Ship and Insurance Broker, of the firm of Peter Tindell, Riley, and Co., 17, Gracechurch Street, London.
84. JOHN ROBINSON, Shipowner, 48, East King Street, South Shields.—English Channel, and Red Sea, if this inquiry extends so far.
85. WILLIAM ROSE, Shipowner, of Donaldson, Rose, and Co., Aberdeen.—The personal observation of the writer has been confined to the neighbourhood of Aberdeen.
86. ROBERT SHANKLAND, Shipowner, Greenock.—Clyde.

87. GIDEON SMALES, Shipowner, Whithy, the owner of 26 sail of ships employed in the coasting and foreign trades.—Two new lights lately erected about two to three miles south of Whithy.
88. GEORGE SPARK, Shipowner, South Moor, Sunderland.—Sunderland
89. JAMES STEWART, of J. and W. Stewart, Greenock.—Evidence applies to the Clyde.
90. THOMAS STEVENS, Shipowner, 3, Parade, Plymouth.—Port of Plymouth.
91. THOMAS JONES STEVENS, Ship Broker and Agent, Exchange, Plymouth (Secretary to the Plymouth Shipowners' Society, Secretary to the Chamber of Commerce of the Port of Plymouth, &c. &c.).—Port of Plymouth.
92. T. W. SWEET, Shipowner, 13, John Street, Minories.—No particular locality.
93. RICHARD SLEETH, Liverpool.—I have perused the questions put in this paper, and do not find myself able to give an answer to any of them.
94. CHARLES SKIRLING and JOHN DOUGLAS, Ship Brokers, trading under the names of Skirling, Douglas, and Co., 6, Britannia Buildings, Bute Docks, Cardiff.—General.
95. CHARLES SMITH JUNIOR, of the firm of Charles Smith and Son, Ship and Insurance Brokers and Shipowners, Quay Side, Newcastle-upon-Tyne.—Port of Newcastle-upon-Tyne and North and South Shields.
96. GEORGE SMITH, junior, Merchant and Shipowner, 208, Argyle Street, Glasgow.—Clyde lights and those on the coast of Ireland.
97. JOHN STRIBLEY, Master Mariner 15 years, now Shipowner.
98. GEORGE B. SULLY, Merchant and Shipowner, Bridgewater, and Manager of the Bridgewater Shipping Company, Limited.—Bridgewater.
99. Sir,—I have to acknowledge your communication received yesterday, and, in return, beg to say that I am not in possession of any information respecting the management of buoys or beacons which would be of any service to the Commission of Inquiry.—I am, &c., E. D. THOMPSON, South Shields, 8th February 1860.
100. Sir,—I beg to acknowledge receipt of series of queries relative to the management of lights, buoys, and beacons, and, in reply, beg to state that not being practically acquainted with the subject my opinion will be of little value, I therefore return the paper in accordance with the printed instructions.—I remain, &c., JOSEPH L. THOMPSON, South Shields, 11th February 1860.
101. JAMES TROSDALL, Shipowner, Stockton-on-Tees.
102. Mr. T. B. WALKER, to whom the inclosed was addressed, having died three years ago, it was sent to me as his executor, and I therefore beg to return it.—I am, &c., HENRY FOWLER, Scarborough, 8th February 1860.
103. THOMAS WARD, Shipowner, Hull.—My knowledge is confined in a great degree to the locality of the Port of Hull.
104. GEORGE WELCH, Ship Agent, &c., firm of Welch and Jack, Dundee.—The River Tay.
105. GEORGE WILKINSON, Shipowner, Hartlepool.—Port of Hartlepool.
106. Sir,—As a relation of the late Mr. Geo. Wilkinson this communication was left with me, and I think it only proper to return it, and to state that Mr. Geo. Wilkinson has been dead for a great many years.—I am, &c. W. H. KEENLYSIDE, Stockton-on-Tees, 10th February 1860.
107. Sir,—I beg to acknowledge the receipt of your letter with inquiries regarding lights, buoys, and beacons, but I am not myself sufficiently acquainted with the subject to be able to give you the practical information which you require.—I am, &c., NATHL. WILSON, Mayor of Devonport, 8, St. Michael's Terrace, Stoke, Devonport, 10th February.
108. JOHN KAY WISHART, Merchant and Shipowner, Leith.—Frith of Forth
109. J. WILLIAM WRIGHT, Senior Partner in the firm of Wright, Bed, and Co., Deputy Chairman of the Hull Dock Company, Merchant, and late a Shipowner, a Justice of the Peace of the East Riding, and living at Siggesthorpe Hall in the East Riding, of the county of York, &c.—To the locality of the River Humber.
110. Sir,—I have received from you a form for the purpose of enabling me to offer any information of which I might be possessed relative to the buoys, beacons, &c. in this neighbourhood, and I beg to assure you that I would gladly place such information at your disposal where I able, but not having interested myself in the question at point, I am totally unable to do so. I would suggest that Mr. John Batchelor of this town might very probably be enabled to give you much valuable information on the subject.—I remain, &c., HEN. H. WORMS, J. R. SMITH, Cardiff, 7th February 1860.
111. JAMES LETTLES, Shipowner, North Shields.—Port of Shields.
112. ROBERT EASTON YELLAND, Banker, Bideford, Devon, who begs to return the form in blank, as he does not feel competent to answer the questions.
113. GEORGE YORK, Solicitor, Boston, Lincolnshire.—Port and Harbour of Boston in the county of Lincoln.
114. GEO. FRED. YOUNG, Oakfield Lodge, Reigate, Surrey, Shipbuilder at Linchouse, Middlesex, under the firm of Young, Son, and Magney.—Formerly as an extensive shipowner, to the Port of London and the British Channel, and still, from connexion, acquainted with the facts.

3.

Question

3

3. Give the Title and Address of any Authority, resident or otherwise, exercising control over or responsible for the efficiency of the Lights, Buoys, or Beacons in the Place to which your evidence applies.

1. Cumbrae Light Trust.
2. Commissioners for Northern Lights, Edinburgh; Trustees for Kirkwall Harbour, Kirkwall.
3. Harbour Commissioners of Bellfast.
4. Ipswich Dock Commissioners.
5. None in particular.
6. The Mersey Docks and Harbour Board.
8. Trinity Board.
10. The lights, buoys, and beacons are under the control and responsible efficiency of the Trinity House of Hull.
11. Regarding Dundee and River Tay, authority exercised by Trinity House, Dundee.
13. The River Wear Commissioners as to beacons, buoys, and lights of the port of Sunderland; Trinity House of Newcastle as to Shields Harbour lights.
14. The Corporation of Masters and Seamen in Dundee, otherwise the Dundee Seamen's Fraternity.
15. The Commissioners of Northern Lights have the control of the outer or Girdleness lighthouse, and the Harbour Commissioners of the inner or harbour lights.
16. Captain Ditcham, No. 6, Alma Place, Plymouth, the officer appointed by the Trinity Board, for the lights; Captain Thompson, Queen's Harbour Master, Bovisand, Plymouth, officer appointed by the Admiralty, for the buoys; the Corporation of Saltash in respect of one buoy.
17. No resident authority at this port; lights, buoys, &c. under the control of the Trinity House.
20. Trinity Board for the lights, Admiralty the buoyage, and the Corporation of Saltash for the Cobler buoy.
21. The Commissioners of the Padstow Harbour Act have no authority over any; but the Padstow Harbour Association (a charity) have a beacon.
23. The Ballast Board of Dublin and Cork Harbour Commissioners.
26. Pier and Harbour Committee of the States of Jersey.
27. Trinity House, Newcastle, for harbour lights; Trinity House, Deptford Strand, for coast lights.
28. With this not conversant.
29. Trinity House, Newcastle; Trinity Board, London; Tyne Commissioners.
30. The lighthouses and buoys of the Tay are the property and under the management of the Fraternity of Masters and Seamen, Dundee, which is incorporated by Royal Charter.
31. Nil.
33. Trinity House, London.
35. Commissioners of Northern Lighthouses for the Frith of Clyde; Cumbrae Light Trustees, by an Act passed in 1756, for estuary of the River Clyde, from the Cumbrae Heads to Port Glasgow or Newark Castle; Clyde Trustees, under Clyde Navigation Consolidation Act, 1858, for the River Clyde from Newark Castle to Glasgow.
37. "Cumbrae Toward and Clock Light Trust," composed of part of the Clyde Trustees, Provost and Bailies of Greenock, Provosts of Renfrew, Dumbarton, and Port Glasgow.
38. The Cumbrae Light Trust and the Clyde Trustees.
39. B. H. Bailey, Esq., Trinity Superintendent.
40. The Trustees of the River and Frith of Clyde.
41. The Master and Brethren of the Corporation of the Trinity House, Newcastle.
42. Clyde Trustees.
43. Trinity House, Hull.
44. The lights are under the control of the Trinity Commissioners; buoys of the Admiralty. There is a resident superintendent of the lights, Mr. T. E. Ditcham, of Alma Place. The buoys are under the care of the dockyard authorities, except a buoy on the Cobler Ledge, Plymouth Sound.
45. There are no lights. Buoys on the bar and lower part of the river are under the control of Trinity House, London. At the upper part of river, beacons are kept up by the Town Council of Exeter.
46. None to give.
47. Henry Pyne, acting under the Trinity Board, Exmouth.

48. The River Wear Commissioners exercise control over the harbour lights of Sunderland. The Trinity House, Newcastle, who exercise control over the harbour lights of the River Tyne, also certain buoys in the vicinity of Holy Island, take toll from the shipping trading to this port for their support.
49. Cumbrae Light Trust, managed principally by the magistrates of Glasgow and Greenock.
50. Mersey Docks and Harbour Board.
52. I know of no particular authority, with the exception of the lighthouse keepers, with many of whom (when I commanded a steamer touching at the different ports) I was acquainted.
53. Fees Conservancy Commissioners, Stockton-on-Tees.
54. The Commissioners of the Northern Lights for the Girdleness, and the Harbour Trustees for the harbour lights.
56. Swansea Harbour Trustees.
57. Trinity House, London.
58. The Ballast Board.
62. Ballast Board, Dublin.
64. The Earl of Eglinton and Winton, Eglinton Castle, Irvine.
65. The Swansea Harbour Trust are responsible for the lights on the pier of this harbour and at the Mumbles, the expenses of which are paid out of the harbour fund.
66. Commissioners of Northern Lights.
71. The Committee of Harbours, appointed by the States.
72. The Port Harbour Commissioners.
73. Trinity Board.
75. Cork Harbour Board and Ballast Board of Dublin.
76. Trinity House of Deptford Strand.
77. The Trinity Corporation.
78. The Hull Trinity House and the Commissioners of Pilots.
79. The Corporation for Preserving and Improving the Port of Dublin.
81. Commissioners of Northern Lights.
86. Cumbrae Light Trust, Glasgow.
87. Corporation of Trinity House, London.
88. The Commissioners of the River Wear; the Bishop of Durham and his lessee the Earl of Durham (Beaconage, &c.).
89. Cumbrae Lights.
90. The lights on the Breakwater and the buoyage well attended to by the Admiralty. The borough of Saltash maintains a buoy at the danger or western end of the Batten Ledge. Saltash claims anchorage for all parts of the port within the heads, and charge 1s. per ship, British; 2s. foreign; and 6s., Spanish. Board of Trade pays 1s. on the foreign, and 5s. on the Spanish ship on reciprocity treaties; which, however, does not gain the same privilege of repayment for extra charges on British ships in foreign ports. Many have objected to the Saltash toll of 1s.; but I never did, as I think it a very light port charge indeed.
91. Edystone lighthouse, Breakwater lighthouse, beacon on the Hoe, Trinity House, London; sundry buoys in Plymouth Sound to indicate shoals and patches, Lords Commissioners of the Admiralty; Cobler buoy (otherwise buoy on the Batten Ledge), Plymouth Sound, Mayor and Corporation of Saltash, Cornwall.
94. Cannot name any address.
95. Trinity House of Newcastle and River Tyne Commissioners.
96. Clyde Trustees, Cumbrae Light Trustees, and Commissioners of Northern Lights.
98. Lights, Trinity House; buoys and beacons, Port Navigation Committee of Town Council.
103. The Corporation of the Trinity House exercise control over the lighting and buoyage of the Humber, and, I believe, are solely responsible for the efficiency of the same.
104. Fraternity of Masters and Seamen in Dundee, commonly now called the Trinity House.
105. Wm. O. Mossman, naven master to the Hartlepool Pier and Port Commissioners, is the superintendent of the general lights, buoys and beacons of the port. The harbour masters of East and of West Hartlepool are superintendents of the lights, buoys, and beacons of their respective harbours and docks.
108. Commissioners of the Northern Lighthouses.
109. Trinity House, Hull.
111. Trinity House, Newcastle, for harbour lights; Trinity House, Deptford Strand, for coast lights.
113. The mayor, aldermen, and burgesses of the borough of Boston aforesaid, named as commissioners for carrying

3, 4.

Question

4, 5.

- into execution certain Acts of Parliament for improving the port and harbour of Boston, &c.
114. The Corporation of Trinity House of Deptford Strond,

4. Judging from facts within your own knowledge, or from your own experience, how is the Service conducted by the Authority having the management of, or control over, the Lights, Buoys, or Beacons, above referred to?

1. Believe the service is efficiently conducted.
3. Perfectly efficiently.
4. I have been a member of the Board of Harbour Commissioners, and have of my own knowledge reason to say that the management has been very efficient.
5. From my own knowledge I believe the buoys and beacons are well kept up; no lights are required.
6. Not acquainted.
7. No complaints within our experience; we presume, therefore, efficiently and regularly.
8. Satisfactorily.
9. Very well, to the best of my knowledge.
10. I believe the management of the above Corporation is in every respect satisfactory to all interested.
11. Generally, I consider the service as regards the River Tay reasonably well conducted.
13. I know nothing to the contrary of the good conducting of the service.
14. So far as I know the management of the lights is good.
15. I have never known any cause of complaint, or heard any, against the management of any of the lights in this quarter.
16. The service appears to be conducted in a manner satisfactory to all concerned.
17. I hear of no complaints.
20. Very well.
21. The Trevose Head Trinity light is very well conducted; the day mark beacon is very useful.
23. I consider the service fairly managed.
25. Very well.
26. Well.
27. Well conducted.
28. Consider the service to be now most efficiently conducted.
29. Well conducted.
30. So far as the efficiency of the lights and buoys are concerned, I believe the management to be good.
31. Nil.
33. Well conducted, as far as I can judge.
35. From the experience which I have had in the management of a considerable number of ships of large tonnage in the foreign and colonial trades, I consider the service is conducted in a proper and fairly efficient manner.
37. Satisfactorily.
38. Efficiently.
39. Lights and buoys seemed carefully attended to.
40. Efficiently.
41. The service is efficient; but conducted expensively.
42. Satisfactorily.
43. Good.
44. The management of the lights, buoys, and beacons appears to be well conducted by the Trinity and Admiralty authorities.
45. All the service of buoys and beacons is well conducted. I have not heard a complaint for many years.
46. Do not know.
47. Satisfactory.
48. Satisfactory, so far as the Sunderland Harbour lights are concerned. I know nothing prejudicial to the service of the others.
49. Lights and buoys have always been kept in excellent order. The Toward lighthouse has been very much improved of late.
50. Well conducted.
52. My opinion is that the duties are performed most efficiently.
53. The service on the whole is very well conducted.
54. I have not known or heard complaints against the lights in this district.
56. Properly.
57. Very satisfactorily.
58. Fairly.

62. Well.
 64. It is well conducted.
 65. The service is efficiently managed. I have never heard of any complaint.
 66. Well.
 71. Having no lighthouses on this island beyond pier or harbour lights, they are, with the buoys and beacons, under the control of the above-named Committee, which I consider not adequate to the present requirements of trade or shipping.
 72. There is no complaint; lights are well attended to.
 73. Every attention paid, and the office well carried out.
 75. I have no complaint to make.
 76. Most satisfactorily.
 77. Very satisfactorily.
 78. From my own knowledge and 45 years' experience as a shipowner and shipping agent, the services and management of lights, buoys, and beacons are well conducted, and inferior to none in the United Kingdom.
 79. I have heard no complaints of the management, but the body is not popular. The shipping interest is not considered to be adequately represented.
 81. I think satisfactorily.
 86. Efficiently.
 88. The Commissioners conduct the service of which they have the management tolerably, though there are spots which within their jurisdiction (such as the White-stones, Whitburn Steel, and a rocky shelf lying to the south of the new outlet from the south docks) which ought to be but are not buoyed. The Bishop and Earl of Durham perform no services whatever in return for the dues they collect.
 89. Efficiently.
 91. By the Trinity House and Lords Commissioners of the Admiralty, most efficiently; by the Mayor and Corporation of Saltash, quite the reverse.
 94. Very satisfactorily.
 95. Satisfactorily managed.
 96. The general management and efficiency of the lights, buoys, and beacons has been satisfactory.
 98. Very well.
 103. The service is performed in a satisfactory manner.
 104. The service of the lights, buoys, and beacons is well conducted by a master, deputy master, and a committee of 12 master members, all shipmasters, who have retired from the sea, who manage with fee or reward; nothing is omitted that would tend to improvement.
 105. Very satisfactorily.
 108. Well.
 109. During more than a quarter of a century I have been a merchant in the port of Hull; I have seldom or ever heard of any complaints, and I believe the service is well conducted.
 111. Generally well and efficiently conducted.
 113. The river lights are well attended to, and the channel is considered to be as well buoyed and beacons out as any port in the United Kingdom.
 114. Always as well as could reasonably have been expected. Great improvements have been made from time to time, as science has progressed and attention been directed to the points referred to; but I have always found a desire and readiness on the part of the Elder Brethren to remedy any defects in the lighting, buoyage, and beaconage entrusted to their management, and to adopt all real improvements therein.
5. So far as you are informed, what is the opinion generally expressed by Master Mariners frequenting the Place above-named, as to the efficiency and sufficiency of the Lights, Buoys, and Beacons above referred to.
1. Not aware of any complaint, either as regards efficiency or sufficiency of the lights, &c.
 3. Existing lights and buoys efficient; beacons efficient, excepting one placed upon Vasa Skeary, which is not at all so; but the number is not sufficient of any of them.
 4. As regards the harbour of Belfast and the approaches thereto, all parties frequenting it must be and I believe are quite satisfied; in fact, there are few places more effectually provided with the requisite lights, buoys, and beacons. A fog bell on Copeland Island, at the entrance to our lough, is useless, owing to its position.
 5. I believe the opinion of master mariners, frequenting this port, is, the river on the whole is sufficiently buoyed.

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Question

5.

- Not aware of any particular objections; general satisfaction I believe is given.
7. See last answer.
 8. All that is required.
 9. I have never heard of any complaint.
 10. I never hear of any complaint from master mariners of a want of efficiency of the lights, &c., and I can say of my own knowledge of the Brethren of the Trinity House, that they are easy of access, and ever ready to do their duty as regards lights, buoys, &c. in their jurisdiction, which is confined chiefly to the River Humber.
 11. The opinion stated in the last reply.
 13. I have no knowledge of any complaints made of any abuses, nor of the existence of such.
 14. The lights and buoys, as far as I know, are considered by mariners amply sufficient for navigating the river.
 15. Favourable; at least no complaints are made.
 16. With regard to the lights the Breakwater light is not sufficiently distinct; and it has been suggested to me that a strong flash light, or other distinctive light, should be placed on the Mew Stone. The buoys are both efficient and sufficient.
 17. Captains generally are satisfied.
 19. Satisfactory, with the exception of Harwich lights, which is the entrance from sea to this port.
 20. Good.
 21. Regarded as being very serviceable.
 23. Masters of vessels are not satisfied with the Cork Harbour light, they consider it faint.
 26. Satisfactory; I am not aware of any complaints having been made to the before-mentioned Committee.
 27. Considered sufficient.
 28. From my own knowledge, and from what I hear from master mariners and branch pilots, they are generally efficient for the entrance to the Thames; but all concur in considering a lightship should be placed in the west end of Varne Sand; and, when sailing nine years ago, I was astonished that there was no light there.
 29. No complaints.
 30. So far as I have heard, the opinion of mariners is, that the lights and buoys in question are sufficient for the safe navigation of the river.
 31. Opinion expressed is, a want of a lightship on the west end of Scareweather Sand; a light on Breaksea Point, and also on Mort Point.
 33. They are generally well satisfied, though I have often heard a desire expressed for a light on the Manacles, at or which many vessels have been lost.
 35. The opinions generally expressed by the masters of the ships under my charge, and others, are, that the lights, buoys, and beacons referred to are sufficient for the navigation, except in thick or foggy weather, when the firing of a gun at stated intervals at the lighthouses at the Cumbrac Heads, Pladda, and Sanda, would be of great benefit.
 36. Owing to the accumulation of the sand at the beach end, the present lights are by no means a safe guidance into the harbour.
 37. Hear of no complaints.
 38. Favourably.
 39. That the harbour lights of this haven are excessively good and well placed, but that something is required in the way of a light between this harbour's mouth and Tenby, to avoid accidents in thick weather, the soundings in many places being deep up to the very rocks. Say a coloured light, on one of the prominent points, and an alarm bell. If these had been in existence, doubtless many vessels that have been lost on Crow Rock, Linney Head, Pole Rock in Bullslaughter Bay, Freshwater, East, &c., would have been saved. See wrecked vessels—iron ship "Fusilier," of Liverpool; "Grand Duke," "Grao Parao"; steamship "Amelia," of Liverpool, and many others.
 40. Favourable.
 41. I understand that their efficiency is unquestioned, and that they are sufficient.
 42. Have never heard any complaints.
 43. As efficient as most ports, and better than many. I have six masters in my employ.
 44. I have heard some master mariners express an opinion that the light on the west end of the Breakwater was not sufficiently bright to be seen at any distance; and also that the eastern channel to Plymouth Sound required a beacon on the Shag Rock. Have heard no complaint respecting the buoys.
 45. Many master mariners have expressed a desire for a light on Start Point, otherwise there is no complaint.
 46. Do not know.
 47. They complain generally of the want of a light at the entrance of the harbour.
 48. Quite sufficient for the purpose.
 49. I have always heard the sufficiency of the lights and buoys spoken of approvingly by ship masters.
 50. Very good for every purpose.
 51. There is but one opinion upon the subject of this light, by all concerned, viz., that it should be paid for on passing.
 52. I have heard masters wish a light on Breaksea Point, 12 miles east of the Nash lights; it is a very low, long point. This, with the want of lightvessel on the west end of Skerweather, and also all-night light on Braunton Burrow (*if necessary I will give you my reasons for such a light being exhibited*), so as to show the whereabouts of Bideford Bar, are the only complaints I have heard; and, for the latter two, I consider the complaints are justly made. I speak from experience.
 53. Generally, I believe, they are well satisfied.
 54. Favourable.
 55. I refer to the answer given to this query by J. K. Wishart, Esq., of Leith, and adopt it as my answer.
 56. I believe that a lightship on the west end of the Skerweather Sands would be of great utility, and an additional buoy on the east end of the Mixon Sand.
 57. I do not hear any complaint.
 58. Shipmasters speak favourably on this point.
 61. So far as we have heard shipmasters speak of the efficiency and sufficiency of the lights, &c., that they were highly pleased.
 62. That there are not sufficient lights, buoys, and beacons.
 64. It is favourable.
 65. All masters of ships, especially foreigners, have expressed themselves quite satisfied with the efficiency and sufficiency of the lights, buoys, and beacons.
 66. Light on St. Abb's Head much wanted, but now being erected. There should also be a lightship on the Gunnet (west of Inchkeith.)
 71. The opinion expressed by master mariners generally is, that this island is not lighted as it should, and that considering its dangerous locality, it should be better buoyed.
 72. No complaints.
 73. Great fault found with the Breakwater light not being strong enough. The least haze the light is not discernable until you are close into the lighthouse; a bright flash light would be preferable.
 75. The Cork Harbour light not sufficiently strong to seaward; many complaints from master mariners; the buoys and beacons of the harbour are very good.
 76. I have not heard of any complaints by masters of the inefficiency of the lights, buoys, and beacons.
 77. General approval, with the exception of Cape Grenez and Dungeness lights, which are sometimes in thick weather fatally mistaken one for the other.
 78. It is the general opinion of shipmasters, whether British or foreign, so far as I have questioned them, that the River Humber, by its being so well lighted, buoyed, and beacons, is the most easy of access of all the rivers in the kingdom.
 79. In answer to Questions 5, *et seq.*, Mr. Porter says, I do not consider myself qualified to speak on any of these subjects. I respectfully suggest that Alderman Martin and his brother, Mr. Richard Martin, who are the most extensive shipowners of this port, should be applied to. I would attach very great importance to any opinion expressed by them.
 81. Satisfactory; but I think an additional light is wanted on the east pier of Leith, as a guide to ships taking the harbour.
 84. Master mariners generally complain that in the English Channel the lights on the French coast are far superior to those on the English; that they are brighter, and can be seen sooner and longer. There is a great want of lights in the Red Sea, and partly in consequence the premiums of insurance have risen to 10 guineas per cwt., and government have to pay inward charges on coal for their vessels.
 86. Favourable.
 87. I believe the opinion of master mariners frequenting this coast, is, that the lights before named are not efficient for the purpose intended; first, from their high situation, and partly surrounded by hills. In foggy weather the land and heights are frequently capped, and until the light on Whitty Pier is made a permanent light, being on a lower level, the purposes intended will not be accom-

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Question

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- plished, viz., of keeping ships running up from the north off Whitby Rock. Further, that the position of these lights has lately caused serious destruction of property. Ships running to the north in hazy weather, after passing Flamborough Head lights, haul in to sight those lights at High Whitby, and from their peculiar situation and position, become embayed, and do not see the lights. The consequence has been, first, five sail, and recently eleven sail, of ships have all run on to the north cheek of Robin Hood Bay, about one and a half mile south of the lights, several of which have become total losses, and the rest very seriously damaged.
88. I cannot say; I am not much amongst master mariners.
89. Favourable.
90. I have not heard of complaints on this head, nor do I think there are reasons for any; but complaints respecting the Government ships having all the best anchorage under the Breakwater is, I think, fair reason of complaint.
91. Satisfactory; except as to the exaction for the Cobler buoy, hereafter referred to; and occasional complaints of the weakness and indistinctness of the Breakwater light, as not being discernable at a distance.
94. We do not hear any complaints.
95. Generally satisfactory.
96. Our captains frequently have expressed to me their satisfaction with the sufficiency and efficiency of the Clyde lights; but several of them have complained of the position of what is termed the light at the South and North rocks, St. John's Point, near Ballywalter, as being situated too far away from the danger, and calculated to lead vessels bound out channel astray. The necessity of signal guns during fogs has also been pointed out to me repeatedly as being a necessary appendage to lighthouses.
98. Satisfactorily.
103. I have not heard any complaints relative to any want of efficiency and sufficiency of the lights, &c. in question.
104. So far as I am aware there has not been a complaint since I have been residing on shore, although I have heard it suggested by coasting masters that the pile light at South Ferry should be discontinued, and a tower built on a low water rock, about double the distance of the present low tower (not used) from the high tower.
105. Very favourable.
108. I hear no complaints as to buoys or beacons, or as to present lights; but it is thought that more lights are wanted. Shipmasters complain of the want of lights at the entrance of the Frith, on the North Carr, upon the north, and on St. Abb's Head on the south side, while up the Frith lights are much needed upon the Oscars, as well as Garvie Island; were a light put on the North Carrs, the leading light on the Mez might be dispensed with.
109. I do not remember any complaint from any master mariner of inefficiency of lights or buoys.
111. Generally considered sufficient.
113. The same answer applies as to Question 4.
114. Concurrent with my answer of the preceding question.
- 6 Are any Dues levied or collected at the Port or Place avowedly in respect of Lights, Buoys, or Beacons, other than Dues collected for Lights, &c., under the control of the Trinity House, Commissioners of Northern Lights, and Ballast Board.
1. The dues levied are 1*d.* per ton on foreign-going ships, and ½*d.* per ton on coasting vessels, whether with cargoes or in ballast. These dues are collected by the Cumbræ Light Trust, in addition to the dues charged on behalf of the Commissioners of Northern Lights, &c.
3. None.
4. I am not aware that there are any local dues in respect of the lights, &c.
5. None.
6. I do not know of any.
7. Yes; for several local and harbour lights.
8. None.
10. There are no light dues payable at this port, except for those above-named in the No. 5, to the Hull Trinity House, with respect the River Humber, and of course the coast lights to the Trinity House Commissioners.
11. Yes.
13. The Wear Commissioners collect Sunderland Harbour light dues; the Newcastle Trinity House collects for Tyne lights on loaded and light vessels in and out of ports between Holy Island on Northumberland coast, and Staiths on Yorkshire coast; also for buoys, &c. at Holy Island, &c.
14. None.
15. For the pier light by night, and flag by day, and for the leading lights, a small charge is made on all ships along with the tonnage dues on entering the port.
16. The Corporation of the borough of Saltash, on the River Tamar, levy 1*s.* for every vessel every time such vessel enters this harbour, in respect of the Cobler buoy. Foreign vessels pay higher dues, but 1*s.* only is levied, Government paying the difference. No other dues are collected.
17. The charge of 5*s.* on each vessel is levied by the town, ostensibly for the purpose of supporting some half dozen river buoys leading to the Glamorganshire canal, which canal is now rarely used, and then only by the smallest class vessels.
20. Yes; the Corporation of Saltash for the Cobler buoy only.
21. Dues are collected on the Trevoose Head Trinity light, but no other dues.
23. I believe not.
26. No. By the Merchant Shipping Act, 1854, section 411, it is enacted that "No dues for any lighthouse, buoy, or beacon to be erected or placed in or near the islands of Guernsey, Jersey, Sark, or Alderney, shall be taken in the said islands of Guernsey or Jersey, without the consent of the States of the said islands respectively, nor shall any powers herein-before given to the Trinity House, in respect of any lighthouse, buoy, or beacon, erected or placed in the islands of Guernsey or Jersey, or hereafter to be erected or placed in such islands, be exercised without the consent of Her Majesty in Council."
27. None.
28. Dues are collected, under the control of the Trinity House for lights, buoys, and beacons.
29. Yes.
30. None.
31. Nil.
33. Two shillings and sixpence each for all vessels calling here and anchoring on their voyage to or from foreign parts. One half the sum so raised is paid to the Corporation of Falmouth, one quarter to the lessee of the Bishop of Exeter, one quarter to the Trinity House, out of which the sum of 20*l.* per year is paid to the rector of Falmouth.
35. Yes; light dues are collected at all ports on the River Clyde above the Cumbræ, by authority of the Cumbræ Light Trustees, for the maintenance of lights, buoys, and beacons, from the Cumbræ Heads to Port Glasgow, or Newark Castle just above, or to the eastward of Port Glasgow.
37. Not that I am aware of.
38. Yes; for the Cumbræ lights, one penny per ton on foreign-going ships, and a halfpenny per ton on coasters, both in and out, whether laden or in ballast.
39. Only light dues.
40. Yes; for the Cumbræ lights.
41. The Trinity House of Newcastle collect dues for local lights, buoys, and beacons; and the Commissioners of the Tyne Dues for buoys in the Tyne for moorings.
42. Not being directly interested, and not having given the subject much consideration, I am not qualified to give opinion on these points.
43. Buoyage by the Trinity House.
44. There are no dues for lights or beacons, otherwise than the Trinity collection at this port. Dues are collected for the Cobler buoy from each vessel on entering Plymouth Sound.
45. No dues are collected for buoys; the buoys were placed on the bar and river (since I went to sea), I think, in 1815. Dues were then collected at the Exeter Custom House, and when the Trinity House had received sufficient funds from the collections to pay for the buoys and future contingencies, the dues, first a penny per ton, then one halfpenny, were taken off. Each vessel pays, when passing the beacons, 1*s.* 2*d.* one way.
46. Do not know

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Question

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47. None.
48. Yes. The River Wear Commissioners levy one farthing per ton per voyage on all vessels entering the port for lighthouse duty. For the harbour lights in the River Tyne the Trinity House, Newcastle, levy under the Act 41 Geo 3. c. 86. s. 8. the annexed rates from all vessels coming in or going out of any port or place between Holy Island in Northumberland, and Staiths in Yorkshire, both inclusive. The same authority levies 1s. per ship for the buoys at Holy Island from all vessels trading northward to places between Holy Island and Seaham, both inclusive. Their title to make this latter charge is to me not clear. Rates:—Ships not exceeding 100 tons, per ship, 11*d.*; exceeding 100 and not 200 tons, per ship, 1*s. 1d.*; exceeding 200 and not 300 tons, per ship, 1*s. 3d.*; exceeding 300 tons, per ship, 1*s. 5d.*
49. The Cumbrae Light Trust charge a penny per ton on foreign, and a halfpenny on coasting vessels.
50. Collected by collector of customs.
52. I believe Ilfracombe to be the only place in this channel where any local charge for lights are made.
53. Yes; one penny per register ton on all vessels with cargoes inwards and outwards; and also 2*s. 6d.* per must for what are called anchorage and plankage dues.
54. For the harbour lights and flag a small charge is made with other port charges.
56. I believe not.
57. I am not aware of any.
58. Not aware of any.
62. No.
64. None are levied.
65. No.
66. No.
71. No dues are levied for either lights, buoys, or beacons. The harbour dues cover all expenses.
72. None whatever.
73. Dues are collected for the Cobler buoy by Saltash Corporation, 1*s.* each time the vessel comes into port. This bears heavy on coasters, who make in the summer six to seven voyages to Fowey and back in a fortnight. The dues of the buoy are let by tender.
75. None.
76. No.
77. I know of none; but several passing tolls are collected from ships whose size precludes the possibility of their deriving any benefit.
78. All the dues for the maintenance of buoys and lighting of the River Humber are collected by the Trinity House, Hull.
81. Not that I am aware of.
86. Cumbrae lights, one penny per ton on foreign-going vessels, and one halfpenny per ton on coasting vessels, whether with cargoes or in ballast, and levied both inwards and outwards.
88. There are those I have already spoken of collected by the Earl of Durham. The Trinity House of Newcastle-upon-Tyne also levies dues at Sunderland for the maintenance of the tide lights at Shields, and of the Fairway buoy at the Staple Islands.
89. A penny per ton is levied on foreign-going vessels, both inwards and outwards, and half that rate on coasting vessels, whether in ballast or not.
90. There are moorings west of Turnchapel, in Catwater, the property of the Admiralty, and a great convenience to large ships, there being plenty of water, and the charge moderate; with exception of the Cobler buoy, none other I believe.
91. There are no dues levied for the buoys in the Sound by the Lords Commissioners of the Admiralty, and none for the beacons on the Hoe (Plymouth) by the Trinity House; but the following dues are collected,—
By the Trinity House, for the Edystone light
By the Trinity House, for the Breakstone light.
Both charged together, viz., halfpenny per register ton, if in the foreign trade, and sixpence each vessel if coasting.
94. Not to our knowledge.
95. I am not aware of any, except the charge on ballast, which should be reduced one half, viz., from 1*s. 6d.* per ton to 9*d.* The cost of taking ballast from the ship's hold to the shore is only 6*d.* per ton.
96. Yes; the Cumbrae light dues.
98. The Corporation have a rate of one penny per ton, with one shilling for each vessel, denominated harbour dues and moorage.

II.

103. Buoyage is levied in proportion to register tonnage, once on each voyage (in and out) by the Corporation of the Trinity House, and, I believe, the sums so levied cover all the expenses incurred in the maintenance of the lights established in the Humber.
104. Vessels entering the Tay pay one shilling per ten tons (register), for the use of the Fraternity of Masters and Seamen in Dundee, who maintain the lights, buoys, and beacons.
105. None.
108. None.
109. Special dues are collected by the Trinity House of Hull in respect of buoyage, beaconage, and lights, floating and otherwise, for the navigation of the River Humber.
111. None.
113. None.
114. Not that I am aware.

7. If no Dues are levied or collected avowedly for the maintenance or construction of Lights, Buoys, and Beacons, from what Funds are the Lights, Buoys, and Beacons, to which your evidence refers, maintained?

3. Kirkwall harbour light maintained by the Harbour Trust.
4. From the revenue arising out of the dues levied by the Harbour Commissioners under their Acts of Parliament, called harbour dues.
5. At the expense of the Dock Commission or from their funds.
6. I am not sufficiently informed.
8. Trinity Board.
13. The Newcastle Trinity House collects for buoyage at Holy Island, &c.
14. The lighthouses and buoys of the Tay are maintained by a tax on shipping of 1*s.* per ton, registered tons, on all vessels entering inwards with cargoes or in ballast, and on new vessels outwards.
15. From the harbour funds, as referred to in last question.
17. No dues other than the above, except the Trinity lights.
21. No other lights, &c. to be maintained.
23. The harbour light is supported by the revenues of the Dublin Ballast Board, the river light by the Cork Harbour Commissioners out of their general revenue.
26. The expense of the maintenance or construction of lights, buoys, and beacons within the district is defrayed out of the revenue of the piers and harbours, levied under the control of the before-mentioned committee, by the authority of an Order of Her Majesty in Council.
27. By tonnage and other dues on shipping frequenting the Tyne.
28. As before.
29. Dues are levied.
30. Lights, &c. of River Tay are maintained by a tax of 1*s.* for every 10 (registered) tons of all shipping entering the river, with or without cargoes; also on new vessels going outwards with cargoes on first voyage.
31. No answer.
33. Already answered.
35. The lights, buoys, and beacons on the River Clyde from Port Glasgow or Newark Castle are maintained by the Clyde Trustees, and paid for out of the general fund or dues, known as river and harbour rates, on vessels and goods.
37. One penny per ton is levied on all foreign going ships, coasters one half.
38. See answer 6.
42. Not being directly interested, and not having given the subject much consideration, I am not qualified to give an opinion on these points.
43. Not known; except by primage on inward cargoes.
44. The Cobler buoy is placed on the outer end of the Cobler Ledge west of Mount Batten Castle, it is maintained by an old corporate right from the funds of the Borough of Saltash, who claim from every vessel on entering the Sound one shilling, amounting through the year to several hundred pounds, when the cost of

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Question

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- keeping the buoy could be amply maintained at less than ten pounds per annum; it is also seldom efficient for the purpose of preventing danger to lives and property.
45. See answer 6.
 46. Do not know.
 47. By the Trinity Board.
 49. The maintenance of the lights and buoys is solely out of the before-named tax.
 52. With the exception of Ilfracombe, I infer that the expenses incurred in the construction and maintenance of lights, &c., are paid out of the Mercantile Marine Fund Superintendence by the Trinity House (of course, I except the tide lights of Bristol, Swansea, &c. &c.).
 54. From the harbour fund.
 56. The Mumble light is under the control of the Swansea Harbour Trustees.
 58. From fund collected by the Ballast Board under head of light dues.
 64. The lights, buoys, and beacons are maintained out of the harbour funds.
 65. Swansea Harbour Fund.
 66. Lighthouse Commissioners (Northern).
 71. No dues are levied for either lights, buoys, or beacons, the harbour dues cover all expenses.
 72. Lights, buoys, and beacons are supported from a charge made on the tonnage of ships, which is *4d.* per ton coasting, *6d.* per ton foreign.
 73. Funds are paid by the Trinity House.
 75. The river lights, buoys, and beacons are maintained by the funds of the Harbour Board, the Cork Harbour light is supported out of the revenues of the Dublin Ballast Board.
 76. Trinity House.
 77. All light dues, &c. are now collected by the Trinity Corporation, so far as I know.
 88. The lights, buoys, and beacons within the port of Sunderland are maintained by the Commissioners of the River Wear out of their own revenue.
 90. The Admiralty. The Trinity House, of course, maintains the Edystone light, and, having an agent resident here and a smart cutter, the light is well supplied.
 91. By the Mayor and Corporation of Saltash. For the Cobler buoy, one shilling for every vessel (of whatever size or rig, whether barge or full-rigged ship) which enters the port, whether in ballast or laden, or wind-bound, every time she enters the port.
 94. Unknown to us.
 95. The Trinity House of Newcastle have the keeping of the harbour lights, viz., the high and low lighthouses in the harbour, as well as buoys and beacons on this coast. Tynemouth light by the London Trinity Board.
 96. The lights, buoys, and beacons above Newark Castle to Glasgow are upheld by and paid from the funds of the Clyde Trust, but no separate charge is made therefore. The Cumbrae Light Trustees charge *½d.* per ton coasting, and *1d.* per ton on foreign ships.
 103. Refer to the answer given to the preceding inquiry (No. 6.)
 105. From the funds of Port and Pier Commission and from the dues of the Dock Companies.
 108. From the funds of the Commissioners of the Northern Lights.
 111. By tonnage and other dues on shipping loading in the Tyne.
 113. Out of tonnage and lastage dues, payable to the Mayor, Aldermen, and Burgesses, as such Commissioners, as given to question 3.
 114. From dues charged on shipping.
8. As a payer of Light Dues, do you consider the dues above named excessive or otherwise?
1. Excessive.
 3. Not excessive.
 4. Here we pay the light dues common to all our ports, and I have no reason to consider them excessive.
 6. I think if dues were lessened, which may be done, it would lessen the burden on shipping.
 7. Fair in reference to the services rendered.
 8. Not now excessive.
 10. Although a shipowner, I have nothing to do with the detail of amounts. The Trinity House here publish annually the receipts and expenditure of their Corporation, but I cannot recollect the sums received and disbursed for this particular purpose, but the shipping master, Mr. Henry Corbass, can send you the statement, which gives a full statement. I am not aware of any inequality in their charges; the owners of steamvessels, which are in and out of the port every week, will grumble, but this is really a matter of opinion.
 11. Have not considered the subject.
 13. Moderate; but objectionable so far as paying for Tyne lights by ships not using the Tyne.
 14. I consider the charge excessive.
 15. Not excessive compared with other ports.
 16. The amount collected for the Cobler buoy is excessive.
 17. Yes; particularly the *5s.* charge.
 20. Not excessive.
 21. Trevoe Head light is moderate.
 23. I consider them excessive.
 26. I do not consider the dues levied here excessive.
 27. Amply sufficient.
 28. I consider the dues levied at present a great burden on shipping which (at present in particular) the earnings can ill afford.
 29. Moderate.
 30. I consider the tax excessive, in so far as it exceeds what is required for the proper maintenance of the lights and buoys; this is the general impression and belief.
 31. No.
 33. I cannot say how much the dues levied surpass the cost of maintaining the lights on the coast, but they certainly are a tax on shipping interests. My house in 1859 paid 7,000*l.* *8s.* 10*d.* for light dues on ships calling at this port.
 35. As a payer of light dues, I do consider them excessive, that is, the dues levied by the Commissioners of Northern Lights and by the Cumbrae Light Trustees.
 37. So far excessive that no more should be charged than to keep up the due efficiency of the lights.
 38. Excessive.
 39. Moderate.
 40. I think them excessive in amount.
 41. The dues are not excessive, but capable of modification by a less expensive mode of administration.
 42. I have always thought them reasonable, but my payments are few.
 43. Not excessive.
 44. I consider the charge now made for the Cobler buoy should be entirely abolished, and an efficient one placed on the ledge by the Government authorities free; or it would be more efficient as a safe guide to the entrance of the inner harbour, both for lives and property, if a breakwater was run out on the ledge and a light placed on the end of it, the cost for which would be light, the material in stone being on the spot; the charge of one shilling for each vessel would then be cheerfully paid for entering, and would return a large revenue.
 45. No objectionable charges are made, and the funds collected are properly applied.
 46. Have not considered the subject.
 48. I most decidedly object and oppose the payment by ships not trading to the Tyne for the support of the harbour lights of that river.
 49. They are considered by some too high, as there is a considerable surplus of revenue over expenditure, which, however, is applied to the deepening, &c. of the river, one of the purposes contemplated by the Act.
 50. Except on the general principle, I make no objection, but we are entirely free from light dues in the United States of America, and, I think, ought to be so in England also.
 52. Moderate.
 53. No.
 56. Not excessive.
 57. I consider any charge beyond the cost of maintenance excessive.
 58. Light dues latterly have been considerably reduced. I am of opinion that still further reductions could be made with advantage to the general trade of the country.
 62. No.

8, 9.

Question

9.

65. No.
66. They are very hard on shipping in its present depressed state.
67. Speaking of the English Channel, I do not consider the light dues heavy, taking into consideration the great advantage to the shipping. I should suggest that a light be placed on Durlstone Head near Swanage as a guide for vessels bound through the Needles passage in thick weather, also that a floating light be placed on the Varne and Ridge shoals.
73. I do not consider the dues levied for the lights and buoys are too much.
75. Excessive.
76. I am not a payer of light dues, but during many years' experience as light receiver I have not heard any complaints.
77. Excessive, because a much larger sum is collected from the shipowner than is required for maintaining the lights and the expense of collecting.
78. I do not consider the dues at all excessive, but equal to the services rendered.
81. I pay none.
86. Excessive.
87. As a large payer of light dues, I consider the tax a very unjust one, inasmuch as those lights are for the benefit of the entire trading community of the kingdom and charged alone upon the shipping interest, which are borne down by an accumulation of charges and responsibilities.
88. The Commissioners' dues are moderate. The others are, of course, excessive, little or no return being made for them.
89. They are excessive because they yield five times the amount annually which is requisite to maintain them. As four fifths of this surplus revenue go to the coffers of the Glasgow River Trust, I believe that it will be found that the shipping frequenting the Greenock harbours bear an undue proportion of the tax.
90. I believe the dues paid very moderate; having been engaged in the coasting trade entirely, I have been much pleased with the considerable reductions made in the charge for lights generally, whilst I consider the efficiency of lightage has been more and more increased of late years, and am well aware it is the heavy debts created by the purchase of private lights (perhaps established at higher rates than necessary at the time) which is the mean cause of farther reductions not being yet made.
91. Those collected by the Trinity House moderate and well worth the charge, that for the Cobler buoy excessive and vexatious.
92. Excessive.
93. I am not a payer of light dues.
94. We consider light dues moderate.
95. Moderate.
96. Holding, as I do, the opinion that the charge for lights upon vessels should not exceed the cost, I cannot but consider those for the Cumbrae lights excessive, when I find that the Clyde Trustees had 3,739*l.* odds as their five sixths of the surplus 1857-8, and for 1858-9 2,342*l.*, after expending a large sum for improvements at Toward light. During the ten years ending 30th June 1857 no less than 29,347*l.* had been paid to the Clyde Trustees from the Cumbrae Light Trustees.
98. The rate charged by the Trinity House for the Burnham light, viz., 3*s.* for each coaster and 5*s.* each over-sea trader, is most excessive.
103. I do not.
104. I do not consider the dues paid here too high, and believe that if a paid superintendent and staff were appointed there would not be any excess.
108. They have not appeared to me to be excessive.
108. I do not believe the dues are excessive or otherwise, not having heard any complaints from shipmasters or owners.
111. More than sufficient.
113. I cannot say.
114. They are doubtless excessive, because after the payments made for the maintenance of the lights, Parliamentary Returns show that a large surplus remains, which ought unquestionably to be applied in reduction of the dues, or, rather ought to have been formerly, while none should in future be allowed to accumulate.
9. If you think the charge objectionable, mention any instances in which it presses heavily, or unequally, or unjustly; or any facts in support of your opinion.
1. The amount levied is about four times the sum required for maintaining the lights. The sum raised is about 6,000*l.*, and the average expenditure about 1,200*l.*
 6. The major part may be reduced.
 8. None.
 10. I am not aware of any inequality in these charges; the owners of steamvessels, which are in and out of the port every week, will grumble; but this is really a matter of opinion.
 13. Reasonable, except as to payments to Trinity House of Newcastle.
 14. The charge or tax is objectionable, as it is higher than is required for the efficient maintenance of the light-houses and buoys.
 16. The charge is heavy on all small traders constantly entering the port, to whom, moreover, this buoy is of little use.
 17. The before-mentioned charges for lights and town dues fall particularly heavy on coasters.
 20. I consider the charge presses heavily when vessels put into port for orders and obliged to pay the light dues to the place she is bound to in advance, and before she has had the benefit of the lights, which is unjust and attended with inconvenience.
 21. Do not think the charge excessive.
 23. Light dues, in my opinion, should not be chargeable on the ship, but fairly divided between the ship and cargo (pro rata).
 25. Guernsey and Jersey traders, stone laden, pay light dues every voyage, whilst vessels trading to Plymouth, &c. only pay once a year.
 26. Already answered by what preceded.
 27. No.
 28. The charge for Ramsgate Harbour is particularly objectionable; I am scarcely connected with any ship that could get into the harbour if in distress near it.
 29. No objection.
 31. Nil.
 33. I deem it very desirable that the excess of receipts beyond the annual cost of St. Anthony lighthouse at the entrance of this port be applied for the improvement of Falmouth Harbour.
 35. I think the charges objectionable, because a much larger amount is levied than is necessary for the maintenance of the lights, &c.; and, especially, the dues levied by the Cumbrae Light Trustees press heavily, unequally, and unjustly on all vessels trading to Port Glasgow, inasmuch as the surplus of these dues, amounting on the average to about five times more than are necessary to uphold the said lights, &c., is given, one sixth part to the authorities of Greenock for the improvement of the harbour of Greenock, and the rest, or five sixths, is paid over annually to the Clyde Trustees, who have taken it into their general account, and have expended it in the improvement of the harbour of Glasgow, and of the river above Port Glasgow, and thus the trade of Port Glasgow is assessed in a large amount yearly, from which no benefit arises to that port.
 37. There is a surplus revenue of 4,000*l.* or 5,000*l.* per annum, which is divided between Glasgow and Greenock in the proportions of $\frac{2}{3}$ ths and $\frac{1}{3}$ th, and which is applied to the improvement of the river above Greenock and improvement of Greenock Harbour.
 38. The income of the Cumbrae Light Trust amounts to about 6,000*l.* and the expenditure about 1,200*l.*, the excess, about 4,800*l.* is appropriated as follows, viz., five sixths to the Glasgow River and Harbour Trusts, and one sixth to Greenock Harbour Trust.
 40. They are unjustly oppressive on the shipping frequenting the parts of the Clyde generally, because it is well known that a considerable proportion of the amount collected is applied to other purposes foreign to the proper and efficient maintenance of the lights, buoys, and beacons of the River and Frith of Clyde.
 44. The present charge presses most unjustly on all the small vessels trading to the harbour, a great many of which are in the limestone trade, trading at a small freight,

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Question

9, 10.

- making from four to six trips per week in the summer time, and are compelled to pay one shilling each time of entering the harbour towards the Cobler buoy, when vessels of ten or twelve hundred tons register, entering the port but once a year, only pays the same.
45. No objectionable charges are made, and the funds collected are properly applied.
46. As above.
48. It must be apparent that ships arriving at or sailing from the ports of Blyth, Sunderland, Seaham, Hartlepool, Stockton, Middlesboro', Whitby, or Staiths, cannot receive benefit from the harbour lights within the River Tyne.
49. Do not know of any; mere public opinion sometimes expressed by shipowners.
50. We have a steamer, making a trip a week with coals for our steamers from the Bristol Channel, on which the light dues press very heavily.
51. The charge of twopence per ton register for the light on St. Bees Head annually presses heavily on all vessels trading to ports in the Solway Frith, more especially upon a large number of vessels from foreign ports that only visit these ports once or twice in the year, also a large number of vessels that are built at these ports and take generally pig iron for ballast to Liverpool, which subjects them to payment of this light; these vessels never return again. We return with this memorial that was especially got up, but, owing to a change in the Government, was not forwarded, you can make such use of it as you may deem necessary.—J. J. and Son.

“To the Right Honourable EDWARD CARDWELL, as President of the BOARD OF TRADE, the Petition of the undersigned Shipowners and Shipbuilders, inhabitants of Whitehaven and neighbouring ports, respectfully sheweth,—

“That the charges levied and collected for the Saint Bees Head light press heavily and unequally on the shipping which resort to, and are built in, the Solway Frith, the dues being charged annually, twopence per register ton on all vessels arriving and sailing with cargo.

“That there being a great number of vessels built at Whitehaven, Harrington, Workington, and Maryport that do not return to these ports again, many vessels arrive from foreign ports once or twice in the year, also a number of vessels in the coasting trade that only arrive at the above ports occasionally, yet are all subject to this charge, in fact all coasting vessels pay a sum larger in proportion to this light than is paid to any other in St. George's Channel.

“Your petitioners, therefore, most respectfully beg to suggest that the dues for the above-named light be levied equally with other lights under the management of ‘The Honourable Trinity House.’

“And your petitioners will ever pray, &c. &c.

Name.	Occupation.	Residence.
John Ditchburn	- Shipowner	- Harrington.
Lumley Kennedy	- Ship Builder	- Whitehaven.
Thomas Cormichael	- Shipowner	- Whitehaven.
William Sherwen	- Shipowner	- Whitehaven.
Richard Williamson	- Ship Builder	- Harrington.
George Nelson	- Shipowner	- Whitehaven.
John Hargrove	- Shipowner	- Whitehaven.
Hugh Williamson	- Ship Builder	- Whitehaven.
Thomas Jackson	- Shipowner	- Whitehaven.
Joseph Bragg	- Shipowner	- Whitehaven.
John Hodgson	- Shipowner	- Whitehaven.
Thos. Tadd	- Shipowner	- Fowey.
Benjn. Barwise	- Shipowner	- Whitehaven.
Jonathan Sim	- Shipowner	- Whitehaven.
Ralph Carr	- Shipowner	- Whitehaven.
Isaac Hodgson	- Shipowner	- Whitehaven.
James Hewitt	- Shipowner	- Whitehaven.
Thomas Kelly	- Shipowner	- Whitehaven.
John Jackson	- Shipowner	- Whitehaven.

52. Nothing objectionable or unjust; but to the contrary.
56. None.
58. Might instance the fact of two ships of same tonnage with cargoes valued respectively, supposing 1,000*l.* and 15,000*l.*, charged the same amount for lights. In such a case the rough or unmanufactured goods are heavily taxed, while the valuable are allowed to enter almost free.
66. Ships trading between Leith and Baltic, and those going to the southward, are very heavily burdened.
73. The charges are not objectionable as far as the Trinity is concerned; but the Cobler buoy is an imposition.
75. As a shipowner, I object to pay the full amount of light dues, considering that the cargo should pay its proportion.
76. I do not think the charges excessive.
77. They press upon all merchant shipping most unjustly, for the reasons before stated.
81. I do not think it.
86. Income of Cumbrae Light Trust amounts to about six thousand pounds per annum, the expenditure only twelve hundred pounds, surplus appropriated as under—five sixths paid to Glasgow River and Harbour Trust, and one sixth to Greenock Harbour Trust.
88. See the preceding answers.
89. They are excessive because they yield five times the amount annually which is required to maintain them. As four fifths of this surplus revenue go to the coffers of the Glasgow River Trust, I believe that it will be found that the shipping frequenting the Greenock harbours bear an undue proportion of the tax.
91. Charge for Cobler buoy presses heavily on barges and other small vessels that trade to neighbouring ports, making three or four trips a week with limestones, &c., usually returning light in ballast; and objectionable when charged to vessels which put into port for orders or by contrary winds, and which lie in the outer part of the Sound at a distance, and reaping no advantage from the buoy.
92. Light dues are found to press very heavily on vessels making short and frequent trips. They are unequal and unjust to the English shipowner by reason of the vessels belonging to Sweden, Denmark, Russia, Prussia, Holland, and the Hanseatic Towns, that may load for or discharge cargoes in, the ports of the countries mentioned, when bound to or from any ports of the world, south or west, of our English Channel, using our lights without contributing to the expense of their maintenance.
94. We make no remarks.
95. I am not aware of any unequal charge.
96. This charge must press heavily on all Clyde steamers or traders having occasion to pass up and down frequently; and unjustly on all vessels going to or from Port Glasgow or any other port on the Clyde getting no share of the surplus.
98. The trade of the port is very considerably employed in the direct coasting communicated with ports on the other side of the Channel, and, from the shortness of the voyage, the tax, amounting to usually three times as much as the charge for all the other lights, falls very heavily.
111. From the fact of the increased coasting trade producing much larger funds than required, and ought to be reduced.
113. I cannot say.
114. The prominent instances in which, I think, it presses unequally and unjustly, is in the exemption of ships of Her Majesty's Navy from equal contribution with merchant shipping towards objects in which the state, as owner of ships of war, has an equal interest.
10. If you consider that they are not properly applied, mention any instances of misapplication within your own knowledge, and which you are prepared to substantiate, if necessary.
1. The surplus revenue is given to the Greenock Harbour Trust and the River and Harbour Trust, Glasgow, the former gets $\frac{5}{6}$ th and the latter $\frac{1}{6}$ ths of the surplus.

10.

Question

10, 11.

- Consider all money raised and not applied to the purposes for which it is charged, misapplied.
6. I have no knowledge of misapplication.
8. None.
10. I know of none.
11. What I object to, in the management of the funds of the local Trinity House, that no statement of receipts and expenditure is made public, so that the general public do not know how the funds are applied; but I object to the existence of local Trinity Houses altogether.
13. I have no knowledge of any misapplications.
14. A very considerable proportion of the dues levied on shipping for the lights of Tay are applied in payment of pensions to retired shipmasters and mates and their widows.
16. The dues levied by the Corporation of Saltash are much in excess of the cost of maintaining the buoy, and, I have been informed, are divided amongst the Mayor and Corporation for their private use.
20. I know no instance.
21. Know nothing wrong in that respect.
23. I only object to their amount, and being exclusively charged against the ship.
26. I do not know any instance of misapplication.
27. No.
28. In support of the Ramsgate Harbour.
29. Know of no misapplication.
30. The surplus of revenue, and paying the proper cost of maintaining lights, &c., will, of course, go into the funds of the Fraternity of Masters and Seamen.
31. Nil.
33. I cannot speak on this point generally. See reply to No. 9 question.
35. The revenue of Cumbræ lights, 1853 to 1857 inclusive, is - £28,257 1 3
Expenditure same time - 5,511 0 10
- | | | |
|-----------|------------|-------------|
| Surplus - | 22,746 0 5 | in 5 years. |
|-----------|------------|-------------|
37. There is a surplus revenue of 4,000*l.* or 5,000*l.* per annum, which is divided between Glasgow and Greenock in the proportions of $\frac{2}{3}$ ths and $\frac{1}{3}$ th, and which is applied to the improvement of the river above Greenock and improvement of Greenock Harbour.
40. For particulars of misapplication of funds derived from Cumbræ light duties, see the Annual Financial Reports of the "Clyde Trustees," "Greenock Harbour Commissioners," and "Port Glasgow Harbour Trust."
41. The collection and application of the above dues are under the control of a corporate body, who publish no accounts subject to public opinion, whose management is very expensive, and forms the opportunity of giving lucrative situations to their own body on terms very disproportionate to the duties performed.
41. The money collected from the Cobler buoy is, I consider, misapplied, for the reasons before stated, it not being efficient safeguard for the protection of lives and property entering the harbour of Catwater.
45. No objectionable charges are made, and the funds collected are properly applied.
46. Do not know of any.
48. I am quite clear the sum received from the ships trading to the Tyne will be much more than is necessary for the support of the harbour lights at that port. The revenue received from that port alone will be about 1,000*l.* per annum, that from Sunderland, including Seaham, about 750*l.* per annum.
52. I consider that the funds are well appropriated.
56. None.
57. I do not know of any misapplication beyond the surplus being carried to the Mercantile Marine Fund, from which the shipowner derives no benefit.
67. After a ship leaves the Downs there are but two roadsteads ships can enter for shelter on the south coast of England with a south-westerly wind without being subject to pilotage, viz., Studland Bay and Tor Bay; before the breakwater at Portland ships entered free, but since, pilotage is levied.
73. I have no fault to find respecting the application.
75. I could not substantiate any misapplication of the funds.
76. I do not know of any misapplication.
77. Most grievously misapplied, seeing that the surplus over expenditure is not disposed of as directed by Act of Parliament, say, to the gradual diminution of light dues generally.
81. None.
88. See the preceding answers.
89. They are excessive because they yield five times the amount annually which is requisite to maintain them. As four fifths of this surplus revenue go to the coffers of the Glasgow River Trust, I believe that it will be found that the shipping frequenting the Greenock harbours bear an undue proportion of the tax.
90. I have no objection to make to the application of the funds, indeed I regret that the Trinity Board have not more funds to give to old masters. When the coast trade and best part of the colonial trade was in the hands of the British shipowner I had doubts if the Consolidated Fund should not bear the cost,—but not so now.
91. No objections to the application of the funds in the case of the Trinity House, but in the case of the Cobler buoy have strong objections to the misapplication of the funds. The dues are collected for the mayor and corporation of Saltash (one of the old and effete boroughs) situated four miles from the position of the buoy. The revenue is about 350*l.* or 400*l.* per annum, and the cost of maintenance cannot average more than about 5*l.* per annum, as it is but one buoy moored in five fathoms water, low-water spring tides. No accounts of the income and expenditure are published, and, as the cost of maintenance is so small, it is manifest, that as the corporation of Saltash does nothing more for the benefit of ships that pay the dues or improvement of the navigation of the port beyond maintaining the buoy, the income derived from shipping is spent in matters quite foreign to its legitimate application.
94. We have no knowledge of any inappropriation.
95. I am of opinion they are properly applied.
96. The application of the funds received by the Clyde Trustees being for "improvement of the navigation of the River," cannot, in my opinion, be regarded as a misapplication of them. I am aware, however, that some parties hold different views under the conviction that the Clyde Trustees are bound by the Cumbræ Light Act to commence clearing away any obstructions to the navigation at the point next the sea, and proceed upwards as they are provided with funds for doing so.
109. I believe the funds collected by the Trinity House of Hull are properly applied, but have no means of knowing this, except from rumour or common report.
111. None.
113. I cannot say.
114. I know of none.
11. Speaking generally, and as a payer of dues levied by the three General Light-house Boards in respect of Lights, Buoys, and Beacons, are you satisfied with the operation of the system under which these dues are levied and administered?
1. Not satisfied. No more should be levied than is just sufficient to maintain the lights, buoys, &c. Think the Royal Navy should contribute.
3. In this district I am satisfied. Not well acquainted with others.
4. My experience is too limited to enable me to form a very correct opinion.
6. I am so far satisfied, except that of high charges as at No. 8.
7. We think they should be paid by the country at large, as is done by the American and, we believe, French governments. Foreign owners complain loudly that England does not reciprocate in this respect.
8. Nothing to object to.
9. Ramsgate and Dover dues are very objectionable.
10. No.
11. No, I think the whole system in the country should be under one general management, responsible particularly to the Board of Trade, this would very materially lessen the expense of administration and place the buoyage under efficient control, and enable a large

11.

Question

11.

- portion of the amount now levied for the purpose to be remitted.
13. I think that all ships whatsoever having benefit of lights, buoys, and beacons on the coast should pay for them, and if the payment by foreign ships, our own government ships, and pleasure yachts cannot be obtained, then the whole charges should be paid out of the consolidated funds of the country.
 14. With the exception of local abuses such as the above referred to, I consider the present system of managing the lights, &c. good.
 15. I consider that the cost of lighting up the coast should be borne by the country. I believe there are no objections to the administration of the various boards as the system stands.
 16. I am not satisfied.
 17. The system of levying these charges upon shipping I consider to be unjust to the shipping interest, and are complained of alike by foreign captains and English, and, in my opinion, the light dues ought to be supported by the state.
 19. Generally satisfactory.
 21. We are well content here.
 25. I am.
 26. No. I have to remark that vessels trading from this island to ports in the United Kingdom are subjected in those ports to Trinity and other light dues the same as vessels or foreign or oversea voyages, and in some ports, Liverpool, for example, to heavier tonnage and harbour light dues than are levied on vessels coming from the most remote parts of the United Kingdom.
 27. The system appears to work well, but, in the aggregate, more funds are collected than sufficient to maintain the lights, and the rates ought to be reduced to a sufficiency for an efficient maintenance of the lights.
 28. I am not satisfied.
 29. Yes.
 30. With the foregoing exceptions I am not aware of any objection to the present management of the lighthouse department.
 31. Yes.
 33. I refer to my answers to the special questions.
 35. I am not aware of any objection to the system under which the dues are levied and administered, except that the surplus (and which is a very large one) is not administered to the purposes for which said dues are levied.
 38. Not satisfied.
 39. Yes.
 40. No.
 41. I am not satisfied for the reasons given in No. 10.
 44. In my opinion the light dues in some instances are not justly levied here when vessels put in for orders.
 45. As a firm we hold sixteen vessels and parts of others. I should like to see the dues taken off from British ships, but not from foreigners when we have not equal reciprocity.
 46. I have not paid attention to the subject.
 48. Feeling strongly as I do that it is the duty of all governments wishing to encourage trade and commerce, to make their coasts easy of access, I say it is the decided duty of such government to bear the cost of the necessary lights for such purpose.
 49. Do not consider myself possessed of sufficient information to give an opinion.
 53. I prefer the present system to state management.
 54. I consider the expense of lighting up the coast should be borne by the country.
 56. Yes.
 57. I should be satisfied if the surplus went for reduction of future charge.
 58. No.
 62. Have no objection to the system under which the dues are levied, but do not consider the money so levied is administered to such advantage as it might be to give full benefit of it to the shipping interest by which it is contributed.
 64. I believe the system as a whole works well, but I do not know its details sufficiently to give a decided opinion regarding it.
 65. The only dues that do not give satisfaction are Dover and Ramsgate, and from the numerous complaints I have heard, consider them objectionable.
 66. Yes.
 67. There are many small vessels employed in the fruit and Mediterranean trades that draw more water than many ships of 300 to 400 tons register with cargoes of much greater value from other parts of the globe, hence the unequal tax. To meet the case pilotage dues ought to be levied upon the tonnage of the ship.
 72. The captains frequenting this port, calling at Queenstown or Falmouth for orders, consider the charge heavy.
 74. Yes, generally.
 76. I have not heard of any dissatisfaction.
 77. I cannot be satisfied, for the reasons stated in my reply to Question 10.
 78. I am well satisfied with the system under which they are levied and with the administration generally.
 81. I was while I had to pay them.
 82. Generally speaking I am satisfied with the system under which these dues are levied and also under which they are administered, as far as the cost of their maintenance is concerned, but there is a general impression a portion is expended for other purposes.
 84. As a payer of light dues I have no objection to the system under which they are administered so long as it is thought proper to levy light dues, but I think it unjust to the merchant shipping that they should pay the whole charge and the navy and yachts pay nothing. The proportion due from the navy clearly belongs to the country, and if government are inclined to be generous to the yachts let them do it at the cost of the country, not of a class.
 85. I am not satisfied with the operation of the system, in respect that I believe in the accuracy of a prevailing impression now entertained to the effect that a very large portion of dues now levied is not applied in any way to the maintenance of lights, buoys, and beacons, and, because I think that, if shipowners continue to pay light dues, they ought to be admitted to a share in the management.
 86. Not satisfied.
 87. As a large payer of light dues I consider the tax a very unjust one, inasmuch as those lights are for the benefit of the entire trading community of the kingdom, and charged alone upon the shipping interest, which are borne down by an accumulation of charges and responsibilities.
 88. I think a great deal of the expense of keeping up lights, &c. might be saved, and that the whole of such expense ought to be paid by the nation generally, instead of being thrown on the shipowner.
 89. I am not.
 90. My previous replies have gone into this inquiry, but with respect to the amount paid for the collection of the lights, I beg to state that, in my opinion, the charge for collection should be brought down to the lowest possible extent. The money is brought to the custom house. The collectors of the income tax have but a small poundage, they have to make application for it. "The collection of the lights ought not to form a source of payment to, or emolument for, a government officer."
 - I have imagined that, but for the payment of the lights at the custom house, coasting documents (unless goods in bond on board) should be done away with, and some other mode of paying light money substituted. There is a teasing, unfair practice still kept up in the collection of Dover and Ramsgate dues on coals. The Newcastle chaldron or waggon of coals is 53 cwt., half of a Newcastle chaldron is a London chaldron, and would therefore be 26½ cwt., but we are charged by Dover and Ramsgate collectors for the chaldron of 25 cwt.; where they get this 25 cwt. chaldron from I do not know, but this I know, that we often do not get full 53 cwt. to the Newcastle chaldron. When coals were measured I dare say 25 cwt. of house coal would make a London chaldron, but coals are now sold by weight and not measure.
 91. Trinity light dues are enforced from vessels that arrive at ports of call, such as Queenstown, Falmouth, and Plymouth, and vessels made to pay before they pass or receive the benefit of the lights, for example, a vessel from Galatz (or any other port) comes to Plymouth for orders, and after waiting for some days receives orders to proceed to London, Liverpool, Dublin, Glasgow, Aberdeen, or elsewhere. They make the captains pay the lights from Plymouth to the port of discharge before she leaves Plymouth.
 92. Since the lights of United Kingdom are used by vessels of all countries, the burthen of their support should fall on the country at large and not on the shipowner merely; particularly as the country is pledged to support

11, 12.

Question

12.

- a free trade in shipping, it is unfair to make the British shipowner pay the bulk of the cost of the light service.
94. We are satisfied.
95. I am of opinion that the same advantages might be given at much less expense, and a consequent reduction of the dues levied on the shipowner.
96. I am not sufficiently acquainted with the details of the working of these boards to speak as to the administration, but I see no objection to the system under which they are levied. I have understood that there is a large surplus from the light dues charged upon ships beyond the actual cost of them, and can have no hesitation in stating it is, in my opinion, very unjust to the shipping interest to tax them for lights to any extent beyond the actual cost.
97. I am not satisfied with the present system.
98. I am satisfied with the efficiency of the lights already erected, but I object to the principle which relieves the cargoes carried by ships of any contribution, while the ship (often the least valuable) has to bear the entire cost of maintenance.
101. I am satisfied with the present operation of the system, it would be unfair that the state should bear these dues, because the foreign shipowner would be benefited at our cost, for which we get no return.
103. I have always thought the amount charged by the Commissioners of Northern Lights is excessive, but never knew where to look for address or abatement, and I presume any application (if I had known) would have been useless.
105. No. Light dues are in many cases charged for lights not in the track of the vessel. Vessels properly speaking in ballast are charged full light dues because they happen to have on board some trifling article of merchandise. Larger sums are levied than are required for the maintenance of the lights, the surplus being devoted to charitable and other purposes.
108. I am satisfied so far as I have knowledge of it.
109. Perhaps the union of the boards would promote efficiency and economy, but so far as the working of the system under the Trinity House of Hull it is satisfactory, but there would be no harm in having a superior control from a higher or central authority to promote greater efficiency.
111. The system appears to work well, but in the aggregate more than sufficient dues are collected than appears needful to maintain the lights, &c., and the rate ought to be reduced to such charge as is only required for the above purposes for efficient maintenance of same.
113. I cannot say.
12. If there are any facts within your own knowledge, which you can substantiate if necessary, and which show injurious results from the system above referred to, have the goodness to state the facts.
6. I am not aware of any.
8. None.
13. None within my knowledge.
16. Foreign vessels on homeward voyages are deterred from entering British ports to receive orders, because they are then subject to light dues. The Dover and Ramsgate dues, payable here, operate very prejudicially.
17. In my opinion it affords foreign nations, who act on this principle, a pretext for not abolishing their navigation laws.
21. Frequently mariners mistake the lights, which as practical men they ought not to do, and bad results often occur.
26. The fact that vessels from this island are charged light and other dues in the United Kingdom at the same rate as on foreign or oversea voyages is injurious to the trade in agricultural and other produce from hence to ports in the United Kingdom.
27. None.
28. The want of a lightship on the Varne Sand is the only fact that comes under my knowledge which shows injurious results.
29. Know of no injurious results.
31. None.
33. I refer to my answers to the special questions.
35. I am not aware of anything which I think comes under this question, except what I have stated in answer to foregoing questions.
36. Several vessels have run on shore on Sandguard Fort Beach, in consequence of the inefficiency of the Harwich lights, and some have become total wrecks.
39. None.
40. The heavy charges levied on the shipowner under the existing system for the maintenance of lights, &c., press severely on one particular class, while the whole community participate in the benefits derived therefrom. One serious prejudicial result is the gradual impoverishment of shipowners throughout the United Kingdom; and another, the threat of retaliation thrown out by the Americans in event of our present system being continued.
41. No particular facts beyond those of a general character already alluded to.
44. On vessels putting into this port for orders, they are, on receiving orders for a distant port, obliged to pay the light dues all through, before leaving the port, and if to the eastward, the passing tolls of Dover and Ramsgate. Vessels by such compulsory act may be, (should the orders come of a Saturday evening,) detained until the Monday morning to pay those lights at the Custom House, and thereby lost making her passage, in addition to the injustice of collecting it at the port of call, before having the benefit of the lights, as the vessel may be lost in leaving the port.
46. Have none to state.
48. Knowing that neither the vessels of the Crown, nor even gentleman's yachts are called on to pay any dues for lights, and further knowing that the vessels employed in the large trade from foreign countries to the various continental ports between Brest and Petersburg enjoy the use of the various lights on the coasts without being called on to pay, I say it is unjust to require the mercantile marine trading to the kingdom to pay for their support.
56. None.
58. The collection of light dues works unequally in regard to a port like Dublin, to which vessels may come by two different channels, the north and south; the charge on a vessel coming by the north channel is considerably over that on one coming by the south, the dues being charged according to the number of lights passed.
62. With regard to the bay and approaches to the harbour of Sligo, we consider several buoys, also two leading lights on the bar might be advantageously placed, viz., one large buoy with a bell at Wheaton Rock in Sligo Bay, and several buoys about the bar and shoals in the bay; also, as above named, two leading lights on Lower Point on the bar.
74. It is very inconvenient and injurious that the old regulations respecting the ships of non-reciprocating countries should be continued, as far as the payment of light dues, &c. is concerned, whereby the ships of most foreign nations loading in England for those countries are liable to double lights; for instance, every French ship loading in England for Spain must pay double light dues. I can substantiate many cases of vessels cleared by our firm.
76. I do not know of any.
77. General dissatisfaction of shipowners on account of the Act of Parliament not being complied with.
78. I know of none.
81. None.
82. None.
84. I have heard it stated that vessels calling for orders, and afterwards proceeding to a foreign port, that if foreigners they escape the light dues, but English vessels are compelled to pay on their return to England; if so (and I think it very probable, as I know the Customs regulations are stretched to relieve foreigners), it is, I think, an additional reason why the whole tax should be paid by the country. (I had a master lately who petitioned to be treated as a foreigner, but it was too great a privilege for an Englishman and could not be granted.)
85. I complain of a very obnoxious exaction recently established at Queenstown, Cork. My vessels calling at that port for orders only, have been made to pay light dues at Queenstown to the full amount exigible

12, 13.

Question

13.

at her port of destination. I object to this, because if the vessel did not reach the port of destination, I would have paid dues on lights which the vessel had never passed; and upon making inquiry at collectors of dues, it appears doubtful in such event if a return would be made. Moreover, the collection of dues at a port where the ship does not discharge, and where the shipowner has no funds, subjects him to a payment of five per cent. extra to agents for advance of money, and likewise subjects the ship to grievous detention. If this innovation has been made to secure payment of lights by vessels bound to the continent, it should apply to them alone, and to foreign ships calling at Queenstown, as well as to British.

90. (See answer to Question 11.)

94. We have no knowledge of any injurious results.

95. None.

103. I can hardly say if the remark I am about to make may properly be considered as coming under this head. I think a bell or other apparatus to be sounded in thick weather is very desirable, especially on Flamborough Head. I sustained the loss of a valuable ship at that place in December 1853, which I firmly believe would have been avoided if a bell had been placed there, as she struck the rock close to the lighthouse.

109. I am not prepared with any facts beyond what I have already given you.

111. None.

113. I cannot say.

13. If you wish to suggest any alteration in the system under which the dues last named are levied and administered, here state your views as shortly as possible.

1. The Cambrac lights charge should be reduced to one fourth the present rate, and all light dues made as low as possible, consistent with efficiency.

6. I have no amendment to make.

7. See answer to Question 11.

8. None to suggest.

10. The mercantile marine shipowners invariably complain as an injustice towards them that Her Majesty's ships pay nothing for lights; they also feel themselves at a disadvantage, owing to foreigners not paying here for lights, though they admit that the foreign countries, especially in the Baltic, make no charge. They think that the lights and buoyage should be a charge on the Consolidated Fund, and not on the shipowner; and they further think the Admiralty should undertake all surveys and the responsibility of the buoyage and lights. I gather these observations during my attendances at the Marine Board, when these matters frequently form the subject of conversation; for myself I have no strong opinion on the subject, but I do incline to these views.

11. Alteration partially stated in answer to Question 11, as to the pensions paid by Local Trinity Houses under their charters. It is generally understood that much favouritism is shown, and that pensions are given to non-necessitous people, it is impossible to point out instances, as accounts are not published. I think the pensions awarded to necessitous parties connected with the merchant service, should all be given under control of the Board of Trade; that the pensions should generally be increased.

I think the Commissioners should have given notice of their intention to visit the respective ports last summer, and should, through the Local Marine Boards, have invited parties to appear before them, and give evidence, which would have been more satisfactory than any written replies to printed questions can be. For myself, I can say, that until I saw the steamer carrying the Commissioners in the river Tay, I knew nothing about their coming; and I am of opinion that they did not get a fair sample of the evidence that would have been got here.

13. I cannot suggest what should be done, except as stated in answer to Question 11.

15. Let the charge for lights be set against the country the same as coastguard expenses, and not against ship owners particularly, my reason for this being that the lives and cargoes on board are staked by the nation, and generally of more value—I mean the cargoes, to say nothing of the lives—than the ships that carry them. It may be urged that shipowners are compensated by freights for the expense of lights, as well as for other expenses incurred in order to earn freight, but practically they are not, and by charging it to the country, every consumer of goods would only pay his fair proportion.

16. These dues being levied as much for the preservation of life and for the use of Her Majesty's ships, as for the protection of private property. I think it unjust that they should be levied on private property alone, or at all, the first-named consideration being sufficient to necessitate the construction of lighthouses. The dues are not heavy enough to enter into the computation of the cost of carriage, they therefore become a charge on the freight, and not on the goods carried.

18. General Remarks.—I must observe that there are several lights on the coast which the passing shipping ought not to be charged with, only those vessels entering the said ports, viz., Whitby, Scarborough, Burlington, &c., nor yet places wrongly named harbours of refuge, such as Ramsgate, Dover, &c.; also pier lights and harbour leading lights, which ought not to be charged passing ships, except when they enter the said places. I consider ships calling for orders at outports ought not to be charged light dues until they arrive at their port of destination, except foreign ships bound to the continent. I also must observe that the shipowner should only pay his fair proportion, as the government shipping is exempt, and receives the same benefit as ourselves.

21. I see no fault in the levy of the dues, but I would recommend any master or mate not having a certificate of competence unless he has proved himself thoroughly acquainted with every lighthouse in the kingdom.

26. I think that no higher dues ought to be levied in ports of the United Kingdom on vessels entering them from the Channel Islands than are levied upon vessels entering from the neighbouring ports of Weymouth, &c. in the English Channel.

27. No. 11 answers this.

28. Considering the competition shipping is now exposed to, and the difficulty they have in making the round voyages remunerative away from the non-reciprocating principles of foreign countries, whose shipping is so much benefited on their round voyages, by British shipping being excluded from a part of it. If this policy is carried out and avowed on the principle that the general community of Britain benefit by it, seeing that the shipowner has to pay his share of the general burdens of the country, in fairness he should not be required to bear the special burden of lighting and buoying our coasts alone, in addition to his share of the general burdens; but the lighting and buoying should, in my opinion, become part of the general burden of the country, and be paid from the Consolidated Fund.

29. I have no suggestion for any alteration, further than with due efficiency of lights, buoys, and beacons, economy of collection of the dues and expenditure, should be strictly enforced, so that no more dues may be charged to the vessels than the efficiency may require.

31. Nil.

33. I refer to my answers to the special questions.

35. I have nothing to suggest in answer to this question, except to state my clear and firm conviction that the light dues, &c. here referred to, as well as the light dues, &c. throughout this kingdom, should be reduced to a rate fairly sufficient to maintain all existing lights, buoys, and beacons, and to erect such additional lights, &c., as may from time to time be found necessary, and that the rates on all classes of vessels passing said lights, buoys, and beacons, should be equitably assessed, according to the use which said vessels may make of the lights, &c. and to the benefit they may receive therefrom.

38. No more dues should be levied than what are actually required for maintaining the lights, buoys, and beacons in an efficient order. The dues should be levied on the cargoes as well as on the ships, and also on national ships using the lights.

13.

Question

13.

40. I think that the expense of erecting and maintaining the lights, buoys, and beacons of the United Kingdom should be borne by the nation.
41. I think all the lights, buoys, and beacons in the kingdom should be under the control and management of a public board appointed by government, who should publish yearly statements, and be amenable to Parliament; and that no higher dues should be levied than are absolutely necessary for their establishment, and for their economical and efficient working.
42. Have heard wishes expressed for a light on the island of Jura, at the Iron Rock, about two miles east of small isles of Jura, where there is now a beacon.
44. I would suggest that the light dues ought not to be collected before the vessel arrives at her port of destination, and the freight earned; and the passing tolls for harbours that are not seen by the crews of the vessels passing them once a year should be abolished altogether.
46. Have none to suggest. I have never paid attention to the subject of light dues, &c., and feel myself incompetent to give opinions on the above questions.
48. Whether or not the cost of lights are born by the Consolidated Fund, I would suggest the amalgamation of the three existing boards into one responsible and efficient one, as I am quite sure a very large saving of the present cost would thereby be made. By this course the peculiar anomaly of the varied instructions to the different collectors would be avoided, those of one board being to charge vessels the duties for the most costly route where two are available; another defines the route for which a ship shall pay, whether circumstances may prevent such being taken or not. The arbitrary decision as to what light duties vessels bound to specific ports are called on to pay is best defined by the following facts:—Two ships sailing hence, the one to Boston and the other to Bedford, both ports in the United States, and only distant from each other about 30 miles, and their destination upwards of 3,000 miles from this port, it is laid down that both shall navigate north about through the Pentland Frith, that the one shall navigate past the north end of the island of Lewes direct to the Atlantic, whilst the other shall only commence to cross the Atlantic after she has passed through the Minch, or, in other words, she must pay for all the lights between the western islands and the main land of Scotland almost as far as the Mull of Cantire. From all the inquiries I have made I have never learnt of any vessel whose destination was any port beyond Great Britain having ever attempted to navigate this Channel in preference to passing direct to the Atlantic by way of the Butt of Lewis.
54. I would suggest that the charge for lights be set against the country same as the coastguard charges, and not against shipowners. The lives and cargoes on board are staked by the country, and the latter is generally of more value than the vessels. The light dues being charged to the country, all consumers of goods would pay a fair proportion of them.
55. I refer to the answer given to this query by J. K. Wishart, Esq., of Leith, and adopt it as my answer.
56. None.
57. I consider Her Majesty's ships should contribute the same as merchant ships.
58. I am strongly of opinion that the system of levying light dues on ships ought to be abolished altogether, and the lighthouses of the country supported from some other fund. I consider it would be almost impossible to estimate the fair proportion of dues to be paid between cargo and ship. You might instance as an argument for the abolition, the abandonment of the turnpike system in these countries.
62. To be administered all for the benefit of navigation and shipping in lights, beacons, and buoys, and none of the money levied on such to be otherwise appropriated.
64. I think the parties paying the dues ought to have some control over their collection and administration, by being represented at the different boards; and also, that a sum ought to be paid from the Consolidated Fund equivalent to the amount of dues which vessels of the Royal Navy would pay, were they liable, as merchant vessels are.
66. Ships should have leave to compound for a fixed sum per register ton per annum.

67. The pilotage is the heaviest and most unequal tax the small foreign-going shipping of this country has to bear. Example:—“Empress” of Shoreham, Ennew, Master, 93 tons register, in from Tercena, freight and charges as follows:—

		Inwards.		£ s. d.	
Gross freight	-	-	-	219	12 0
Putting pilot on board in the Downs	-	-	1 2 6		
Pilotage, 9 ft. 6 in. water	-	-	5 17 6		
Dover dues	-	-	0 11 8		
Ramsgate	-	-	0 8 9		
Trinity lights	-	-	1 4 11		
			<hr/>	9	5 4
		Outwards.		£ s. d.	
Ramsgate	-	-	0 8 9		
Pilotage, 8 ft. 6 in.	-	-	5 16 6		
Landing pilot	-	-	0 10 0		
			<hr/>	16	0 7
				203	11 5

Out of which the owner has to pay foreign port charges, stowing the cargo, provisions, wages, wear and tear, commissions, and sundry other small charges. Most vessels employed in the fruit trade of this size draw upon an average 11 to 12 ft. water. All these charges are compulsory, except the landing pilot, which the captain can do in his own boat.

71. I have nothing further to add, beyond what is contained in my letter of 27th May last, and that addressed to Mr. Dunbar.
76. I am not aware that any alteration is necessary.
77. All lights and buoyage dues ought justly to be paid by the public, as they are in other civilized countries. They ought not to be borne by shipowners only, seeing that ships of Her Majesty's navy participate in all the advantages, and contribute nothing towards their support.
78. I would suggest that the cost of lighting the coasts should be defrayed by the country in general, and not by the shipowners in particular.
80. I consider, without going into particulars, that the whole of the lights should be a charge on the Consolidated Fund, and not an exclusive charge on the shipowner.
81. I have nothing to suggest.
82. None.
83. I would suggest that the dues in question be paid out of the national funds, and not by shipowners alone.
86. No dues should be levied, except such as are actually required for the maintaining the lights, &c. in efficient order. The charge should be levied on cargoes as well as on ships, and also on the national ships using the lights.
89. It would be consistent with the course lately pursued in commercial matters if the maintenance of lights became a charge on the national funds. This would be a felt relief to the British shipowner, for although the foreigner equally pays the tax, it is in our own harbours, if anywhere, that we possess an advantage over him.
90. (See answer to Question 11.)
91. I suggest that the lights are not due, therefore should not be collected till, by arriving at her port of discharge, she has passed and received the benefit of them.
94. We cannot suggest any alteration.
95. The system under which the dues are levied appear to me satisfactory.
96. The only suggestion I would take the liberty of making is that the expenditure connected with lights, &c. on the coast should be managed with the strictest economy consistent with efficiency, and that the charge should be no more than cover the cost. It occurs to me that, in order to this end, it would be desirable to give full publicity to all the items of charge and discharge connected with the various boards. The three lights under the Cambrae Light Trust are kept up at an annual expense of some 1,200l. or 1,300l. per annum. If the public were furnished with a detailed statement of the cost of each lighthouse, no serious defalcation or mismanagement could occur without being at once apparent.

13.

Question

13.

97. That all light dues should be paid out of the Consolidated Fund as in America and other countries.
98. See answer to Question 11.
103. I had rather see the coast lights, &c. generally under the management of the Trinity House Deptford Strond, than under the control of the Commissioners of Northern Lights and the Ballast Board, were it not for the idea which I entertain that a large portion of the Trinity House funds is expended for the benefit of the Elder Brethren, &c. rather than for maritime or commercial purposes. The lights, buoys, and beacons of the river Humber cannot, I think, be managed better or more cheaply than they are at present.
104. I do not object to the present system of light dues, and would consider their repeal as another boon bestowed on the foreigner, which would enable him to compete with us still more successfully.
105. That the lights, buoys, and beacons be maintained under a system securing the strictest economy consistent with efficiency. That the funds collected be applied strictly to and for no other purpose than that for which they are levied, and no higher rates charged than requisite. Ships only charged for lights in her track. That light dues be not levied on ships having only trifling articles on board in addition to her ballast.
108. I consider that in the Board of Commissioners of the Northern Lighthouses, the shipping and commercial interests of the country are not represented as they ought to be.
109. No suggestion to make.
111. Answered in No. 11.
113. No suggestion to offer.
114. Only in respect to Questions 8 and 9.

ABSTRACT OF MERCANTILE MARINE EVIDENCE.

THE COMMISSIONERS APPOINTED BY THE QUEEN TO INQUIRE INTO THE CONDITION AND MANAGEMENT OF LIGHTS, BUOYS, AND BEACONS,—NAMESLY,—&c.; BY VIRTUE, &c., request that you will be so good as to answer the following questions as concisely as you can, if you are practically acquainted with the subject, and return the Paper with as little delay as possible, unpaid, to

J. F. CAMPBELL, *Secretary.*
7, MILLBANK STREET, WESTMINSTER, S.W.

SPECIAL QUESTIONS.

Please to direct your attention to the distinction drawn between Special and General Questions, in case your experience enables you to answer one set rather than the other.

NUMBER OF QUESTION.	TOTALS OF ANSWERS AND BLANKS.		ABSTRACT.
			NAMES.
1. Have the goodness to write your name, state your occupation, and give your address.	144		
2. If your evidence is intended to apply to any one particular locality, here write the name of the port, place, or district to which your answers refer.	Answers 114	90	Name 45 separate localities, namely, Aberdeen, 3; Ardrrossan, 1; Belfast, 1; Bristol Channel, 4; Bridgewater, 1; Boston, 1; Clyde, 10; Cork, 2; Dundee, 4; Dublin, 2; Exmouth, 2; East Coast and English Channel, 1; Falmouth, 2; Frith of Forth, 2; Foyle River, 1; Greenock, 1; Glasgow, 1; Hull, 5; Harwich, 2; Hartlepool, 1; Ipswich, 1; Jersey, 2; Liverpool, 3; London, 3; Leith, 2; Milford Haven, 1; Newport (Monmouth.), 1; Newcastle-upon-Tyne, 2; Orkney, 1; Plymouth, 6; Padstow, 1; Shoreham, 1; Sunderland, 5; St. Helier and Bay of St. Aubyn, 1; Shields, 3; Stockton, 2; Swansea, 2; Sligo, 1; Solway Frith, 1; Tyne, 1; Tenby, 1; Whitby, 1.
		24	Do not name localities.
3. Give the title and address of any authority, resident or otherwise, exercising control over or responsible for the efficiency of the lights, buoys, or beacons, in the place to which your evidence applies.	Answers 76 Blanks 38 — 114	28 41 7	Name Local Authorities. Name the General Authorities. Nil.
4. Judging from facts within your own knowledge, or from your own experience, how is the service conducted by the authority having the management of or control over the lights, buoys, or beacons above referred to?	Answers 76 Blanks 38 — 114	70 3 3	Favourable. Unfavourable, see 71, 88, 91. Nil.
5. So far as you are informed, what is the opinion generally expressed by master mariners frequenting the place above-named, as to the efficiency and sufficiency of the lights, buoys, and beacons above referred to?	Answers 83 Blanks 31 — 114	63 16 4	Favourable. Unfavourable. Nil.
6. Are any dues levied or collected at the port or place avowedly in respect of lights, buoys, or beacons, other than dues collected for lights, &c., under the control of the Trinity House Commissioners of Northern Lights and Ballast Board?	Answers 74 Blanks 40 — 114	74	Name 15 localities in which local dues are levied, namely:— Aberdeen. Milford Haven. Bridgewater. Newcastle-on-Tyne. Clyde. Plymouth. Cardiff. Shields, North. Dundee. Shields, South. Falmouth. Sunderland. Iffracombe. Stockton. Liverpool.
7. If no dues are levied or collected avowedly for the maintenance or construction of lights, buoys, and beacons, from what funds are the lights, buoys, and beacons to which your evidence refers maintained?	Answers 53 Blanks 61 — 114		See Answers of which no abstract can be made.

NUMBER OF QUESTION.	TOTALS OF ANSWERS AND BLANKS.	ABSTRACT.	
8. As a payer of light dues, do you consider the due above named excessive or otherwise?	Answers 71 Blanks 43 <hr/> 114	30 36 5	Excessive. Otherwise. Nil.
9. If you think the charge objectionable, mention any instances in which it presses heavily, or unequally, or unjustly; or any facts in support of your opinion.	Answers 50 Blanks 64 <hr/> 144	31 15 4	State general objections and mention cases. Satisfied. Nil.
10. If you consider that they are not properly applied, mention any instances of misapplication within your own knowledge, and which you are prepared to substantiate, if necessary.	Answers 46 Blanks 68 <hr/> 114	13 32 1	Name instances of improper application of funds. Otherwise. Nil.

GENERAL QUESTIONS.

11. Speaking generally, and as a payer of dues levied by the three general light-house boards in respect of lights, buoys, and beacons, are you satisfied with the operation of the system under which these dues are levied and administered?	Answers 72 Blanks 42 <hr/> 114	24 44 4	Satisfied. Otherwise. Nil.
12. If there are any facts within your own knowledge, which you can substantiate if necessary, and which show injurious results from the system above referred to, have the goodness to state the facts.	Answers 38 Blanks 76 <hr/> 114	15 23	State such facts Do not.
13. If you wish to suggest any alteration in the system under which the dues last named are levied and administered, here state your views as shortly as possible.	Answers 60 Blanks 54 <hr/> 114	35 24 1	Suggest alterations. Do not. Nil.

CIRCULAR No. VIII.
MARINERS' EVIDENCE.

Total numbers of Papers issued	-	-	-	-	about 3,000
Number returned, filled up	-	-	-	-	793
Number of answers printed	-	-	-	-	14,791

Papers were subsequently returned which make up the number of Witnesses to 814. The last 21 are printed at the end.

The Evidence is thus arranged—

	Pages.
1st. An alphabetical list of the names of the witnesses, with an Index number attached to each, and letters showing the employment of each witness, such as P pilot, M master, F M foreign mariner	446
2nd. The Index numbers arranged consecutively and followed by the replies to questions 35, 36, 33, 34, 1, 2, which relate to the witnesses, their means of knowledge, and their experience	449
3rd. All the answers given to each of 30 questions arranged together under each question	480 to 578
4th. An appendix of returns received too late for insertion	579 to 585
5th. An abstract showing the number of replies given to each question, arranged under heads to which the answers seem applicable, such as <i>affirmatives</i> , <i>negatives</i> , &c. with deductions from the evidence	586 to 588

Note.—In order to find the evidence of any one witness—

- 1st. Find his name in the alphabetical list.
- 2nd. Under the Index number there given, search in the list of witnesses for answers to 35, 36, 33, 34, 1, 2.
- 3rd. Under each question, and under the same Index number, search for the replies given.

Where no reply was given by a witness to any particular question his Index number is there omitted, is counted as a blank.

ALPHABETICAL LIST OF WITNESSES.

- A.
- M. 200. Abrams, Wm.
M. 119. Adam, Wm.
M. 440. Allan, Andw.
M. 437. Abernethy, John.
RN. 709. Allen, H. W.
M. 727. Anderson, Edwin.
M. 624. Anderson, James.
M. 376. Anderson, Robt.
P. 565. Anderson, Robt.
M. 228. Anderson, Thos.
M. 621. Angel, Thos. E.
M. 381. Ansell, Wm.
FM. 193. Andrews, G. F.
P. 98. Andrew, Richd.
M. 302. Andrews, Wm. Stn.
M. 286. Appleyond, Abm.
M. 485. Askey, Benjn.
M. 500. Aitken, Jas.
Mer. 523. Adri, Thos. M.
RN. 682. Aldricks, Geo. S.
RN. 10. Alldridge, Geo. M.
P. 44. Atkinson, Wm. F.
Mer. 110. Alcock, Chas.
P. 303. Alcock, E. H.
P. 232. Aton, Wm.
P. 5. Arnold, J. W.
P. 226. Arnold, Edw.
P. 224. Austin, Geo.
RN. 789. Aylen, Juna.
- B.
- M. 749. Babor, Geo.
FM. 164. Backer, L.
M. 165. Baird, Thos.
P. 396. Baker, Geo.
M. 790. Baker, Chas.
P. 611. Bark, John.
FM. 619. Barker, Geo.
M. 505. Barrow, Edw.
M. +98. Bartlett, John.
M. 194. Bastard, Wm.
M. 772. Bawen, John.
M. 382. Bawden, Geo.
M. 346. Baxter, Robt.
M. 133. Bayley, Edw.
M. 327. Blake, John.
P. 4. Bramston, Geo.
RN. 668. Braund, W. P.
M. 725. Beaton, John.
M. 75. Beaumont, Benjn. P.
M. 571. Becker, Fredk.
S. 91. Bedford, E. J.
RN. 13. Bedford, Geo. A.
M. 634. Beletree, Richd. J.
M. 247. Bell, Hy.
M. 627. Bell, John R.
P. 679. Bell, John R.
M. 411. Belyca, C. A.
M. 170. Benfield, John.
Y. 570. Bentinck, J.
M. 568. Bevis, T. N.
RN. 675. Bichout, Hy.
RN. 649. Biddlecombe, Geo.
M. 483. Bilton, Lewis.
M. 474. Bishop, Wm.
M. 272. Biurek, John.
RN. 791. Blammont, J. A.
M. 597. Bliss, Eli C.
M. 486. Briggs, Luther J.
M. 297. Briggs, Robt.
M. 604. Boucher, Philip.
RN. 701. Bouchier, W. S.
S. 225. Bowen, Geo.
M. 447. Bowman, Wm. B.
P. 56. Bowyer, Jas.
M. 506. Brockbank, Benjn.
RN. 705. Brockman, Geo.
M. 204. Brodie, Oswald.
FM. 431. Brown, David.
M. 763. Brown, Geo.
M. 417. Brown, John.
RN. 704. Brown, J.
M. 277. Brown, Peter.
YB. 263. Brown, Thos.
M. 220. Bulley, Thos.
M. 235. Bulmer, Mark.
M. 208. Burn, John.
M. 744. Burne, Geo. Chas.
M. 465. Burns, Hy.
FM. 173. Burton, Wm.
M. 451. Burton, Wm.
M. 509. Bush, Richd.
M. 295. Bushell, John.
M. 367. Bussell, Hy. C.
P. 47. Butcher, Geo.
M. 442. Bruce, Jas.
- C.
- P. 40. Cable, Willm.
P. 60. Calver, Jas. S.
- RN. 7. Calvers, Edward K.
- M. 240. Campbell, Geo.
M. 254. Campbell, Wm.
M. 383. Campbell, Wm.
M. 295. Cameron, John.
M. 223. Canlirs, Thos.
M. 563. Cargill, Wm.
M. 433. Carrington, John.
M. 300. Carter, Danl. Draper.
P. 252. Caws, Silas Harvey.
P. 248. Caws, Walter.
M. 425. Chambers, Wm.
L.A. 753. Chapman, Hy. C.
P. 126. Chard, John.
SO. 366. Clachar, Alex.
M. 452. Charles, Wm.
M. 665. Clark, Jas.
M. 336. Clark, John.
P. 3. Clark, Wm.
M. 97. Clark, Wm.
RN. 660. Craigie, D.
M. 139. Crane, Jas.
M. 567. Crane, Wm. Hind.
M. 130. Crawford, R. W.
M. 192. Cleghorn, T.
M. 577. Chester, Jas.
M. 731. Chew, Richd.
L.A. 753. Chianery, Wm.
C.E. 267. Cligram, Wm.
M. 562. Christie, Edw.
M. 154. Christie, John.
M. 494. Christopher, John.
M. 217. Coates, Wm.
P. 78. Cook, Jas.
M. 181. Collins, Chas.
M. 299. Connell, Jas.
M. 771. Cooper, Edward.
M. 321. Cormack, Jas.
RN. 144. Cotter, Hy.
M. 428. Coulter, John.
M. 128. Cow, John.
M. 249. Cowan, Archd.
M. 159. Cowan, Robt.
RN. 12. Cox, Hy. L.
P. 70. Crock, Edward.
M. 467. Crodder, Mendal.
SO. 528. Crossie, J. R.
M. 227. Cross, J.
M. 347. Cross, Herbert R.
M. 672. Cross, Herbert R.
M. 355. Crowall, M. B.
P. 135. Cullis, Wm.
M. 223. Cumming, Peter.
M. 275. Cumming, Robt. Elson.
M. 212. Cuthbertson, John A.
FM. 599. Cutler, A. Greely.
M. 752. Curling, Wm.
M. 516. Crundell, Jas. A.
P. 776. Crute, Jas.
- D.
- FM. 188. Dalitz, F. F.
M. 309. Dane, Edward.
FM. 146. Dannenberg, R.
P. 74. Dash, John.
M. 161. Davey, Philip J.
M. 394. Davies, Capt. John.
M. 718. Davies, Thos.
M. 257. Davies, Wm.
M. 693. Davis, C. E.
P. 100. Davis, Thos.
M. 393. Davis, Wm.
P. 2. Davison, John.
M. 59. Dawson, Thos.
M. 61. Dawson, Wm.
M. 348. Deans, Wm.
M. 721. Deans, Wm.
FM. 412. Debert, G. M.
FM. 409. De Jonge, D. T.
M. 481. Dempsey, Edw.
P. 276. Denham, Jonas.
M. 390. Dent, Robert.
89. De Ros, Lord.
M. 140. Dickinson, Thos.
P. 303. Disney, Hy. Beverley.
M. 315. Dixon, Isaac.
M. 545. Diney, George.
M. 579. Dodd, Peter Dixon.
M. 94. Donal, Robert.
M. 258. Donnan, Geo. M. K.
M. 400. Donohoe, John.
SB. 386. Douglas, John.
M. 468. Dowell, Geo.
M. 643. Dudley, Anthony.
M. 429. Duff, Thos.
M. 301. Duff, Thos., junr.
M. 745. Dundas, Robt. Thos.
M. 360. Dun, John.
M. 413. Dunn, Thos.
M. 459. Dunlop, Jas.
- E.
- P. 112. Eddy, John.
RN. 8. Eddy, Adolphus Geo.
M. 108. Elliott, Wm.
RN. 684. Ellis, H. T.
M. 283. Emberton, Wm. H.
M. 149. Emery, Robt. T.
M. 736. Emeson, Thos. H.
M. 686. Etlary, W. H.
M. 155. Evans, Chas.
P. 86. Evans, Danl.
M. 697. Evans, Evan. (Capt.)
M. 729. Evans, R. W.
M. 41. Ewing, Thos.
- F.
- M. 229. Fairbairn, Danl.
M. 723. Fairfield, D.
M. 353. Farley, Ph.
M. 250. Farrell, John.
M. 767. Farquhar, Alex. B.
M. 416. Fraser, David.
M. 787. Fell, John.
M. 738. Ferguson, J. W.
P. 774. Frederick, John.
M. 601. Freeman, Thos. F.
M. 542. French, A. P.
M. 475. Field, Jas. Edwd.
FM. 153. Figtuh, P.
RN. 401. Fitz Roy, Robt.
M. 215. Fitzsimons, Geo.
M. 578. Follett, Saml.
M. 632. Forrest, Wm.
M. 419. Foskey, Chas.
M. 525. Foster, Jas.
M. 385. Fowle, Geo.
FM. 180. Frost, Chas.
M. 279. Fudge, Robt. John.
P. 64. Fuller, Wm.
M. 252. Furner, Wm. Hy.
M. 408. Flynn, M.
- G.
- RN. 683. Gahan, Charles.
M. 174. Gales, T. E.
M. 201. Gambvill, G.
M. 137. Garwood, E.
M. 37. Graham, Dugald.
M. 233. Graham, George.
M. 186. Graham, Wm.
Surv. 361. Graham, Wm.
R. Mas. 259. Gray, John.
P. 630. Gray, Joseph.
M. 714. Geary, H. W.
M. 395. Gregg, Henry.
M. 215. Greive, Joho.
M. 379. Green, Joseph.
P. 45. Green, Philip Fras.
P. 125. Green, Richd.
P. 310. Greenham, Geo.
M. 373. Grey, John.
M. 308. Gibson, John.
P. 32. Gibson, J. S.
RN. 679. Giles, Geo.
M. 735. Gilham, Wm.
P. 43. Gill, Hy.
M. 493. Gilles, Jacob.
P. 95. Gilmore, Abm.
P. 68. Girling, Wm.
P. 120. Glinn, Wm.
M. 558. Griffin, Edwd.
M. 720. Griffiths, John.
M. 197. Good, John.
M. 759. Goodridge, Jas.
M. 449. Goodwin, R. B.
P. 31. Golden, J. A.
M. 633. Goddack, D. M.
M. 445. Gordon, Robt.
M. 760. Gorman, Timothy.
M. 438. Gould, Edwd.
SO. 131. Gourley, Edwd. T.
- H.
- M. 313. Hacking, Joho.
M. 476. Hall, Wm. B.
M. 702. Hall, W. G. S.
M. 135. Hallet, Franklin.
M. 499. Halliday, Archd.
M. 605. Hammack, John Jos.
M. 592. Hamilton, Wm.
M. 473. Harcus, John.
RN. 743. Harding, John.
M. 357. Harrington, Jacob Dixon.
Retired Master. 114. Harrison, John.
M. 234. Harrison, John.
- M. 586. Harrison, John.
M. 260. Harry, Thos. Kneetts.
FM. 785. Harward, Wm. T.
M. 320. Harvey, H. B.
P. 82. Harvey, Thos.
M. 364. Harvey, Wm. W.
M. 370. Haswell, John D.
M. 504. Hautes, Saml.
M. 172. Haussen, John L.
FM. 162. Haussen, Christian.
RN. 773. Hay, John.
M. 297. Hay, Mathew.
M. 453. Hayes, F. T.
M. 552. Hayes, Edwd.
P. 50. Hayward, Wm. G. F.
RN. 658. Heatter, Geo. P.
M. 259. Bennett, Robt.
M. 213. Henderson, Thos.
M. 640. Henderson, Wm. J.
RN. 635. Henning, Alexr.
M. 498. Henry, John.
RN. 688. Henwood, T. B.
M. 418. Herbert, John.
M. 139. Heron, Chas.
M. 484. Herron, John.
M. 534. Hesse, Carl.
RN. 706. Hetton, Mark.
M. 198. Heyler, Giles.
M. 637. Hicks, Geo. Wm.
M. 195. Hight, Edwd.
M. 116. Higgs, Wm. Fredk.
M. 280. Hill, Alexr.
M. 580. Hillman, Philip.
M. 168. Hindson, Jas.
M. 742. Hinothaugh, Mattw. Wilson.
M. 436. Hire, Fred. B.
M. 584. Hoekle, E. M.
M. 138. Holland, Richd.
M. 317. Honey, H. R.
M. 508. Hood, G. H.
RN. 700. Hooper, B. J.
P. 265. Hoppins, John.
P. 288. Hoppins, Joseph.
RN. 764. Hore, E.
Mer. 543. Hosencon, Jas. L.
RN. 784. Hoskin, Jm.
M. 533. Hoskins, Wm.
RN. 282. Hoskin, Rd.
RN. 782. Hoskyrs, R.
426. Hosmeys, J. T.
M. 654. Howe, Geo. Wm.
M. 88. Howling, Thos.
M. 237. Hudson, Jeremiah.
M. 287. Hudson, R. H.
M. 289. Hughes, D.
P. 609. Hughes, W.
M. 540. Hunkin, Thos. Cloke.
M. 124. Hunt, Jas.
P. 19. Hurst, Robt.
M. 497. Hussey, E. A.
RN. 875. Hutchings, John.
M. 105. Hutchison, Wm.
- I.
- M. 156. Inclendon, Philip, K.
P. 630. Ingo, Hy.
P. 6. Iron, Richd.
M. 333. Irvine, Wm.
MF. 602. Ivey, Wm.
- J.
- RN. 666. Jago, D. M. D.
M. 250. James, David.
Y. 298. James, Jas.
P. 273. James, Jno.
FM. 191. Jardan, Wm.
M. 441. Jean, F. G.
M. 555. Jellicoe, John H.
P. 117. Jenkin, Nichs.
M. 179. Jenkins, F. E.
M. 734. Jenkins, John.
M. 574. Jewson, Wm. Gilbert.
M. 391. Johnston, B.
M. 480. Johnston, Edward.
M. 503. Johnston, Wm.
M. 472. Johnston, Wm.
RN. 689. Johnston, Wm.
M. 658. Jones, Chas. M.
P. 92. Jones, Daniel.
P. 92. Jones, Danl.
M. 492. Jones, David.
M. 554. Jones, David.
P. 616. Jones, Hugh.
P. 37. Jones, John.
M. 339. Jones, John.
P. 734. Jones, John.
M. 251. Jones, John M. S.
M. 526. Jones, Mattw.
M. 380. Jones, Philip.

- M. 266. Jones, Richd.
 P. 35. Jones, Thos.
 P. 93. Jones, Thos.
 M. 462. Josephson, H. S.
 M. Julius, Theodore.
- K.
- RN. 711. Keane, Edward.
 M. 160. Keats, Richard.
 M. 626. Key, Thos.
 M. 739. Keer, John.
 M. 429. Kelly, Tim.
 M. 628. Kennedy, Jas.
 M. 669. Kennedy, Jas. B.
 M. 673. Kerr, David B.
 M. 246. Kerr, Thos.
 M. 18. Kidé, Geo.
 M. 178. Kidd, Jas.
 M. 443. Kiddie, Jas.
 M. 281. Killock, Adam.
 P. 20. King, Abel.
 P. 49. King, Chas.
 P. 29. King, Chas. Leggett.
 M. 483. Knight, Hy.
 FM. 182. Korner, J.
 M. 689. Krocke, Wm.
 FM. 167. Kriger, J. H.
 M. 551. Krüger, Henry R.
 M. 554. Krüger, J. E.
- L.
- M. 595. Lackland, Jas.
 M. 1. Lacy, T. B.
 P. 737. Lamaster, W.
 M. 403. Lamb, Edward.
 M. 444. Langcake, Wm.
 M. 625. Langlands, Joe.
 P. 590. Langlois, Jas. H.
 M. 206. Largie, Andrew.
 P. 36. Larkins, Stephen, N.
 M. 162. Lawrence, Alex.
 M. 118. Lawver, R. M.
 P. 26. Layton, Thos.
 M. 786. Lee, Wm.
 M. 358. Leetham, Jas.
 P. 27. Leggett, Henry.
 P. 24. Leggett, Thos.
 P. 691. Leitch, John.
 Y.O. 284. Leslie, W. B.
 M. 129. Lewis, Thos.
 M. 293. Liddell, John.
 M. 369. Liddle, Thos.
 M. 278. Lilly, Thos.
 M. 99. Linklater, Andrew.
 M. 519. Linn, Edwin.
 M. 583. Little, Geo.
 M. 596. Liversed, Fras.
 M. 585. Lott, E. J.
 M. 332. Love, Luke.
 M. 113. Lowden, Fletcher.
 P. 318. Lowry, Thos.
 P. 67. Lowsye, John.
 M. 708. Luckock, Wm.
 M. 539. Lyall, John.
- M.
- M. 454. Mace, Fred. Wm.
 P. 15. Main, John.
 M. 461. Main, Wm.
 M. 477. Mann, James.
 M. 155. Mantle, George.
 M. 793. Martin, Luke.
 M. 470. Martyn, W. H.
 M. 623. Martyn, J. A.
 RN. 656. Martyn, Wm.
 M. 746. Marshall, Peter.
 SM. 788. Mather, Jas.
 M. 127. Matthews, G. Walton.
 P. 34. Matthews, James.
 M. 513. Matthews, T. R.
 RN. 703. Maunders, Edward.
 M. 343. Machell, Rd. S.
 P. 23. Mackereil, S. R. J.
 M. 513. Mackie, John Duff.
 M. 402. Mackie, Alex.
 FM. 780. MacLean, Geo. M.
 LA. 754. MacLoon, E. C.
 M. 589. McArthur, Wm. F.
 P. 85. McCarthy, Denis.
 RN. 707. McDonald, John.
 M. 241. McEwen, John.
 M. 775. McEechie, David.
 M. 373. McEwan, Wm.
 M. 253. McKirdy, John.
 M. 187. McKnaught, Rout.
 M. 405. McLaren, Walter.
 FM. 466. McNair, Jas.
 M. 397. McNeily, Geo.
 M. 455. McPherson, Hugh.
 M. 373. Meik, Thos.
 FM. 756. Melcher, Geo. M.
 M. 314. Menarry, Wm.
 M. 236. Menzies, David.
 M. 681. Metcalf, John.
 M. 115. Metcalf, Geo.
- M. 148. Miller, John.
 RN. 588. Millar, W. F.
 M. 496. Milliken, C. W.
 M. 354. Milligan, John.
 RN. 695. Mills, Wm.
 M. 261. Milman, Wm.
 M. 266. Mill, Chas.
 M. 243. Milne, Andrew.
 M. 285. Monro, Andrew.
 M. 342. Montgomerie, Robt.
 M. 650. Moodie, Edwin R.
 P. 102. Moore, Wm. Coats.
 M. 404. Moore, Wm. H.
 M. 488. Morell, Robt.
 M. 781. Morgan, E. E.
 FM. 171. Morquies, Capt.
 M. 152. Moss, Herbert.
 M. 326. Mortleman, Wm.
 M. 209. Morton, George.
 P. 244. Mowle, Thos. Balphs.
 P. 14. Mowll, Richd.
 M. 147. Muir, Thos.
 M. 766. Munro, D. G.
 M. 338. Murphy, Edward.
- N.
- P. 741. Needham, John.
 M. 196. Neill, Alex.
 P. 30. Neuron, Robt.
 P. 222. Newby, Isaac.
 P. 128. Newton, Jas.
 M. 593. Noble, Capt. A.
 P. 23. Nohr, Thos.
 M. 762. Noire, W. J.
 FM. 422. Norton, R.
 P. 87. Newman, Robt.
- O.
- M. 328. Oldman, Robt.
 M. 359. Orange, G.
 M. 538. Oriscarr, John.
 FM. 151. Orpen, Louis.
 M. 245. Owens, Peter.
 M. 434. O'Brien, W. C.
 M. 294. Ogilvie, John.
 M. 518. Outerbridge, Wm.
- P.
- M. 510. Page, Geo.
 P. 17. Pain, John.
 M. 471. Palfrey, Richd.
 P. 42. Palmer, Geo.
 P. 779. Palmer, Wm.
 FM. 464. Panitzsch, Rudolph.
 P. 106. Parfett, Wm.
 M. 363. Parker, Chas.
 P. 783. Parry, Richd.
 P. 765. Parry, Thos.
 P. 57. Payne, Wm.
 RN. 331. Pearce, Geo.
 RN. 598. Pearn, E. J. P.
 P. 219. Pearson, H.
 M. 478. Penfit, Wm.
 M. 674. Penn, James.
 M. 490. Pentecost, Rd.
 P. 53. Pentreath, Thos.
 M. 84. Perkins, Daniel.
 P. 52. Perriam, J. W.
 P. 57. Perriam, R. L.
 FM. 755. Perry, Eli.
 M. 502. Perry, Thos.
 RN. 600. Petch, Wm. H.
 FM. 644. Petrie, P. E.
 FM. 157. Petrowski, T.
 P. 58. Pezzark, Rd.
 M. 48. Pickhall, John.
 M. 212. Pike, Robt.
 P. 22. Phillips, Robt.
 M. 748. Phillips, Robt.
 M. 638. Phillips, Wm.
 M. 460. Price, John.
 M. 394. Power, John.
 M. 270. Pookey, John R.
 M. 728. Poole, Jas.
 RN. 667. Pope, Chas.
 P. 1. Popkiss, Wm.
 RN. 690. Potter, Thos.
 M. 649. Powell, Chas.
 P. 618. Powell, Joseph.
 M. 530. Power, John.
 M. 519. Prowditch, Thos.
 RN. 685. Pullery, T. C.
- Q.
- M. 316. Quance, Rd.
 M. 407. Quine, Wm.
- R.
- M. 446. Radford, Saml.
 P. 134. Ralph, Thos.
- M. 291. Randall, Wm.
 M. 457. Randall, Wm.
 RN. 680. Raneys, H. E.
 M. 561. Rankin, John.
 FM. 189. Rasch, C. Alf.
 M. 51. Rattray, Jas.
 P. 96. Ray, Hen., sen.
 RN. 696. Raymond, Geo.
 M. 553. Rayner, Geo.
 M. 141. Raynes, H. C.
 RN. 670. Read, F. S.
 M. 573. Redmore, Richd.
 M. 573. Rees, Arthur, J.
 M. 286. Reid, John.
 P. 740. Reid, David.
 M. 375. Reynolds, Nich.
 M. 719. Reynolds, Thos.
 P. 33. Richards, Geo.
 RN. 733. Richards, Geo.
 M. 83. Richardson, Wm.
 MS. 730. Ridley, John H.
 M. 349. Roberts, Richd.
 M. 717. Roberts, Robt.
 M. 652. Roberts, W. H.
 M. 193. Robertson, Alex.
 M. 311. Robinson, John.
 M. 271. Robinson, Richd.
 M. 177. Robinson, Thos.
 M. 341. Rodd, Wm.
 M. 262. Roder, Alex.
 M. 646. Roldland, Chas.
 M. 495. Ross, Hugh.
 M. 560. Roskell, W.
 FM. 549. Rowlands, Thos.
 RN. 637. Rowth, Edwin.
 M. 325. Rowe, W. P.
 RN. 591. Roweth, Josh.
 P. 614. Rowlands, Wm.
 SA. 231. Rowland, John.
 P. 46. Rouse, Royal.
 M. 620. Runnoldson.
 P. 21. Rust, Wm.
 M. 345. Ryan, John.
- S.
- M. 107. Sadler, Thos.
 M. 255. St. Patrick, Philip H.
 P. 25. Salmon, Jas.
 P. 28. Salmon, John.
 P. 221. Samson, Joseph.
 M. 166. Samuel, Robt. B.
 FM. 424. Sawyer, Moses H.
 M. 645. Sawyer, Thos. W.
 S.O. 532. Shankland, Robt.
 M. 121. Small, Andw.
 P. 80. Small, John.
 M. 582. Small, Thos.
 M. 368. Spray, P. B.
 M. 371. Spray, Wm.
 M. 569. Stacy, John.
 P. 79. Stanford, Joseph.
 M. 76. Stanns, Geo.
 RN. 758. Stanton, Wm.
 M. 517. Star, Leonard G.
 M. 365. Stavely, Robt.
 M. 372. Straneck, H.
 P. 55. Sebern, Jas.
 M. 72. Seeds, Hugh.
 M. 175. Sergent, John.
 FM. 176. Shepke, G.
 SB. 210. Shea, John.
 A.P. 631. Sheguthen, Hugh.
 M. 856. Shelford, Jas.
 M. 559. Shephard, Richd.
 M. 581. Skelly, John.
 P. 48. Spence, Wm. Alex.
 P. 566. Spencer, Thos.
 M. 415. Steele, J. W.
 M. 209. Stephen, Jas.
 M. 230. Steward, Jas. Dick.
 M. 501. Stewart, Wm.
 M. 603. Stevens, Benj.
 M. 274. Stevens, Wm.
 M. 354. Stevenson, Archd.
 Tyne I.C. 757. Stevenson, J. C.
 M. 536. Stevenson, W. P.
 RN. 11. Sidney, Fred, W.
 M. 207. Silbowie, S.
 M. 184. Sim, Wm. Fletcher.
 M. 439. Simmin, John.
 M. 264. Simms, R. J.
 P. 647. Simpson, Fredk.
 M. 331. Simpson, G. (Capt.)
 P. 624. Simpson, Wm. B.
 P. 624. Simpson, Wm. B.
 M. 81. Sinclair, Alex.
 M. 280. Schier, Chas.
 P. 123. Skilton, H.
 M. 521. Smith, Fras.
 M. 432. Smith, Jas.
 M. 292. Smith, John.
 RN. 667. Smith, John S.
 SB. 238. Smith, Peter.
 M. 747. Smith, Walter.
 M. 594. Smith, Wm.
 M. 642. Smithett, Luke.
- P. 122. Spius, John.
 M. 450. Sopwith, Thos.
 M. 387. Soulsby, H.
 M. 406. Scott, Jas. R.
 M. 177. Scott, T. J.
 FM. 458. Schlor, C. J.
 FM. 550. Snock, J.
 M. 587. Stone, Jas.
 M. 430. Stone, Wm.
 M. 378. Shugg, Thos.
 RN. 692. Stuart, B. B.
 P. 403. Svidal, Daniel.
 M. 306. Symes, Jacob.
- T.
- P. 607. Taggirt, Robert
 Y. 641. Talbot, C. R. M.
 M. 104. Talbot, Wm.
 FM. 447. Tanner.
 RN. 792. Taylor, Geo.
 M. 211. Taylor, James.
 M. 716. Taylor, John.
 RN. 671. Taylor, Joshua.
 M. 116. Taylor, Saml.
 P. 349. Taylor, Thos.
 M. 335. Tregarthen, Jas.
 M. 469. Tregoning, S.
 M. 218. Tiley, J. C.
 M. 556. Tier, Jas.
 M. 715. Triphook, Richd. S.
 RN. 572. Thomas, F. W. L.
 Y. 641. Thomas, Geo. Barton.
 P. 109. Thompson, Geo. Jas.
 RN. 613. Thompson, John.
 SO. 256. Thompson, John R.
 M. 479. Tointon, Willm.
 P. 142. Tonkin, H.
 RN. 768. Tonkin, Jas.
 M. 514. Toother, Wm. Law
 P. 369. Toyt, John.
 FM. 427. Truman, Dan. H.
 RN. 694. Tucker, J.
 M. 101. Tulloch, Jas.
 RN. 724. Tully, John.
 P. 65. Tupman, John.
 M. 491. Turner, Jas.
 M. 136. Turner, John.
- V.
- RN. 676. Vane, H.
 M. 206. Vaggars, Capt.
 FM. 185. Vansdow, J.
 P. 368. Vincent, Richs.
 P. 529. Vincent, Wm.
 V.O. 570. Vincent, Wm.
 514. Vivian, John.
- W.
- M. 564. Wade, Wm. John.
 M. 340. Waite, Joseph.
 M. 531. Wake, Wm.
 M. 392. Wakeley, Geo. H.
 M. 576. Walker, Chas.
 M. 304. Walker, H.
 Y. 761. Walker, John.
 M. 575. Walker, Wm.
 RN. 651. Waller, John.
 P. 90. Wallis, John.
 M. 443. Wallis, J. S.
 Y. 726. Walsh, Sir John.
 M. 314. Warren, Matthew
 M. 751. Warren, Wm. H.
 M. 307. Waser, Geo.
 M. 555. Waters, Ralph.
 P. 77. Waters, Wm.
 P. 38. Watkins, Wm.
 M. 541. Watson Leonard.
 M. 377. Watson, Leonard.
 M. 482. Watts, Wm.
 M. 388. Wharton, John.
 SO. 337. Weir, Wm.
 RN. 698. Webb, John J. C.
 RN. 39. Webb, Wm.
 M. 322. Weeks, Saml. M.
 M. 435. Welch, Alfred.
 SA. 62. Welch, Chas. G.
 M. 770. Weller, Chas. G.
 M. 324. Wells, W. B.
 M. 606. Wells, Edward.
 RN. 9. Williams, George.
 M. 150. Williams, Geo. Thos.
 M. 284. Williams, H.
 M. 610. Williams, Isaac.
 P. 608. Williams, John.
 M. 622. Williams, John.
 RN. 710. Williams, John.
 M. 712. Williams, Richd.
 M. 722. Williams, Richd.
 P. 617. Williams, Robt.
 M. 487. Williams, Thos.
 M. 713. Williams, William.
 P. 612. Wilson, Jas.

M. 550. Wilson, John.
 P. 778. Wilson, John.
 M. 511. Wilson, William.
 M. 111. Wise, Robt.
 M. 214. Wishart, William.
 M. 199. White, Archd.
 M. 636. White, Jas. Thos.
 M. 527. White, John.

M. 414. White, William.
 P. 71. Whitley, John.
 M. 546. Wright, Francis.
 M. 362. Wright, William.
 M. 456. Wood, Joseph.
 P. 615. Woodward, Hugh.
 M. 648. Woolcott.
 RN. 722. Woolley, F.

FM. 410. Woolsgoord, Fraoli
 Peterson.
 RN. 687. Wunder, F.R.
 Y.
 M. 421. York, C. C.

NAMES OMITTED.

M. 183. 90, Newby St., Walton
 Lane, Liverpool.
 M. 423. A Master in the
 Foreign Trade.
 P. 729. A Pilot from Shields
 to the Downs.

LIST OF WITNESSES.

In order to find the Evidence of a Witness look under each Question for his number in this List. The letters in the margin indicate the profession of the witness; see ABBSTRACT, p. 588, for the number of witnesses of each Profession indicated by the letters below, and for the meaning of each letter, as P. Pilot.

REPLY TO QUESTIONS

35. Be so good as to sign your name, stating your present occupation, and giving an address.

36. Date and fold the paper, and send it (unpaid) to the nearest Post Office.

33. If you have served at sea, state for how long.

34. If you command a vessel, give her name and tonnage, and port of register; and if a steamer, her horse power.

1. Are you well acquainted with any particular parts of the Coast of the United Kingdom?—If so, name them.

2. Are you well acquainted with any Foreign Coasts?—If so, name them, or those parts of them with which you are well acquainted.

1. WILLIAM POPKISS.—Trinity Cinque Ports Pilot, 2, Victoria Crescent, Dover.—April 28th, 1859.—I have served at sea ever since 1821.—1. From the Owers to Gravesend. P.
2. JOHN DAVISON.—Pilot.—26, Bromley Street, Commercial Road East, London.—April 29th, 1859.—Have served at sea 16 years, and as pilot 19 years.—1. From London Bridge to the Downs, and North Channel to Orford Ness. P.
3. WERTER CLARK.—Trinity Cinque Ports Pilot, Dover.—April 27th, 1859.—Upwards of 50 years.—1. The coasts of Kent, Sussex, Hampshire, and Dorset.—2. The French coast, from Boulogne to Calais; and coast of Flanders, from Calais to the East Scheldt; and the coast of Holland, to the Texel. P.
4. GEORGE BRAMSTON.—Channel Pilot, 17, Pigott Street, East India Road, E.—April 28th, 1859.—From 15 to 25.—1. Yes, from London Bridge to the Land's End of England, more particularly than any other part.—2. The coast of France, from Calais, Bay of Biscay, coast of Portugal, Gut of Gibraltar, and Mediterranean. P.
5. J. W. ARNOLD.—Trinity Cinque Ports Pilot, 9, Park Street, Deal.—April 25th, 1859.—I have served at sea 20 years, that is to say, ever since I was 10 years old, and the whole of that time along the eastern coasts of England.—1. Yes, from the Isle of Wight to the Firth of Forth, N.E. coasts of England.—2. Yes, from Boulogne to Flushing. P.
6. RICHARD IRON.—Trinity Cinque Ports Pilot, Dover.—April 27th, 1859.—Since 1833.—1. From the west end of the Owers to Gravesend. P.
7. EDWARD KILK. CALVERS.—Master, R.N., and Admiralty Surveyor; permanent address, Sunderland.—Since the year 1828, continuously.—The "Seaflower," a cutter of 116 tons, at my command, as Surveyor of the east coast of England.—1. During an experience of 25 years have become well acquainted with Shetland and Orkneys, east coast of Scotland, and east and west coasts of England.—2. A youngster's acquaintance only with the East Indian and South American coasts; but of late years have frequently been on the coast extending from the Elbe to Cape Grisey. R.N.
8. ADOLPHUS GEORGE EDEY.—A Commander in the Royal Navy, Valentia, county Kerry, Ireland.—H.M.S. "Shamrock," Harroaze, April 26th, 1859.—30 years, 29 on active service.—Command of the Kerry Survey, S.W. coast of Ireland, H.M. surveying vessel "Shamrock," 60 H.P.—1. Am well acquainted with the Irish (St. George's) Channel, and the western coast of Ireland, from Sligo to Valentia. R.N.
9. GEORGE WILLIAMS.—Captain, R.N., in charge of Admiralty Survey, coast of Cornwall.—April 23d, 1859.—37 years.—1. Coast of Cornwall. R.N.
10. GEORGE M. ALLDRIDGE.—Commander, R.N., H.M.S. "Asp," Devonport, Admiralty Surveyor.—April 18th, 1859.—Served constantly for 30 years in surveying vessels, and 10 years in charge of surveys.—In command of H.M.S. "Asp" (in charge of surveys), 112 tons, 50 horse power.—1. Yes; thoroughly acquainted with the Irish Sea and the coast on either side, including the harbours, ports, and anchorages; as also of the Isle of Man, Liverpool, and River Dee. Likewise thoroughly acquainted with the Bristol Channel, its harbours, ports, and anchorages, and dangers.—2. Yes, with the Grecian Archipelago, the Morea, coasts of Thessaly, Roumelia, and Asia Minor, islands of Rhodes, Candia, and Malta. R.N.
11. FREDERICK W. SIDNEY.—Commander, R.N., Admiralty Survey, Guernsey.—Surveying service 25 years.—1. Alderney.—2. River Plate; the channels from Colonia and Buenos Ayres to the entrances of the Rivers Parana and Uruguay. R.N.
12. HENRY L. COX.—Commander and Surveyor, R.N., in charge of South Coast of England Survey, 51, Emma Place, Stonehouse, Devon.—35 years.—1. From Portsmouth to Plymouth.—2. A general acquaintance with several foreign stations. R.N.
13. GEORGE AUGUSTUS BEDFORD.—Captain, R.N. Admiralty Surveyor, Rathmullan, county Donegal.—April 25th, 1859.—About 35 years, principally as Admiralty Surveyor.—1. The west and north-west coast of Ireland, from the mouth of the Shannon to Lough Foyle, the whole of which I have surveyed for the Admiralty.—2. Not in connexion with the present inquiry. R.N.
14. RICHARD MÖWLL.—Pilot, 42, Snargate Street, Dover, Kent.—56 years.—I am a Cinque Port pilot, and have been so, and in the Navy, 50 years.—1. From the Isle of Wight to London Bridge, and from London Bridge to Lowestoff.—2. From Cape Grizne, in France, to the Texel Island, in Holland. P.
15. JOHN MAIN.—Pilot, 43, East Street, Portsmouth; is about to give up through ill health.—40 years.—No.—1. From the Owers to Peverley Point, and any place inside of the Isle of Wight. P.
16. FREDERICK HIGGINSON.—In the command of the "Foyle" steamer, 18, Burlington Road, Dublin.—April 29th.—36 years, the last 23 years in the coasting trade.—Command the "Foyle," 443 tons register, 400 horse power, Dublin.—1. Well acquainted with the coast from Dublin to London.—2. Pretty well, with the Baltic and Mediterranean. M.
17. JOHN PAIN.—Cinque Port Pilot, 32, Lower Street, Deal, Kent.—All my life.—1. Yes, from St. Catharine Point to Orfordness.—2. Yes, from Cherbourg to Texel. P.
18. GEORGE KIDD.—Craigie Terrace, Dundee.—April 29th, 1859.—From 1810 to 1834, and have been as Shipowner since.—During my command at sea, I had two vessels in the Baltic trade, and without accident during all that time.—1. I was in command from 1816 until 1834, Baltic only.—2. In the Baltic. M.
19. ROBERT HURST.—Pilot, No. 2, Cannel Walk, Southampton.—April 29th, 1859.—From 1813 to 1848.—Trinity Pilot from 1848.—1. From Downs to Land's End.—2. From Gaskets to Calles. P.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- P. 20. ABEL KING.—Pilot, Waterside, Gorleston, Suffolk.—Age 52. Always employed at sea; 27 years a pilot.—I have no command of any vessel only those I pilot.—1. The coast of Norfolk and Suffolk.—2. None.
- P. 21. WILLIAM RUST.—Trinity Pilot, Lowestoft, Suffolk.—April 29th, 1859, Lowestoft.—18 years.—1. North Sea and north-east coast.—2. Some parts of the Baltic and Gulf of Finland.
- P. 22. ROBERT PHILLIPS.—Pilot.—Milford Haven, May 1st, 1859.—30 years.—“Romulus,” Pilot Cutter, No. 5.—1. Milford Haven and district.
- P. 23. SAMUEL R. J. MACKEREL.—Pilot, Gorleston, Suffolk.—35 years.—None.—1. Norfolk and Suffolk.
- P. 24. THOMAS LEGGETT.—Trinity Pilot, Gorleston, Suffolk.—Gorleston, May 2d, 1859.—25 years.—1. East coast from Humber to the South Foreland.—2. None in particular.
- P. 25. JAMES SALMON.—Pilot, Gorleston, Suffolk.—May 2d, 1859.—20 years.—None.—1. Norfolk and Suffolk.
- P. 26. THOMAS LAYTON.—Trinity Pilot, No. 7, Providence Place, Great Yarmouth, Norfolk.—May 2d, 1859.—1 have served at sea 48 years.—1 command no vessel, except by piloting them from the Well Bank, &c. to Gravesend and the Downs.—1. I am well acquainted with the east coast from Flamborough Head to Orfordness and Harwich Harbour, and to Gravesend, and across the Kent to the Downs.—2. I am only partially acquainted from Heligoland to Cherbourg in France.
- P. 27. HENRY LEGGETT.—Pilot, Gorleston, Suffolk.—May 2d, 1859.—45 years.—None.—1. Norfolk and Suffolk.
- P. 28. JOHN SALMON.—Pilot, Gorleston, Suffolk.—May 2d, 1859.—36 years.—None.—1. Norfolk and Suffolk.
- P. 29. CHAS. LEGGETT KING.—Pilot, Gorleston, Suffolk.—Been a pilot 14 years; 32 years at sea in all.—I have commanded only vessels that I have piloted.—1. The coast of Norfolk and Suffolk.
- P. 30. ROBERT NEURON.—Pilot, Gorleston, Suffolk.—I have been a pilot 27 years, and at sea in all 49 years.—I have not commanded any vessel but those I had charge of as pilot.—1. The coast of Norfolk and Suffolk.
- P. 31. D. M. GOLDSACK.—Trinity Pilot, 6, Princes Street, Deal Kent.—From 1838 up to present date, 1859.—1. Yes, from Isle of Wight to Tynemouth.—2. Yes, from Boulogne to Flushing.
- P. 32. J. S. GIBSON.—Trinity Pilot, Aldbro', Suffolk.—May 2d, 1859.—44 years.—Commanded a vessel previous to being a pilot, which occupation I now hold.—1. From the Firth of Forth to the Land's End.—2. From the Texel, Holland, to Havre, France.
- P. 33. GEORGE RICHARDS.—Channel Pilot, Semaphore Place, Portsmouth.—32 years.—Master and owner of the Pilot Cutter, “Marquis of Anglesey,” of Portsmouth.—1. The whole of the coast of England, east coast of Scotland, and from Cape Clear to Belfast, in Ireland.—2. With the North Sea, and the coast from Brest to Heligoland.
- P. 34. JAMES MATTHEWS.—Pilot, Sea View, Isle of Wight, Ryde.—April 2d, 1859.—49 years at sea; 41 years a licensed Trinity Pilot for the ports at Cowes to Portsmouth.—“Daring,” 34 tons, Pilot Cutter, registered at Cowes.—1. English Channel, on the coast of England, more particularly in my districts as a pilot, that is, from the Owers eastward, to the Start westward, into and out of the ports of Cowes and Portsmouth.—2. Not acquainted with foreign coasts.
- P. 35. THOMAS JONES.—Pilot, 24 years in British Channel (from London) 2, Hardwicke Place, Commercial Road East.—May 2d, 1859.—1. Trinity House Pilot from London to the Isle of Wight.—2. No.
- P. 36. STEPHEN N. LARKINS.—Cinque Port Pilot, Sir Linekin Street, Dover, Kent.—About 47 years.—1. To the extent of my licence.—2. From Boulogne, eastward of Ostend; not so much from Ostend to the Texel, having no practice to that extent.
- P. 37. JOHN JONES.—Pilot, 9, Britain Street, Portsea.—43 years pilot in the English Channel only.—Buoy Boat Dockyard Vessel, Portsmouth, 67 tons.—1. English Channel.—2. None.
- P. 38. WILLIAM WATKINS.—Licensed Pilot, Milford Haven.—29 years.—1. Coast of Ireland and Bristol Channel.—2. Valparaiso, Calao, and along the coast.
- M. 39. WILLIAM WEBB.—Master of the “Leda,” Yarmouth, Isle of Wight.—25 years.—R. Y. S. Schooner Yacht “Leda,” 137 tons, port of Cowes.—1. Yes, the south coast of England.—2. Yes, Mediterranean, Archipelago, coasts of Spain and Portugal.
- P. 40. WILLIAM CABLE.—Trinity Pilot, Aldbro', Suffolk.—36 years.—1. Well acquainted from Lowestoft to Gravesend.—2. Being a licensed pilot for 19 years I am not acquainted with any foreign coasts.
- M. 41. THOMAS EWING.—10, Shore Terrace, Dundee.—48 years.—The last vessel I commanded was the “London,” steam ship, 686 tons, 300 horse power, registered at Dundee.—1. With all the coast from the Thames to the Tay.—2. No.
- P. 42. GEORGE PALMER.—Cinque Ports Trinity Pilot, 16, Beach Street, Deal.—May 3d, 1859.—30 years.—Only as a pilot.—1. From the west end of Owers to Gravesend, and the coasts of Flanders and Holland.—2. Flanders and Holland.
- P. 43. HENRY GILL.—Pilot, “Gnome,” Yacht, 4, Grafton Street, Landort, Hunts.—May 4th, 1859.—40 years principally at sea.—“Mischief,” 221 tons, O.M. Schooner, Portsmouth.—1. Portland, Dartmouth, Plymouth, Falmouth, Milford, Cork, King's Town, Belfast, Greenock, Channel Islands, Downs, Nore, and Sheerness.—2. Dieppe, Genoa, Tunis, Tripoli, &c.
- P. 44. WILLIAM F. ATKINSON.—2, Laura Terrace, Campbell Road, Bow, E.—8 to 9 years.—Pilot for the last 24 years.—1. London to Isle of Wight.—2. Not any.
- P. 45. PHILIP FRANCIS GREEN.—Trinity Pilot, Aldeburgh, Suffolk.—20 years.—Piloted several steam ships from 100 to 600 horse power.—1. Leith Roads to Land's End.—2. Heligoland to Cape La Hague.
- P. 46. ROYAL ROUSE.—Pilot, Gorleston, Suffolk.—Gorleston, May 2d, 1859.—38 years.—1. East coast from Humber to the South Foreland.—2. None in particular.
- P. 47. GEORGE BUTCHENT.—Pilot, 55, Bromley Street, Stepney.—32 years.—7 years commanded a vessel, and have now been 13 years a licensed Trinity Pilot.—1. Between London Bridge and Orfordness to the Downs on to the Isle of Wight, and the east coast of England.—2. The coast of Norway and the Baltic.
- P. 48. WILLIAM ALEXANDER SPENCE.—Trinity House Pilot, 17, Smith Street, Jubilee Street, Commercial Road East, London.—May 3d, 1859.—28 years altogether.—1. From London to the Isle of Wight, and vice versa.—2. None in particular.
- P. 49. CHARLES KING.—Pilot, Gorleston, near Great Yarmouth, Norfolk.—Gorleston, May 2d, 1859.—45 years.—1. East coast from Cromer to Orfordness.—2. None in particular.
- P. 50. WILLIAM HAYWARD.—Trinity Cinque Ports Pilot.—Dover, May 4th, 1859.—I have served at sea since 1822.—1. From the west end of the Owers to Gravesend.—2. I have had no practice on foreign coasts these last 20 years.
- M. 51. JAMES RATTRAY.—Master Mariner, 46, James's Park, Dundee.—30.—Steam Ship “Dundee,” of Dundee, 378 tons register, 300 horse power.—1. East coast of England and Scotland.—2. No one in particular.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

52. J. W. PERRIAM.—Trinity Pilot, Parker's Lane, Exmouth.—May 5th, 1859.—I served an apprenticeship as pilot, and have continued in that service 25 years.—I command the "King George," Pilot Cutter, of Exeter, 25 years.—1. I am well acquainted with that part of the coast which lies between the Start Point and the Bill of Portland.—2. No. P.
53. THOMAS PENTREATH.—Pilot, Mousehole, Port of Penzance.—May 2d, 1859.—20 years piloting with my father, who was pilot in Mounts Bay for 25 years.—"John Wesley," Pilot Boat, Penzance.—1. West coast of England.—2. No. P.
54. J. F. KRUGER.—Master Mariner, 17, Storey Street, Hull.—May 3d, 1859.—Upwards of 30 years.—"Lion," 1,073 tons, Hull, 360 horse power.—1. The east coast, English, and St. George's Channel to Liverpool.—2. The coasts of Norway, Cattegat, and Baltic Seas, up to St. Petersburg; the coasts of Holland to the entrance of the Elbe, the Mediterranean and Black Seas; the coasts of the United States, and British North America. M.
55. JAMES SEBERN.—Pilot, St. Mary, Extra Woolstor, Harf.—For 45 years at sea, and piloting in the Southampton district.—I have never been commander, but have piloted hundreds of vessels.—1. Yes, the Solent and Spithead passages, and Southampton rivers.—2. I am acquainted with no foreign coasts. P.
56. JAMES BOWYER.—Pilot, 17, Paget Street, Southampton.—From 1825 to 1845, since then piloting.—1. From the Downs to Plymouth and Southampton Water. P.
57. R. L. PERRIAM.—Trinity Pilot, Tower Street, Exmouth.—April 30th, 1859.—Served an apprenticeship as pilot, and have continued in that service 26 years.—I command the "Jane," 26 tons, registered at Exeter, and formerly a pilot cutter of that port.—1. I am well acquainted with that part of the coast which lies between the Start Point and the Bill of Portland.—2. No. P.
58. RICHARD PEZZARK.—Pilot, Mousehole, Port of Penzance.—May 2d, 1859.—55 years at sea, served as a pilot for boats, and 39 years a licensed pilot.—First the Pilot Boat "Resolution," 35 years and upwards, since, the Pilot Boat "Witherall," for 15 years.—1. West coast of England.—2. No. P.
59. THOMAS DAWSON.—Master of the "Hawk," S.S. Hull, 9, Waverley Street, Hull.—Hull, May 6th, 1859.—38 years.—"Hawk," Screw Steamer, 260 tons register, of Hull, 100 horse power.—1. Yes, from the Firth of Forth to the entrance of the Thames mouth.—2. Yes, the coast of Holland, Zuteland, Norway, Sweden, Denmark and Baltic Sea generally. M.
60. JAMES S. CALVER.—Pilot, Gorleston, Suffolk.—May 4th, 1859.—38 years.—None.—1. Norfolk and Suffolk. P.
61. WILLIAM DAWSON.—Shipowner, 6, Villiers Street, Sunderland.—May 4th, 1859. Any further information I can give I shall be happy to give it, if thought worth anything.—20 years, out of which 13 years captain, 5 years mate, being in that capacity before my apprenticeship was done.—Not at present, having left the sea about 5 years since.—1. East coast principally.—2. Cattegat, Sound and Grounds, Baltic, Gulf of Finland, (these embrace coasts of Norway, Sweden, Denmark and Russia), also some parts of France. M.
62. GEORGE WELCH.—Ship Agent, &c., Dundee.—May 4th, 1859.—23 years.—I have not been to sea (except as a passenger) since December 1849.—1. I have such knowledge of the east and south coasts of the United Kingdom as I acquired during 23 years in the foreign trade from the United Kingdom (15 years as master).—2. Cattegat, East Sea, and Gulf of Finland. P.
63. J. A. GODDEN.—Trinity Cinque Port Pilot, Dover.—Dover, May 4th, 1859.—I have served at sea since 1831.—1. From the Overs to Gravesend. P.
64. WILLIAM FULLER.—Trinity Cinque Port Pilot, Bulwark Hill, Dover.—Dover, May 5th, 1859.—41 years.—1. From the Overs to Gravesend.—2. From the long time I have been absent from them, I do not consider myself competent to give an opinion. P.
65. JOHN TUPMAN.—Trinity Pilot, 48, Bicton Street, Exmouth.—April 30th, 1859.—Served an apprenticeship as pilot, and have continued in that service 46 years.—I now command the "Lady Rolle," Pilot Cutter, 15 tons, registered at Exeter.—1. I am perfectly acquainted with the coast lying between the Start Point and the Bill of Portland.—2. No. P.
66. WILLIAM RICHARDSON.—Trinity Pilot, Aldbro', Suffolk.—May 4th, 1859.—34 years.—1. Well acquainted from Lowestoft to Gravesend.—2. Being a licensed pilot for 13 years I am not acquainted with any foreign coast. P.
67. JOHN LOWSEY.—North Sea Trinity Pilot for 30 years, Southwold, Suffolk.—I have been at sea 50 years.—1. East coast of England from the Lemon to Gravesend. P.
68. WILLIAM GIRLING.—Trinity Pilot, Southwold, Suffolk.—May 3d, 1859.—23 years.—Trinity Pilot.—1. With the English Channel, but more particular with the north-east coast.—2. None in particular. P.
69. WILLIAM SIMPSON.—North Channel Trinity Pilot for the last 9 years, Southwold, Suffolk.—I have served at sea 28 years.—I was in charge of a small vessel called the "Charles," of Southwold, 70 tons, for 9 years.—1. North coasts of England, east coasts, English Channel, and St. George's Channel.—2. The coasts of Holland, Belgium, France, &c. P.
70. EDWARD CLODD.—Trinity Pilot, Aldbro', Suffolk.—37 years.—1. Well acquainted from Lowestoft to Gravesend.—2. Being a licensed pilot for 19 years, I am not acquainted with any foreign coasts. P.
71. JOHN WHILEY.—Pilot, Gorleston, Suffolk.—May 4th, 1859.—42 years.—Never any.—1. Norfolk and Suffolk. P.
72. HUGH SEEDS.—Overlooker for Messrs. John Martin and Son, Dublin, residing at 30, Lower Gloucester Street, Dublin.—33 years.—Not in command last 4 years.—1. I am well acquainted with coast of Ireland from Tuskar to Dublin.—2. Yes, tolerably well with east coast of America from River Plato to Gulf of St. Lawrence. M.
73. THOMAS NOBLE.—Pilot, No. 26, New Street, Plymouth.—May 5th, 1859.—5 years at sea, 14 years a pilot.—1. From the Land's End to the Downs.—2. Nova Scotia and Prince Edward's Island, Cherbourg, and the islands of Guernsey, Jersey, and Alderney, and inside them. P.
74. JOHN DASH.—Pilot, St. Mawes.—Yes, six years.—1. From the Land's End to the Ram's Head.—2. No. P.
75. BENJAMIN PARKER BEAUMONT.—Master Mariner, 34, Lister Street, Hull.—25 years.—"Tiger," Steamer, 442 tons register, 150 horse power.—East and west coast of England, from the Nore to Shetland, and from Liverpool to Cape Clear.—2. Baltic, Hamburg, Antwerp, coast of Norway in the Sleev, from Point de Galle to the Head of the Persian Gulph in the East Indies. M.
76. GEORGE STANNS.—Master, "Marco Bozzaris," Steamer, 15, Great Hermitage Street, Wapping.—For 20 years.—The "Black Prince," Steamer, 400 tons, of London, and of 70 horse power.—1. From the Land's End down to Berwick, south coast.—2. The French, Spanish, and Portuguese coasts, and also the Mediterranean. M.
77. WILLIAM WATERS.—First-class Trinity Pilot, 9, Bugle Terrace, Southampton.—30 years.—1. The English Channel. P.
78. JAMES COOK.—Trinity Pilot, 25, Penny Street, Portsmouth.—May 7th, 1859.—49 years.—1. The British Channel, from the Downs to Plymouth, including the channels and ports inside the Isle of Wight.—2. No. P.
79. JOSEPH STANFORD.—Trinity Pilot, Southtown, Yarmouth, Norfolk.—26 years.—1. East coast from Humber to the South Foreland, Lynn Deep excepted.—2. None in particular. P.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- P. 80. JOHN SMALL.—Trinity Pilot, 9, Avenue Road, Bow, E.—May 9th, 1859.—48 years.—Several, previous to entering the pilot service.—1. From Orfordness to the Land's End.—2. From Calais to the Hook of Holland, part of the coast of France, Belgium, and Holland.
- M. 81. ALEXANDER SINCLAIR.—Master Mariner, 12, Carlisle Terrace, Bow, E.—23 years.—“Salamanca,” 981 tons, London.—1. A tolerable acquaintance with the English Channel.—2. Coasts of India.
- P. 82. THOMAS HARVEY.—Pilot, Wood Street, Ryde, Isle of Wight.—Ryde, May 9th, 1859.—Pilot 41 years.—Nil.—1. From Start Point to Beachy Head.—2. None.
- M. 83. RICHARD REDMORE.—Master of Schooner “Margaret,” 14, Orchard Street, Bristol.—I have been to sea 29 years.—Schooner “Margaret,” of Bristol, 93 tons.—1. I am acquainted with the English Channel, and also the Bristol and St. George's Channel; Portland Lights, Starts Lights, and Lizard are the most powerful, I have always found them such.—2. The coast of France to the Mediterranean Sea is the best lighted of any foreign coast there.
- M. 84. DANIEL PERKINS.—Britonferry, near Neath, Glamorganshire, S.W.—May 7th, 1859.—28 years.—Steam Tug “Pioneer,” 46 horse power.—1. Yes, St. George's, Bristol, and English Channels to Plymouth.—2. 1 am not.
- P. 85. DENIS MCCARTHY.—Trinity Pilot, Britonferry, Neath, South Wales.—19 years and 6 months.—The “Eliza,” of Swansea, 55 tons, and the “Mary Ann,” of Jersey, 60 tons.—1. The three channels from the Downs to Liverpool and the south-west coast of Ireland.—2. Brest on the coast of France and the ports near it, and the lower part of the Mediterranean.
- P. 86. DANIEL EVANS.—Pilot, Neath, Glamorganshire, South Wales—16 years.—Schooner “Cousins,” 96, Swansea, Brig “Devonshire,” 129, Swansea.—1. Yes, St. George's, Bristol, and English Channel, to North Foreland.—2. 1 am not.
- P. 87. ROBERT NEWMAN.—Pilot, Port of Cowes, Hampshire, Isle of Wight.—May 9th, 1859.—40 years.—“Cupid,” 42 register.—1. From the Owers to the Start Point, for which I am licensed on the English coast.—2. No.
- M. 88. THOMAS HOWLING.—Ship Master, 83, Waterloo Quay, Aberdeen.—London, May 14th, 1859.—Apprentice 5 years mate 2 years, master 24 years in sailing and steam ships.—“Earl of Aberdeen,” Steamer, 360 horse power, tonnage full 906, register 594, Aberdeen.—1. English Channel, north east-coast of England and Scotland, and west coast of Scotland.—2. Spain and Portugal, and parts in the Mediterranean Sea.
89. LORD DE ROS.—Though I said a great deal about the north-east coast of Ireland, my knowledge and experience of the sea (such as it is) is not professional; but from owning the small harbour of Strangford, I have been led to take interest in the coasting trade of that part of Ireland.—1. From Belfast to Carlingford.
- P. 90. JOHN WALLIS.—Pilot, Port of Cowes, Hampshire, Isle of Wight.—Bembridge, May 9th, 1859.—50 years.—“Hornet,” 42 tons register.—1. With the district for which I am licensed, from the Owers to Start Point.—2. No.
- S. 91. E. J. BEDFORD.—Commander and Admiralty Surveyor, Oban, N.B.—Engaged upon the coast survey of England and Scotland since 1832, previous to which was about 8 years on the coasts of North and South America.—1. Part of the west coast of England, the west of Scotland, from the Solway to Ardnamurchan Point in Argyll, also a part of the east coast of Scotland.
- P. 92. DANIEL JONES.—Newport Pilot, No. 9.—May 9th, 1859.—20 years.—1. Newport to Milford, Newport to Land's End.—2. No.
- P. 93. THOMAS JONES.—Trinity Pilot, Neath.—May 9th.—For 14 years.—I. From Lundy Island to King Road, both sides of the Channel.
- M. 94. ROBERT DONAL.—47, City Quay, Supervisor of Ballast Lighters to the Corporation for preserving and improving the port of Dublin.—23 years.—The Barque “Duncan Gibb,” of Dublin, 362 tons register; the Ship “Mandarin,” of Dublin, 425 tons register; the Brig “Coolock,” of Dublin, 262 tons register.—1. The south and east coast of Ireland.—2. American coast, Bay of Fundy, Gulf and River St. Lawrence, Newfoundland, &c.
- P. 95. ABRAHAM GILMORE.—Newport Pilot, No. 3, William Street, Pellgwely, Newport, Monmouthshire.—37 years.—Newport Pilot, “Isabel,” Pilot Boat No. 5.—1. Bristol Channel, from Milford Islands and Severn.
- P. 96. MR. HENRY RAY, SENR.—Newport Pilot, No. 57, Commercial Road, Newport, Monmouthshire.—37 years.—1. Bristol Channel from Longships to River Severn.
- M. 97. WERTER CLARK.—Master Mariner, Royal Mail Packet Service, Dover.—Dover, May 10th, 1859.—28 years.—Royal Mail Packet “Ondine,” 78 tons, Dover, 70 horse power.—1. The coasts of Kent, Sussex, Essex, Suffolk, and Norfolk.—2. The French coast from Cape La Heve to Dunkirk, the coast of Flanders and Holland from Dunkirk to the Texel.
- P. 98. RICHARD ANDREW.—Pilot, St. Mawes, Cornwall.—May 9th, St. Mawes, Cornwall.—4 years at sea.—1 have charge of the Pilot Boat “Andrews,” of Falmouth, 50 tons.—1. England and Wales.—2. Very little.
- M. 99. ANDREW LINKLATER.—Master, 62, Virginia Street, Aberdeen.—May 9th, 1859.—19 years.—“Agricola,” of Aberdeen, 158 tons, port of registry, Aberdeen.—1. East coast of England and Scotland.
- P. 100. THOMAS DAVIS.—Pilot, Sea View, near Ryde, Isle of Wight.—April 9th, 1859.—60 years.—“Gratitude,” 33 tons, port of Cowes.—1. From the Owers to the Start.
- M. 101. JAMES TULLOCH.—No. 14, St. Clement Street, Aberdeen.—May 13th, 1859.—42 years.—Late of the “City of Quebec,” of Aberdeen, 526 tons.—1. Moray and Pentland Friths, and the whole of the north coast of Scotland.—2. Baltic coasts, North America.
- P. 102. WILLIAM COATS MOORE.—London Pilot, 3, Bromley Street, Commercial Road East, Stepney, E.—May 14th, 1859.—27 years.—1. English Channel, and the east coast of England.—2. North and Baltic Seas and Gulf of Finland.
- P. 103. HENRY BEVERLEY DISNEY.—Trinity North Sea Pilot, Lowestoft, Suffolk.—60 years.—1. The eastern coast of England and Scotland.—2. Coast of Holland, Jutland, and Norway.
- M. 104. WILLIAM TALBOT.—29, Constitution Street, Aberdeen.—Served 32 years.—“Aberdeenshire,” Steam Ship, 149 tons, Aberdeen, 50 horse power.—1. Yes, from the Humber to Cape Wrath.
- M. 105. WILLIAM HUTCHISON.—Kingstown, Dublin.—May 10th, 1859.—From 1806 to 1818, and Harbour Master since 1818.—1. From Wicklow to Skerries, Ireland.
- P. 106. WILLIAM PARFETT.—Pilot, 19, Temple Street, Pellgwely, Newport, Monmouthshire.—May 9th, 1859.—1. From Lundy Island to Newport.—2. No.
- M. 107. THOMAS SADLER.—Master of the Steam Ship “Sea Horse,” 43, Waverly Street, Hull.—May 10th, 1859.—Yes, 33 years.—Yes, the Steam Ship “Sea Horse,” 335 tons, Hull, 120 horse power.—1. Chiefly the east coast.—2. Chiefly the coast of Holland and Belgium.
- M. 108. WILLIAM ELLIOTT.—Master, No. 62, Osborne Street, Hull.—33 years.—“Neptune,” 173 tons, Newcastle, 90 horse power.—1. East coast of England.—2. Coast of Holland

Questions 35, 36, 33, 34, 1, 2.—*continued.*

109. GEORGE JAS. THOMPSON.—Pilot, 6, Archer Terrace.—Went to sea in 1818. In the pilot service from July 1831.—1. In the English Channel between London and the Isle of Wight. P.
110. CHARLES ALCOCK.—Merchant, Sunderland; and at Chingford, London, N.E.—14 years; 7 years coasting, 7 years foreign.—1. All of them nearly, by being in the coasting for 7 years.—2. American coast from Newfoundland to the West India Islands, Baltic to White Sea.
111. ROBERT WISE.—Master of the Screw Steamer "Fairy," King's Lynn.—May 12th, 1859.—About 40 years.—Master of the "Fairy," Screw Steamer of Hull, of 111 tons, and 60 horse power.—1. Generally with the east coast, but particularly from Lynn to Hull and Newcastle.—2. None. M.
112. JOHN EDEY.—Pilot, Cawsand, Cornwall.—53 years.—"Perseverance," Pilot Cutter No. 3, 37 tons new measurement.—1. English Channel. P.
113. FLETCHER LOWDEN.—Master of "Senhouse," Mary Port, Cumberland.—32 years.—"Senhouse," Tug and Passenger Boat, 50 horse power.—1. Yes, with the coasts in St. George's Channel, the Solway Firth, and coast from St. Bees Head to Liverpool in particular.—2. Only some of the West India Islands. M.
114. JOHN HARRISON.—Crosby, near Mary Port. Occupation none; retired from the service in 1854.—1 have served at sea from 1827 until 1854 (27 years), 23 of which as master exclusively in the foreign trade.—1. I am generally acquainted with the coasts of the St. George's and North Channel, and the English coast of the English Channel; also East Indies, Canadas, New Brunswick, and Nova Scotia; many other coasts slightly.—2. None in particular.
115. GEORGE METCALFE.—High Street, Mary Port.—26 years.—"Yarwath," 461 tons, Mary Port.—1. I am acquainted with the coast of the United Kingdom on both sides, also the coast of British North America.—2. I am acquainted with the west coast of South America and Mexico, also the coasts on the Mediterranean.
116. SAMUEL TAYLOR.—Retired, Salmon Parade, Bridgewater.—May 12th, 1859.—29 years.—"Rapid," 55 tons, "Lalla Rookh," 107, Bridgewater, "Ariel," 247, Bristol.—1. Bristol Channel from the Holmes down St. George's Channel to Clyde, English Channel to London.—2. Coast of Portugal, and the general navigation of the Mediterranean. M.
117. NICHOLAS JENKIN.—Pilot, St. Mawes.—"Nicholas Jenkin," Falmouth, 36 tons.—32 years.—1. Falmouth district.—2. None. P.
118. R. M. LAWYER.—Master Mariner, 46, Great Thornton Street, Hull.—May 11th, 1859.—51 years.—"Sea Gull," 355 tons, of Hull, 240 horse power.—1. Yes, the east coast of England.—2. The coast of Holland, from the Elbe to the Schelde, the coasts of Norway, Sweden, and Denmark. M.
119. WILLIAM ADAM.—Shipmaster, 4, Prospect Terrace, Ferry Hill, Aberdeen.—21 years.—Late ship "Parisian," now new ship building.—1. I am not well acquainted.—2. Yes, Malabar, Ceylon, and Coromandel.
120. WILLIAM GLINN.—Pilot, Turnchapel, Port of Plymouth.—In the piloting service for 15 years.—I do not.—1. Not any in particular. P.
121. ANDREW SMALL.—Examiner in Navigation for the Clyde Ports, under the Board of Trade.—Glasgow, May 7th, 1859.—30 years; 18 as master, and 8 years as mate.—1 command no vessel at present.—1. Yes, I have navigated for a number of years in the Irish and English Channel, and am well acquainted with the river and firth of Clyde, and from Liverpool to Holyhead.—2. I have frequently navigated on the Malabar coast, the Straits of Malacca, and the coast of New South Wales and south coast of Africa, also several parts of the United States, and the British Colonies in America. M.
122. JOHN SPINK.—Pilot Master, No. 3, West Dock Street.—3 years.—Steam Ship "Perth," tonnage 658, at Dundee, 300 horse power.—1. East coast of England to the Nore Light.—2. I am not acquainted. P.
123. HENRY SKILTON.—Pilot, Turnchapel, Port of Plymouth.—In the North American trade for 10 years.—1. Not any in particular. P.
124. JAMES HUNT.—Master, 3, Alceot Road, Grange Road, Bermuda, London.—Dublin, May 10th, 1859.—18 years.—"Ondine," Screw Steamer, 309 tons, Waterford, 100 horse power.—1. Between London and Dublin, and as far as Newcastle to the north.—2. Dutch coast. M.
125. RICHARD GREEN.—Pilot, Falmouth.—20 years at sea, including foreign going ships and piloting.—A Pilot Cutter, No. 10, Falmouth, tonnage 45.—1. Pilot district of the Port of Falmouth. P.
126. JOHN CHARD.—Licensed Pilot, 26, Wodehouse Terrace, Falmouth.—May 10th, 1859.—49 years.—"Telegraph," Pilot Cutter No. 4, 47 tons, Falmouth.—1. From the Scilly Islands to the Eddystone. P.
127. GEORGE WALTON MATTHEWS.—Commander, 47, Snargate Street, Dover, Kent.—1 have served at sea 11 years.—The "Empress," Mail Steam Packet, 123 tons, registered at Calais, 100 horse power.—1. South coast.—2. French coast, Calais and Boulogne. M.
128. JAMES NEWTON.—Trinity Cinque Ports Pilot, 24, Water Street, Deal.—Deal, May 11th, 1859.—From 1832 to the present time.—1. Yes, from Land's End, of England, to Yarmouth and all the entrances to the River Thames or Medway.—2. Yes, from Boulogne along the coast of Flanders, and Holland to the Texel. P.
129. THOMAS LEWIS.—Ship Master, 33, English Street, Hull.—30 years.—Master of the "Vigilant," Screw Steamer, of Hull, 174 tons, 50 horse power.—1. East coast.—2. Dutch and Danish coast. M.
130. R. W. CRAWFORD.—Shipping Master, 12, James Watt Street, Glasgow.—Nearly 40 years; upwards of 20 years in command of steamers in the Glasgow and Liverpool trade.—1. I am well acquainted with the coasts of the United Kingdom, not the Colonies.—2. Not now; great changes have taken place since I traded abroad, 35 years ago. M.
131. EDWARD TEMPERLEY GOURLEY.—Shipowner, &c., Sunderland.—May 12th, 1859.—No.—In my own yacht.—1. Only partially between the Tyne and Deal.—2. Know something of Norway. Y.
132. JOHN COW.—Messrs. F. Green and Co., 72, Cornhill.—May 11th, 1859.—38 years.—Not at present in command.—1. Well with the English south coast.—2. Not acquainted. M.
133. EDWARD BAYLEY.—Cliff Cottage, Rye.—May 13th, 1859.—Yes, 30 years.—Have commanded 20 years, now out of employ.—1. From Dungeness to the north of England. M.
134. THOMAS RALPH.—179, Beach Street Deal, Cinque Ports Pilot.—Deal, May 13th, 1859.—Yes, from the year 1827 to the present time.—1 commanded a yacht under the Royal Yacht Squadron, called the "Rowena," and second and chief officer to various parts of the globe.—1. Yes, from Eddystone Light up to Yarmouth Roads, and all harbours and rivers within that boundary, more especially from Spithead, and Thames, and Medway.—2. Yes, from Boulogne to the Texel, but particularly between Walcheren and Boulogne. P.
135. WILLIAM CULLIS.—Pilot, Cawsand.—17 years.—Not commanded.—1. From Land's End to the Downs.—2. No. P.
136. JOHN TURNER.—Master and Owner, 11, Union Street, Lynn, Norfolk.—49 years.—"George," 133 tons, Lynn.—1. Particular in the east coast.—2. Nearly all parts of the Baltic. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 137. E. GARWOOD.—Master Mariner, Stoke Street, Ipswich.—30 years.—“Eagle,” 56 tons.—1. From Harwich to the Humber.—2. The coast of Holland from Schaven to New Scarp.
- M. 138. RICHARD HOLLAND.—Ship Master, 2, Myrth Hill, Cork.—Cork, May 12th, 1859.—19 years.—“Bittern,” Steamer 451 tons.—1. English and Irish Channel.—2. Rotterdam and Dunkirk.
- M. 139. JAMES CRANE.—Master Mariner, Strand Street, Sandwich.—May 13th, 1859, Sandwich, Kent.—35 years.—The “Sandwich,” of Sandwich, Kent, 61 tons.—1. The coast of Sussex, Kent, and Essex.—2. France and Holland.
- M. 140. THOMAS DICKINSON.—Master and Shipowner, 26, All Saint’s Street, Lynn.—42 years.—“Katharine,” 129 tons, Lynn.—1. Particular in the east coast.—2. Nil.
- M. 141. HENRY C. RAYNES.—190, Lower Road, Cork, Ship Master.—Cork, May 12th, 1859.—15 years.—“Albatross,” Steamer, 406 tons register.—1. English and Irish Channel.—2. Rotterdam.
- P. 142. HENRY TONKIN.—Licensed Pilot, Anvenack Street, Falmouth.—40 years.—“Water Nymph,” Pilot Cutter No. 6, Falmouth, 45 tons.—1. Yes, from Scilly Islands to the Eddystone.—2. No.
- M. 143. T. TAYLOR.—Master Mariner, Fish Lake, County York.—May 13th, 1859, Sandwich.—23 years.—The “Albion,” of Goole, 53 tons.—1. The east coast.—2. No.
- R.N. 144. HENRY COTTER.—Captain, Portree, Skye.—37 years.—H.M.S. “Porcupine.”—1. Coast of Scotland.—2. Baltic, Gulf of Bothnia, Mediterranean.
- M. 145. FRANKLIN HALLET.—Messrs. T. and D. P. Sellar, Liverpool, Howland and Frothingham, New York.—Liverpool, May 14th, 1859.—36 years.—Ship “Endymion,” 1,327, New York.—1. I am acquainted with the north and south coasts of Ireland, and St. George’s Channel.—2. I have some knowledge of the Atlantic and Gulf coasts of the United States of America, and particularly of Massachusetts Bay and the approaches to New York.
- F.M. 146. R. DANNEBERG.—Et is al gûd on in en reight position, so mlusch ni nos.
- M. 147. THOMAS MUIR.—39, Senedon Street, Princes Bank, Liverpool.—40 years.—“Lord Elgin,” 859 tons, Ship, Cork.—I am well acquainted with the coast of Orkney Islands, west coast Scotland, Irish and St. George’s Channel to Cape Clear, south coast Newfoundland, Gulf and River St. Lawrence, with adjacent coasts.—2. Mediterranean generally, east coast of America, Georgia, United States, and part of Gulf of Mexico.
- M. 148. JOHN MILLAR.—12, Paisley Street, Liverpool.—27 years.—“Lindisfarne,” of Liverpool, 294 tons.—1. Irish Channel and the north coast of Scotland.—2. Brazils, Baltic.
- M. 149. ROBERT T. EMERY.—Ship Master, Bucksport Maine.—18 years.—Ship “Premier,” of Bangor Maine, 1,200 tons register.—1. Am well acquainted with the coast of the United Kingdom bordering on the English and St. George’s Channel.—2. Am well acquainted with the coast of the United States and west coast of south America.
- M. 150. GEORGE THOMAS WILLIAMS.—Of the after-named ship, to which address.—For 31 years, and in nearly every port in Great Britain have I been trading at different times.—I command the Brig “John Hillman,” 224 tons register.—1. The whole coast of England and Scotland, particularly the east parts thereof, and the south part of Ireland; the Colonies I am not particularly acquainted with.—2. The south and east coast of Spain, the west and south of Italy, Sicily, &c., with adjacent islands, east part of the American States, east part of South America, including Brazils, &c.
- F.M. 151. LOUIS ORPEREN.—Birkenhead Dock.—Capitaine du 3-mâts Français “Marianne,” de Mantes, de 308 tonneaux.
- M. 152. HERBERT MOSS.—39, Sophy’s Street, Liverpool.—20 years.—“Fulchan,” 290 tons, Liverpool.—2. The north coast of Brazils.
- F.M. 153. P. FIGUTH.—Nufahrwasser, near Danzig.—Prussian Barge “Carline La Sonne,” belonging to Danzig, about 300 tons.—1. All round the coast of England, Seathland, and part of Zealand, and Canada.—2. Norway, Sweden, Denmark, Prussia, and part of Russia, in Baltic, France, Mediterranean.
- M. 154. JOHN CHRISTIE.—Master Mariner, 14, Water Street, Liverpool.—May 18th, 1859.—28 years.—“Corfield,” 571 tons, Sunderland.—1. East coast.—2. No.
- M. 155. CHARLES EVANS.—Master, 5, Park Street, Bristol.—Ship “Rhen Sylvia,” of Bristol, 881 tons.—1. Mediterranean, America, north, south, and west coast.—2. Mediterranean.
- M. 156. PHILLIPS KINGDON INGLETON.—Master of “Castries,” Mersey View, Tatlock Street, Liverpool.—19 years, 9 months, 15 days.—“Castries,” 264 tons.—1. English and Irish and Bristol Channels.—2. Gulf of St. Lawrence, East and West Indies.
- F.M. 157. T. PETROWSKI.—“George Linch,” 720 tons register, Danzig.—1. South coast.—2. Baltic Sea.
- M. 158. GEORGE MANTLE.—61, Mill Street, Liverpool.—20 years.—“Lady Franklin,” of Liverpool, 446 tons.—1. South and east coast of Ireland, west coasts of England and Wales, also the navigation of Bristol Channel.—2. Most of the West India Islands, Gulfs of Mexico and Florida, also northern coast of Brazil, including particularly the passage to and from Maranham.
- M. 159. ROBERT COWAN.—Ship Master, 85, High Street, Dumfries.—40 years.—Master of Barque “Wreath,” of the Port of Dumfries.—1. St. George’s and North Channels, Gulf and River St. Lawrence, Bay of Fundy.—2. East coast of New Grenada, coasts of South Africa, &c.
- M. 160. RICHARD KEATS.—Master Mariner, Bedminster, Bristol.—12 years.—Ship “Osprey,” 768 tons, of Bristol.—1. Not well.—2. None particularly.
- M. 161. PHILIP JOHN DAVEY.—Master Mariner, 15, Everton Road, Liverpool.—20 years.—Ship “Peveril of the Peak,” of Liverpool, 713 tons register.—1. St. George’s and Liverpool Channels, and the approaches to Calcutta River.—2. No.
- F.M. 162. CHRISTIAN HÄUSEN.—Captain, Flensburg.—26 years.—Brig “Hercules,” 246 tons, of Flensburg, Denmark.—1. Not much, not having been much in England.—2. With some of the West India Islands.
- M. 163. WM. CHINNERY.—Commanding after-named Ship, No. 8, Charles Street, Davenport Street, Commercial Road East, London.—Age 44; served at sea 7 years; master 19 years.—“Osborn Elizabeth,” 198 tons, Faversham, Kent.—1. Yes, English Channel, north and Scotch coast, 20 years’ experience.—2. Yes, French coast, Dutch coast.
- F.M. 164. L. BACKER.—Of Christiana.—From 1810.—Ship “Astracan,” 600 tons, of Christiana, Norway.
- M. 165. THOMAS BAIRD.—Master Mariner, Drumore by Stranraer.—From May 22nd, 1834.—Ship “Japanese,” 792 tons, Port of Liverpool.—1. I am well acquainted with all the coasts and channels of the United Kingdom, except the east coast of England.—2. I am well acquainted with the Cattegat, Baltic, Gulf of Finland, Mediterranean, east and west coasts of South America, Island of Mauritius, and the Bay of Bengal.
- M. 166. ROBT. B. SAMUEL.—Master, “Black Cat,” Llanelly, Carmarthenshire.—11 years.—“Black Cat,” 128 tons, Llanelly.—1. Three channels.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

167. T. H. KRÖGER.—Master, Blankenese, Hamburgh.—16 years.—“Avance,” 109 tons, London.—1. Yes, the English Channel.—2. Yes, the principal parts of the North Sea, to the Mediterranean, to Malta, French coasts, Spanish and Portugal coasts. F.M.
168. JAMES HINDSON.—Master Mariner, bound to Alexandria, Egypt, No. 24, Great George's Square, Liverpool.—24 years.—“Ellen,” Barque, of Liverpool, 368 tons, Sailing Vessel. M.
169. H. HERON.—Master, Messrs. Leech, Harrison, and Forwood, North John Street, Liverpool.—5 years an apprentice, 2 an officer, and 30 captain.—The “Mystery,” 424 tons, of Liverpool. M.
170. JOHN BENFIELD.—Master, No. 33, Claremont Terrace, Bootle Lane, Kirkdale.—26 years.—“Locomotive,” 197, Bristol.—1. Waterford, Dublin, London, Cardiff, Falmouth, Plymouth.—2. Cadiz, Alicante, Marseilles, Gibraltar, Barcelona. M.
171. Captain MORQUIRES.—Brig, “Nuevo Victoria.”—Being ignorant of the coast of Great Britain, I am unable to answer the questions contained herein. F.M.
172. JOHN L. HAUSAM.—Master.—12 years.—Ship “Judah Louro,” 740, Boston, United States of America.—1. Yes, St. George's, Bristol, and North Channel.—2. Yes, America, and British America, West Indies, and France. M.
173. WM. BURTON.—Master, Ship “Wyoming,” Philadelphia.—20 years.—Ship “Wyoming,” of 891 tons, of Philadelphia, 1½ years.—1. I am tolerably well acquainted with the St. George's and North Channel.—2. The eastern coast of America, which has been much improved in a few years. F.M.
174. T. E. GALES.—Littlehampton, Sussex.—Yes, 35 years.—“Bolina,” Liverpool, 403 tons.—1. British Channel, and the coast of the Cape of Good Hope.—2. I am not well acquainted. M.
175. JOHN SERGENT.—India Trade, Grove Road, Panama Place, Wallasey, Cheshire.—21 years.—“West Derby,” 820 tons, Liverpool.—1. English and St. George's Channels, Malabar and Coromandel coasts.—2. Coast of Brazil. M.
176. G. SCHEPKE.—Von Danzig.—1838 bis gegenwärtig Barcke “Alice and Flax.”—To 357 Danzig, Segelschiffer.—Alles angeführt ist gut, und habe, nichts gegen einzuwenden, nur die Looksee an der Ostküste Englands sollten die Schiffe ausser der Bahre mit Looksee versehen; ich bin in Hartlyport in Jahre 1858 den 10th Novbr., gegenwärtig gewesen wie Schiffe mit Bahrsegel (Ost Wind) nicht besetzt wurden, weit Schwell auf der Bahre war mussten draussen halten, des Nachts wurde harter Sturm, und mehrere Schiffe gingen verloren. Dies war schrecklich anzusehen, wie Schiffe Geinen Looksee erhielten, auch Rein Signed gegeben wurde die Schiffe einzuwinken. G. Schepke, von Danzig, Führer der “Alice and Flax.” F.M.
177. THOMAS ROBINSON.—Master, Newcastle, 15, Low Buxton Street.—30 years.—Barque “Margaret,” 218, Newcastle.—1. Both east and west coast of England and Scotland.—2. Baltic, &c. M.
178. JAMES KIDD.—Master, Barque “Reward,” No. 20, Upper Pit Street, Liverpool.—13 years.—“Reward,” of London, 325 tons. M.
179. F. E. JENKINS.—9, Hardy Street.—14 years.—“Australia,” 1,028, Liverpool.—1. Welsh coast from Milford to Holyhead, coast of Ireland from Cape Clear to Dublin.—2. Black Sea, United States of America, from Charleston south to Belize. M.
180. CHARLES FROST.—Sandock Dock, or Messrs. Boulton, English, and Brandon, Liverpool.—May 17th, 1859.—I have served at sea 21 years.—I command the American Ship “Kittie Floyd,” 1,117 tons, registered at Portland, State of Maine.—1. I have made a number of voyages from America to Liverpool, consequently am more or less acquainted with the coasts of Ireland and Wales.—2. I presume that I am as well acquainted with the north-east coast of America as any. F.M.
181. CHAS. COLLINS.—Care of Guion and Co., 2, Tower Chambers, Liverpool.—16 years, 10 of which as commander.—“Thornton,” 1,500 tons, New York, regular Trader.—1. Great Britain and United States of America.—2. North and South America. M.
182. J. KÖRNER.—Er ei del engelske sprag von magtig at jeg kan forthane und besbare namete Sporgsmaal. F.M.
183. 90, Newby Street, Walton Lane, Liverpool.—30 years.—“Euroclydon,” 1,325 tons, of Liverpool.—1. Irish and English.—2. United States of America. M.
184. WILLIAM FLETCHER SIM.—Master, Duke Street, Whitehaven.—11½ years.—“Ann Ingate,” 144, Whitehaven. M.
185. J. VANSELOW.—30 years.—Barque “Peter Rolt,” 476 tons register, belonging to Danzig.—1. I am only partially acquainted with the coast of the United Kingdom.—2. Some parts round all Europe. F.M.
186. WILLIAM GRAHAM.—Commander of the after-named ship, 18, Somerville Place, Birkenhead.—15 years.—“Colonist,” 751, Liverpool.—1. Not particularly with any part of either.—2. No. M.
187. ROBERT MCKNAUGHT.—Master Mariner; John Gray, Optician, 25, Strand Street, Liverpool.—16 years.—“Westbourne,” 192, Liverpool.—1. Coast of British Honduras.—2. No. M.
188. F. F. DALITZ.—Master, Danzig, 19, Burg Street.—42 years.—“Victoria,” 320, Danzig.—1. In general with the most parts of them. F.M.
189. C. ALI RASCH.—Master of the “London,” from Danzig.—Liverpool, May 15th, 1859.—25 years.—The “London,” 323 tons register, belonging to the port of Danzig.—1. No.—2. Prussia, Danzig Bay. F.M.
190. G. F. ANDREAS.—Master.—The Ship “Friedrich Gustav,” 500 tons.—Ich habe auf sämtliche Feurr. Bonje. und dergl. Nichts zu bemerken, nür befinde dieselbe für gut. F.M.
191. WILLIAM JARDAN.—Master Mariner, Thomaston, State of Maine.—25 years.—Ship “Cavalier,” 1,177 tons, New York.—1. English and Irish Channel.—2. United States. F.M.
192. T. CLEGHORN.—Clan Hotel, Limerick.—Limerick, May 17th, 1859.—20 years.—Brig “Faith,” 168 tons, London.—1. English Channel. M.
193. ALEX. ROBERTSON.—Master, 15, Main Street, Bridge End, Perth.—May 12th, 1859, Perth.—About 19 years.—“Telegram,” Perth.—1. East coast of England.—2. Swedish coast in the Cattegat. M.
194. WILLIAM BASTARD.—Seaman, Clay-next-the-Sea, Norfolk.—20 years.—The “Resolution,” Wells, 38 tons.—1. The north and east coast of England. M.
195. EDWARD HIGHT.—17, Circus Road, St. John's Wood, and 72, Cornhill.—May 18th, 1859.—36 years.—“Abwick Castle,” 1,087 tons, London.—1. I am well acquainted with the south-east coast of Kent, also the coast of the British Channel from Land's End.—2. I am well acquainted with the coast of the Bay of Bengal, from Ceylon to entrance of the Hoogly, also south coast of Africa, Cape of Good Hope. M.
196. ALEXANDER NEILL.—Mate, Steamer “Waterloo.”—May 22d, 1859.—12 years.—1. English and Irish Channel from Gravesend to Londonderry.—2. No. M.
197. JOHN GOOD.—Master of “Titania.” A letter addressed to me, care of John Good, High Street, Hull, will be taken care of and forwarded to me as soon as practicable.—Bristol, May 16th, 1859.—I have been 30 years at sea, the last 22 as master, and the last 7 as master and part owner in the North American, Mediterranean, Indian, and

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- Australian trades.—1 now command and partly own the Barque "Titania," of 485 tons, belonging to the port of Newcastle, and am at present residing at 36, Queen's Square, Bristol.—1 possess such knowledge of the English Channel as the experience of its successful navigation and command of a merchant vessel in the long trade for a period of 20 years has enabled me to acquire.
- M. 198. GILES HEYLER.—Master Mariner, South Street, Bridport.—May 14th, 1859.—48 years at sea.—"Dorset," of Bridport, 55 tons.—1. Well acquainted all round the United Kingdom and Channel Islands.—2. No.
- M. 199. ARCHIBALD WHITE.—Master of "Lynn," 12, Anderston Quay, Glasgow.—Belfast, May 14th, 1859.—40 years.—"Lynn," 314 tons, registered at Glasgow; 240 horse power.—1. Well acquainted from Glasgow to Belfast and Liverpool.—2. Not acquainted.
- M. 200. WILLIAM ABRAMS.—On board.—27 years.—"Sarah Princess," 172 tons, Dartmouth.
- M. 201. G. GAMBIVILL.—Master, 4, Kirch Place, Stroud, Kent.—May 14th, 1859.—30 years.—Yes, the "Argus," of London, 60 tons register.—1. West coast of England.—2. Portugal and Spain.
- M. 202. ALEXANDER LAURENCE.—Master Mariner, 38, Oakley Square, St. Pancras.—May 14th, 1859.—33 years.—"Orient," of London, 1,032 tons.—1. With the English side of the English Channel, and know most of the lights on the east coast of England and Scotland.—2. No, except the Straits of Malacca, and south coast of Australia.
- P. 203. DANIEL SYDAL.—Pilot Master, Lynn, Norfolk.—May 12th, 1859.—30 years.—1. North-east and south-west coast of England.—2. Norway and Baltic.
- M. 204. OSWALD BRODIE.—Master Mariner, No. 9, Bath Street, South Shields.—May 13th, 1859.—44 years.—Unemployed at present.—1. Yes, the east coast of the United Kingdom.—2. Not particularly; decline giving an opinion.
- M. 205. ANDREW LARGIE.—Worn-out Master, Montrose, Hill Street.—May 14th, 1859.—50 years.—1. Pretty well with coasts.—2. Principally the Baltic.
- M. 206. Captain VAGGARS.—Master Mariner, Appledore, Devon.—May 14th, 1859.—18 years.—Schooner "Pomona," 69 tons.—Bideford.—1. All parts.—2. The coasts of France.
- M. 207. S. SILBOWLE.—Waterloo Terrace, Cork.—Since 1817.—At present the "Osprey," Screw Steamer, 100 horse power, Cork.—1. I am well acquainted with the coasts in the three Channels.—2. The North Sea, Baltic, and the Gulf of Finland.
- M. 208. JOHN FURN.—13, Balmain Street, Montrose.—May 13th, 1859.—For 41 years.—Worn-out Master.—1. Pretty well acquainted with the coast in the United Kingdom.—2. Principally in the Baltic.
- M. 209. JAMES STEPHEN.—Harbour Master, Montrose.—May 13th, 1859.—14 years.—Has commanded several vessels, varying from 50 to 230 tons, for 32 years.—1. Pretty well from John o' Groats to the Wolf's Rock, Land's End of England, that is to say, by the east coast.—2. Pretty well in the Cattegat, Baltic Sea, Gulf of Finland, &c.
- M. 210. JOHN SHEA.—Ship Broker, 6, James's Street, Tralee.—20 years out of Liverpool.—Not at present.
- M. 211. JAMES TAYLOR.—Master Mariner, Free School Lane, Rochester.—20 years in the coal trade.—Brig "West Kent," of Rochester, 228 tons register.—1. North-east coast of England.—2. None.
- M. 212. ROBERT PIKE.—Walker's Buildings, Upper Thames Street, South Shields.—About 22 years.—Unemployed at present.—1. North-east, south, and west coasts of England.—2. Coasts of Portugal, Spain, and coasts of the Mediterranean Sea.
- M. 213. THOMAS HENDERSON.—Merchant and Shipowner, 45, Union Street, Glasgow.—Glasgow, May 16th, 1859.—21 years.—I have commanded all classes of sailing ships and steamers up to 440 horse power, all registered at Glasgow, but have not been at sea since 1852.—1. St. George's Channel, North Channel, Fifth of Clyde, west coast of England, coast of Wales, coast from the Mersey to the Clyde, coast of Scotland from the Clyde to the Hebrides, coast of Ireland, and Isle of Man.—2. Coast of Portugal, Spain, south of France, Italy, Sicily, Algeria, south coast of Newfoundland, Gulf and River St. Lawrence, west coast of Africa from the Cape of Good Hope to Walwich Bay, east coast Bay of Bengal from Maulinein to Singapore, the coast of Sumatra, and West India Islands.
- M. 214. WILLIAM WISHART.—Shipmaster, 35, Commerce Street.—Montrose, May 14th, 1859.—19 years.—Schooner "Falcon," Newcastle Trader.—1. Pretty well acquainted.
- M. 215. JOHN GREIVE.—Clachnaharry, Inverness.—May 12th, 1859.—38 years.—"Britannia," 77 tons, Inverness, Sailing Vessel.—1. Betwixt Newcastle and Inverness.—2. No.
- M. 216. DAVID MENZIES.—Shipmaster, Commerce Street, Montrose.—35 years.—"Christopher Newton," 417 tons, of Montrose.—1. The whole coast of the United Kingdom.—2. Baltic.
- M. 217. WILLIAM COATS.—Clerk in the night office under the Coal-turn Act, since 1857, 6, Mitre Street, Shields.—43 years.—The last ship I served in was the "Cumberland," of Newcastle, 284 tons; I commanded her 24 years.—1. East coast of England between the Tyne and Thames.—2. Sleeve, Cattegat, and Baltic.
- M. 218. J. C. TIDEY.—Licensed Victualler, Ship and General Smith, Chain and Anchor Manufacturer, Fitter of the New Lights for Sailing Vessels, Cutters, and Dock Yard Lighters; address Crown Inn, Strand, Swansea, Wales.—36 years.—I have commanded the following vessels:—The Brig "Russel," years of Arundel, Barque "Cloade," of Shoreham, Schooner "Wanderer," of Shoreham, Brig "Charles," of Shoreham, Brig "Fanny," and Barque "Marstrand," both of the same port.—1. The three Channels and the coast in general.—2. The White Sea, Baltic, Mediterranean, Black Sea, Sea of Azov, coast of Chili, South America, Bay of Bengal, Isle of France, &c.
- P. 219. HENRY PEARSON.—North Sea and Channel Pilot, Balaclava Cottage, Walmer Road, near Deal, Kent.—I have been to sea for 26 years in different sort of capacities.—1 command a vessel 17 tons register, named "Cosmopolite," of Deal, but I have piloted ships to those parts mentioned from 1,700 tons to 50 tons.—1. I am acquainted with the English coast from Portland to the Firth of Forth.—2. I am acquainted with the foreign coast from Calais, with the Belgian and Dutch coast as far as the Texel, New Deep.
- M. 220. THOMAS BULLEY.—Master Mariner, 251, Bedford Street, Toxteth Park, Liverpool.—37 years.—"Mezerium," 238 tons, Shoreham.—1. South and east coast of England, south coast of Ireland, St. George's Channel, the Clyde.—2. Mediterranean from Cape Sparteel to Syria, Constantinople, South America, near the River Plate.
- M. 221. JOSEPH SAMSON.—Ships' Husband, to Mark Whitwell and Son, 1, Harford Place, Bristol.—May 15th, 1859.—50 years.—Last vessel the "Tay," of Bristol; been ashore 2½ years.—1. Bristol, St. George's, English Channels, United States of America, and Gulf of St. Lawrence.—2. No.
- P. 222. ISAAC NEWBY.—Pilot, 12, Pilot Street, Lynn.—24 years.—"Missionary," Pilot Boat, 16 tons, Lynn.—1. East coast of England, between Winterton Ness and the Humber.—2. None.
- M. 223. PETER CUMMING.—Master of the Schooner "Margrets," Isle of Whitborn.—May 14th, 1859.—39 years at sea.—Master of the Schooner "Margrets," 92 tons register, Custom House, Wigton.
- P. 224. GEORGE AUSTIN.—Pilot, Castle Street, Ryde, Isle of Wight.—30 years.—For Pilot Boat until I obtained my licence.—1. Well acquainted from the Start to Duogeness.—2. No.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

225. GEORGE BOWEN.—Ship Builder and Overseer of the Poor of St. Dogmils, Cardigan, Plamwidd, St. Dogmils, New Cardigan, South Wales.—May 13th, 1859.—I have served at sea for 46 years.—The Schooner "Magdalen," of Cardigan, 102 tons register.—1. I am, all over Wales and Ireland, and the principal part of England and Scotland.—2. The Gulf of Finland, Russia.
226. RICHARD ARNOLD.—Fisherman and North Sea Pilot, Kingsdown, near Deal, Kent.—May 16th, 1859.—40 years.—1. Yes, from Beachy Head to Flamborough Head.—2. Yes, from Cape Griznez to the Texel. P.
227. J. CROSS.—Master Mariner, Linnaea Street, Hull.—May 15th, 1859.—30 years.—"Irwell," Hull, 466 tons, 90 horse power.—1. Yes, the east coast of England.—2. Yes, the Holland coast, the Danish coast, and the coasts generally in the Baltic Sea. M.
228. THOMAS ANDERSON.—Shipowner, 52, Villiers Street, Sunderland.—May 16th, 1859.—27 years; 21 as master.—Left sea 6 years ago.—1. I am generally acquainted with the coast of the United Kingdom, more particularly with the line of coast extending from Land's End in Cornwall, to the Orkney Islands.—2. Generally acquainted with the coast extending from Ushant in France to St. Petersburg, including Baltic and Gulf of Finland. M.
229. DANIEL FAIRBAIRN.—Master of the after-named Screw Steamer "Scandinavian," 37, Lester Street, Hull.—May 16th, 1859.—56 years, and 40 years as master.—Yes, the Steamer "Scandinavian," 310 tons, Hull, 96 horse power, screw.—1. Yes, the north-east coast.—2. Yes, the Norwegian coast from the Naze to Ferder, and the Swedish coast from the Norwegian frontier to Gottenburg. M.
230. JAMES DICK STEWARD.—Commander, Steam Ship "Alhambra," Peninsular and Oriental Company's Office, Southampton.—Served in sailing ships from 1835 to 1845; since then in the Peninsular and Oriental Company's Steamers.—Steam Ship "Alhambra," 373 tons, 160 horse power.—1. Best acquainted with English Channel from Southampton to the Start.—2. Coast of Spain and Portugal from Vigo to Gibraltar, also Mediterranean to Alexandria and Constantinople, and from Malta to Marseilles. M.
231. JOHN ROUNCE.—Ship Agent, Lowestoft.—20 years.—1. Yes, with the whole of the coast of the United Kingdom.—2. Yes, Spain, Portugal, Italy, Holland, Denmark, Sweden, Russia.
232. WILLIAM ATON.—Lower Walmer, near Deal, Kent.—May 16th, 1859. My present occupation is fishing, but chiefly as a pilot to the above-mentioned places.—16 years.—I command the Lugger "Stormaway," of 20 tons, registered at Deal.—1. I am acquainted with the British coast from the Bill of Portland to the Firth of Forth.—2. I am also acquainted with the foreign coast from the Elbe, to Calais. P.
233. GEORGE GRAHAM.—Ship Broker, Hartlepool.—May 14th, 1859.—25 years; 17, master, 6, mate, and 3, apprentice.—Not at present.—1. East coast of England, from the Lizard to Pentland Firth.—2. East coast of North America from the St. Lawrence to the West India Islands, Cattegat Sound, Grounds, East Sea, and Gulf of Finland. M.
234. JOHN HARRISON.—Master Mariner, St. Hilda Hotel, St. Mary Street, Hartlepool.—Hartlepool, May 15th, 1859.—1 have served at sea 39 years, 28½ as master.—Neither at present; North Sea Pilot occasionally.—1. North-east coast of Scotland; north-east, east, and south coasts of the United Kingdom; English, Bristol, and St. George's Channels, &c.—2. Baltic, Gulfs of Finland and Bothnia, Cattegat, Sleeve, coast of Norway, River Elbe, and the entrances thereto, White Sea, and coasts of North America, Dutch and Jutland coasts. M.
235. MARK BULMER.—Master and part Owner, Queen Street, Hartlepool.—36 years; 27 of which as master.—"Arman," of Scarborough, 325 tons.—1. With the east coast of England from the Tyne to London.—2. With the Elbe and the neighbouring coast. M.
236. ABRAHAM APPEYOND.—Harbour Master, Scarborough.—21 years.—Master of "Economy," "Bee," "Samson," and "Confidence," all square-rigged, altogether 18 years.—1. East coast and English and Bristol Channels.—2. French and Holland. M.
237. JEREMIAH HUDSON.—68, North Marine Road, Scarborough.—Served 7 years apprenticeship, and am now grey-headed. Retired from actual service about 10 years, but goes in my own steamer now.—The Steamer "Fame," 220 tons gross, 117 net.—1. I have been 18 times round England, Ireland, and Scotland, through the Linross and inner Sounds.—2. Archangel, Baltic, coast of France, Spain, Portugal, Bosphorus, West Coast, Black Sea, and the Danube. M.
238. PETER SMITH.—Ship Builder, Ayr.—6 years.—1. Clyde.
239. JOHN GRAY.—Newton Terrace, Ayr.—38 years.—Left the sea 6 years ago; but the vessel I had last was the Ship "Helen Thomson," of Ayr, 544 tons register.—1. The Clyde.
240. GEORGE CAMPBELL.—Steamer "Caledonian," Ayr.—May 17th, 1859.—18 years.—I command the Steamer "Caledonian," of Glasgow, 115 tons register, and 80 horse power.—1. From Holyhead to the Mull of Cantire, including the Solway Firth and Firth of Clyde. M.
241. JOHN McEWEN.—Ship Master, Harbour Street, Ayr.—29 years.—"Scotia," 82 tons, Glasgow, 80 horse power.—1. From Cumby Island down George's Channel, Bristol and English Channels.—2. Mediterranean and parts of France, West Indies, &c. M.
- 242.—JOHN ARMSTRONG CUTHBERTSON.—Retired Ship Master, Ford Terrace, Dartmouth.—May 17th, 1859.—Entered the merchant service in 1815, retired in 1847, was 22 years a master mariner.—1. English Channel, from Land's End to Downs, also the Bristol Channel.—2. Coast of Portugal, south coast of Spain, West India Islands, Newfoundland, South America, from Pernambuco to the River Plate. M.
243. ANDREW MILNE.—15, Hill Street, Montrose.—May 17th, 1859.—40 years.—"Agnes," 93 tons, of Montrose.—1. From the South Foreland to Dunsbay Head, pretty well.—2. In the Baltic, pretty well. M.
244. THOMAS RALPHS MOWLE.—Pilot, 54, Middle Street, Deal.—Deal, May 18th, 1859.—Yes, 7 years.—1. Ireland, from Cape Clear to Tucker Light.—2. Spain and Portugal, from Cape Finisterre to Cape St. Vincent, France, Flanders, and Holland. P.
245. PETER OWENS.—Master of the "Brian Boircimhe," Drogheda.—May 16th, 1859.—30 years.—"Brian Boircimhe," Steamer, 226, "Drogheda," 300 horse power. M.
246. THOMAS KERR.—Anderston Quay, Broomielaw, Glasgow.—Glasgow, May 16th, 1859.—26 years.—"Druid," Steamer, of Campbelton, 120, 120 horse power.—1. From Cape Wrath to Bristol Channel, including Ireland.—2. No. M.
247. HENRY BELL.—Mariner, Workington, Cumberland.—63 years.—"Friends of Workington," 97 tons.—1. I am not.—2. No. M.
248. WALTER CAWS.—Pilot, Sea View, near Ryde, Isle of Wight.—May 16th, 1859.—A pilot for the Portsmouth and Cowes district 19 years.—1. The English Channel on the coast of England, more particularly in my district as pilot from the Owers eastward to FEVEREL Point west, and the ports of Portsmouth and Cowes.—2. Not well acquainted with foreign coasts. P.
249. ARCHIBALD COWAN.—Master Mariner, Gatehouse, of Fleet, North Britain.—May 16th, 1859.—51 years.—"Elizabeth," of Dumfries, 21 tons.—1. All round the United Kingdom.—2. Baltic. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 250. DAVID JAMES.—Surveyor to Lloyd's Register, Cardigan.—May 16th, 1859.—43 years.—“Olive,” 100 tons, now 78, of Cardigan, is the last I commanded.—1. All the coast from the Downs to Land's End, thence to Bristol, thence to Liverpool, and from thence to the Clyde, and all round Ireland.—2. Rotterdam, Antwerp, Ostend, Guernsey, Havre, Nantes, Bourdeaux, St. Andre, Gibraltar, Palermo, and Massina.
- M. 251. JOHN M. S. JONES.—Loading for Gibraltar, by J. Glynn and Sons, Liverpool.—May 14th, 1859.—27 years.—“Hortense,” 173 tons, of Fayal (in the Azores).—1. With the Bristol Channel mostly.—2. Often visited the ports of New York, Boston, and Norfolk, in Virginia; also those of South America.
- P. 252. SILAS HARVEY CAWS.—Pilot, Sea View, Ryde, Isle of Wight.—“Gipsy Queen,” R.Y.S., Cowes.—May 17th, 1859.—I have served at sea 34 years.—I am Acting Master and Pilot of the “Gipsy Queen,” R.Y.S., 190 tons, of Cowes.—1. I am particularly acquainted with the coast from the Owers to Portland, and generally acquainted with the English Channel.
- M. 253. JOHN MCKIRDY.—101, Miles Street, Toxteth Park, Liverpool.—30 years.—“Champion of the Seas,” 1,946 tons, Liverpool.—1. I am acquainted with the English and St. George's Channels, and the coasts of Australia.—2. China, and the west coast of South America.
- M. 254. WILLIAM CAMPBELL.—Master of the “Duke of Richmond” steamer, 4, Millburn Street, Aberdeen.—Granted, May 16th, 1859.—54 years.—“Duke of Richmond” Steamer, 260 tons, port of Aberdeen, and 220 horse power.—1. Firth of Forth to Shetland.—2. I have not been foreign for many years.
- M. 255. PHILIP HEANEY ST. PATRICK.—Rose Hill Cottage, Drogheda.—45 years.—“St. Patrick” Steamer, 269; 300.—1. St. George's Channel, well lighted. Been 20 years or more in steam in the Channel.—2. Not at present much acquainted with the foreign lights.
256. JOHN R. THOMPSON.—Shipowner, Church Street, Whitehaven.—Whitehaven, May 12th, 1859.—18 years.—Resigned command.—1. Yes; Cumberland and Irish coasts, in the United Kingdom and the Windward Islands, British Guayana, &c. in the Colonies.—2. Yes; French Guayana, and their colonies in the West Indies.
- M. 257. WILLIAM DAVIES.—Retired Ship Master, 39, Hill Street, Hakin, Milford Haven, South Wales.—37 years.—1. English, Bristol, and St. George's Channels.—2. Mediterranean, Baltic, and the Gulf of Finland.
- M. 258. GEO. M. K. DONNAN.—Master Mariner, Office, 19, Donegal Quay, Belfast; Residence, 17, Brougham Street, Belfast. First address is most certain.—17 years in foreign-going sailing vessels; 3 years home-trade steamer.—“Cambria” Steamer, 314 tons, Kinross, 140 horse power.—1. Yes; South coast of Ireland, St. George's Channel, Irish Sea, Clyde to Cambrae Island; also Bristol and English Channels.—2. Spanish and Portuguese; from Cape Ortegal to Gibraltar; particularly about Cadiz and Gibraltar.
- M. 259. ROBERT HEMETT.—No. 2, Worsley Street, Benerby Road, Hull.—26 years; 8 years Master.—“Velocity,” 60 horse power; “Antelope,” 100 horse power.—1. East coast.—2. No.
- M. 260. THOMAS KENNETTS HARRY.—St. Ives, Cornwall.—May 19th, 1859.—44 years.—“Mary,” of St. Ives, 110 tons; “Albert,” Falmouth, 160 tons; and “Edith,” Falmouth, 460 tons.—1. South or English Channel, St. George's, and Bristol.—2. West coast of France, Mediterranean, west coast of Africa, east coast of Brazil, Azores.
261. WILLIAM MILMAN.—No employment. Above Town, Dartmouth.—28 years.—1. From Scilly to the Downs, with all the harbours, roads, and anchorages.—2. The whole of the ports in the Mediterranean.
- M. 262. ALEX. RODGER.—9, Alhottford Place, Glasgow. I have the management of the ships “Kate Cairne” and “Ellen Rodger,” partly owned by me.—I became Master in Jan. 1827; left off going to sea Sept. 1857.—Have retired from sea.—1. I am acquainted with the English, St. George's, and North Channels.—2. I am acquainted with the Straits of Sunda, Java Sea, Singapore, Rhio, and Malacca Straits, and China Sea.
- Y. 263. ROBERT BROWN.—Yacht Builder, No. 1, Montpelier Terrace, Ilfracombe, Devon.—Hakin, Milford Haven, May 16th, 1859.—32 years.—“Petrel” Yacht, 21 tons, Barnstaple.—1. St. George's Channel, Bristol Channel, from the Land's End, to the Bishops-and-Clerks, off St. David's Head, south coast of Australia, from Swan River to Sydney, and Cape of Good Hope.
- M. 264. R. J. SIMMS.—Master and Owner, London Road, Lynn.—34 years.—“Ivestone,” of Lynn, 220 tons register.—1. Particular on the north-east coast.—2. Not acquainted.
- P. 265. JOHN HOPPINS.—Pilot for the port of Plymouth.—No. 16, Parade, opposite Custom House.—Since 1826.—The “Whisper.” My brother takes charge when on board; in his absence I take charge.—1. Very well acquainted from the Land's End to Spithead.—2. Not with any foreign parts.
- M. 266. RICHD. JONES.—Master of ship, “Wm. Wright,” 3, Wynn Street, Caernarvon.—26 years.—“Wm. Wright,” of Liverpool, 752 register.—1. From Liverpool, round the Land's End, as far east as the Thames, Bristol Channel included.—2. From New York to the Gulf of St. Lawrence, the Mediterranean as far east as Smyrna, and the coast of Chili and Peru.
- C.E. 267. WILLIAM CLIGRAM.—Resident Engineer to the Gloucester and Berkeley Canal Co., a Younger Brother of the Trinity House, London, and Sub-Commissioner of Pilots for the Port of Gloucester.—May 16th, 1859.
- P. 268. NICHOLAS VINCENT.—Pilot, St. Mawes, Cornwall.—May 10th, 1859.—1. West coast of England.
- M. 269. GEORGE MORTON.—Captain of the “Swanland,” of Hull, No. 3, Edward Place.—May 9th, 1859.—30 years.—“Swanland,” S.S., 265, port 63, horse power 90.—1. The east coast of England.—2. From the Skaw to Dantzic, in Baltic.
- M. 270. JOHN REED POMEROY.—Master Mariner, 14, New Road, Brigham.—May 20th, 1859.—17 years.—“Sylph,” Dartmouth, 123.—1. South-east and west.—2. France, Spain, Portugal, and America.
- M. 271. RICHARD ROBINSON.—Master Mariner, Falcon's Place, Washington, Cumberland.—14 years.—“Wilfrid,” 138, Whitehaven.
- M. 272. JOHN BURCK.—Master of the “Sarah Wascoe,” No. 66, Upper Pitt Street.—15 years.—“Sarah Wascoe,” 325 tons, North Shields.—1. East coast England.—2. Mediterranean.
- M. 273. JOHN JAMES.—Greenfield, Cardigan; retired, owing to old age, and not very well off.—May 19th, 1859.—39 years.—Went Master on the Snack “Phoenix,” of Cardigan, 47 tons, in the year 1825; then the “Velox,” and the Schooner “Jane,” of Cardigan, 98 tons, until the year 1853. Refer you to the books.—1. Been coasting often all round England and Ireland.—2. Been many voyages to different ports in the Baltic as far as Petersburg, Holland, France, all along the bottom of the Bay, Portugal, Spain, as far as Marseilles; been into Larashe, Barbary.
- M. 274. WM. STEVENS.—St. Ives, Cornwall.—May 19th, 1859.—44 years.—I have commanded vessels in the foreign and coasting trade; likewise a steamer from Kayle to Bristol about two years; have left off the sea from the year 1846.—1. The English, Bristol, and St. George's Channels, south coast of Ireland; Bristol Channel particularly.—2. The coasts of Spain and Portugal on the Atlantic, south coast of Mediterranean, Cattedag, Belt, Baltic, and Gulf of Finland.
- M. 275. ROBERT ELSON CUMMING.—Master Mariner, Tor, Torquay.—26 years.—“Bonita,” $\frac{76}{13}$, of Dartmouth.—1. Cape Clear to Liverpool and London; Newfoundland.—2. Cape Race to Guirpore and Straits of Bellisle.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

276. JONAS DENHAM.—Coves Pilot.—Coves, May 20th, 1859.—35 years.—“Flora” Sailing Vessel, of Coves, 34 tons.—1. Coves and Peverel Point.—None. P.
277. PETER BROWN.—Master Ship “Julia,” 33, Queen Square, Bristol.—Bristol, May 20th, 1859.—30 years.—Ship “Julia,” 1,058 tons. Cork.—1. St. George’s, English, North, and Bristol Channels, and the Gulf of St. Lawrence.—2. South-west coast of South America, and the Gulf of Florida. M.
278. THOMAS LILLY.—No. 84, Great George Street, Belfast.—28 years at sea.—“Laurel,” of Lancaster, 189⁵/₁₀ tons, 180 horse power. In command of the same, and has been for the last five years, running four times a week from Belfast to Morecombe.—1. Pretty well acquainted with both the channels, having ran a screw steamer from Belfast to London seven years.—2. Not particularly acquainted with any foreign coasts, but have visited nearly every port of trade in the Mediterranean, and several of the West India islands. M.
279. ROBERT JOHN FUDGE.—Master, 102, New Church Street, Bermondsey, London.—May 17th, 1859.—26 years.—Screw Steamer “Victory,” of Limerick, horse power 180, tonnage 501.—1. Well acquainted with the whole of the coasting trade.—2. Mediterranean and Black Sea. M.
280. CHARLES SHIER.—Master Mariner, 5, Lempriere Street, St. Heliers, Jersey.—May 17th, 1892.—33 years.—“Priscilla,” 87 tons, Jersey.—1. I am, from the Clyde to the Tyne down channel by Bristol Channel, Gulf of St. Lawrence, West Indies, and coast unto Trieste in Mediterranean.—2. Coast of Spain, and ports up to Trieste. M.
281. ADAM KILLOCK.—Master Mariner, Southampton.—50 years.—1. Generally.—France, Spain, and Portugal. M.
282. RD. HOSKYN.—Master, R.N., Admiralty Surveyor, Hollywood, Co. Down.—May 18th, 1859.—34 years.—1. East Coast Ireland. R.N.
283. WILLIAM H. EMBLETON.—Chief Officer steam ship “Pacific,” Galway, Ireland.—May 20th, 1859.—27 years.—1. I am generally well acquainted with nearly the whole coast of the United Kingdom, but only specially so with part.—2. I am very well acquainted with the coast of North America from Cape Hatteras to Cape Breton. M.
284. H. WILLIAMS.—Captain, retired, Pool Street, Caernarvon.—May 21st, 1859.—40 years.—The last ship, “Almora,” Liverpool, 1,248 tons.—1. No place more particularly than another.—2. Most parts of the mercantile world. M.
285. ANDREW MONRO.—Shipowner, Limekilns, Fifeshire.—Limekilns, May 21st, 1859.—37 years continuously, and part of 2 seasons since.—1. With the whole coasts of the United Kingdom, but partially for the past five years.—2. The whole coasts of Europe, from the River Seine to Archangel, the whole Baltic included, and from Bilbao to the Danube, part of Brazil, Cape Horn, and Cape of Good Hope. M.
286. JOHN REID.—Shipowner, Limekilns, Fifeshire.—May 17th, 1859.—I have served at sea 39 years.—I commanded the brig “Helese,” 23 years, and brig “Daring” seven; the former 131, the latter 173 tons, both of this place, Borrowstoness district.—1. I have a general acquaintance of the coasts of the island, and in particular with the Firth of Forth.—2. With the Gategot, Baltic, Gulf of Finland, the Mediterranean, and particular acquaintance with Grecian Archipelago, Gulfs of Smyrna and Salonice. M.
287. R. H. HUDSON.—Master of the steamer “Heather Bell,” Little Ferry, by Golspic, Sutherlandshire, North Britain.—36 years.—I have commanded both sailing ships and steamers of various descriptions, for over 26 years.—1. All round the United Kingdom, the Gulf and River St. Lawrence, and upper Lakes of Canada.—2. The coasts of Denmark and those of the Baltic. M.
288. JOSEPH HOPPING.—1st class Pilot, port of Plymouth; address, 14, New Street.—I have served at sea 24 years.—I command the pilot cutter “Whisper,” of Plymouth, 36 tons register.—1. Not any in particular.—2. Not any. P.
289. D. HUGHES.—Master of ship “Eclipse,” E. C. Friend, and Co., 27, James Street, Liverpool.—26 years.—“Eclipse,” 393 tons, of Liverpool.—1. St. George’s Channel.—Brazilian and the United States, from New Orleans to Long Island. M.
290. ALEX. HILL.—I am Harbour Master in Port William, county of Wigtown; my address will be, Alex. Hill, Harbour Master, Port William, Wigtownshire.—Port William, May 21st, 1859.—I have served at sea between 42 and 43 years, always in the coasting trade.—I have commanded a vessel above 30 years, and the “Bargary” I have commanded the last 23 years; she belongs to Port William Head Custom House, Wigtown. M.
291. WILLIAM RANDALL.—Harbour Master, Port of Limerick.—May 20th, 1859.—I have served at sea 27 years, 17 of which I was in command.—1. I am well acquainted with the coast from Leith round south, down the English Channel, up Bristol Channel, along the Welsh coast, Saint George’s Channel, and around Ireland.—Well acquainted with the coasts of Spain, Portugal, and the Mediterranean, as far up as Sicily. M.
292. JOHN SMITH.—Master Mariner, Hartlepool, care of Mr. Peter Watt, Rowell Street.—Hartlepool, May 19th, 1859.—I have for 35 years.—Yes; at present the “Martindale,” of Hartlepool, 212 tons register, Sailing Vessel.—1. Yes; with the east and north-east coast of England.—2. Yes; with the coast of Germany, from the Elbe to the Texel. M.
293. JOHN LIDDELL.—Shipowner, Alloa.—May 13th, 1859.—40 years.—I have commanded ships out of this port from 1817 to 1851, and on shore since that date.—1. I have a general acquaintance with all the channels of Great Britain.—2. I have been a good deal in the Mediterranean, United States, British America, East Indies, China, and New South Wales. M.
294. JOHN OGLVIE.—Kincardine, Perthshire.—48 years.—“Maid of Perth,” of Greenock (barque), 193 tons register.—1. With the United Kingdom.—2. The Baltic, and coast of Holland. M.
295. JOHN CAMERON.—Ship Master, No. 7, Hope Terrace, Leith.—23 years.—Barque “Monarch,” 528 tons, port of Leith.—1. I am well acquainted with the east coast of Scotland, part of the west coast of do., and Highlands of Scotland; also the east coast of England, south-west coast of Newfoundland, Gulf of St. Lawrence, and Bay of Fundy. M.
296. CHARLES MILN.—Ship Master, Carron Street, Alloa.—Alloa, May 12th, 1859.—15 years.—Brig “Georgiana,” 264 tons register, Dundee.—1. I have a general acquaintance with the east coast.—2. Acquainted with the Baltic, White Sea, and Mediterranean. M.
297. MATTHEW HAY.—Master Mariner, Culmore, by Londonderry.—Liverpool, May 23d, 1859.—25 years.—“William M’Cormick” Steamer, of Londonderry, horse power 260.—1. I am well acquainted with the United Kingdom; not the colonies.—2. I am acquainted with the whole of the Mediterranean, Black Sea, Baltic, and White Sea. M.
298. JAMES JAMES.—Pilot, No. 5, New Street, Falmouth.—Served seven years as an apprentice to a pilot.—Pilot boat “Alarm,” 45 tons, Falmouth.—1. From the Land’s End to the Start Point and Seal: islands. P.
299. JAMES CONNELL.—Master Mariner, care of Donald R. Macgregor, Esq., Exchange Buildings, Leith.—23 years.—Brig “Sceptre,” 184 tons register, port of register, Leith.—1. I am well acquainted with all the north coast of Scotland, and the north and east coasts of England, including the English Channel.—2. Coast of Norway, Jutland, Denmark, Sweden, Prussia, and Russia. M.
300. DANIEL DRAPER CARTER.—Brig “William Barber,” Alma Road, Gt. Yarmouth.—May 24th, 1859.—14 years.—“William Barber,” 230 tons, Great Yarmouth.—1. North Sea, Cant, English and St. George’s Channels.—Mediterranean, Grecian Archipelago, Dardanelles, Sea of Marmora, Bosphorus, and Black Sea. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 301. T. DUFF, JUNR.—St. Mary's, Scilly, Cornwall.—May 22d, 1859.—28 years, 17 of them Master in the foreign and coasting trade.—At present the "Ariadne" yacht, 86 tons. "Little Western," screw, 35 horse power.—1. In the three channels.—2. I have been frequently in the Mediterranean.
- M. 302. WILLIAM STEPHEN ANDREWS.—Master "extra," and Naval Engineer in the Mercantile Marine. Occupation at present, Naval Architect and Ship Builder, Lowestoft, London, and Sidmouth, Steam Shipowner, and Naval Engineer.—30 years; 20 years in command; present age 43; Harbour Master, and Superintendent of Pilots, 1848 to 1854.—"Louisa" Schooner, of Sir Hyde Parker, 1839 to 1842. 1842 to 1848, Royal Mail Steam Ships "City Glasgow" and "Medway," 1,800 tons, 400 h. p.—1. Well acquainted with all the coast of Great Britain, Ireland, and West India colonies.—2. Spain, Portugal, France, and shores of Mediterranean, Norway, Sweden, Denmark, Russia, and the Baltic.
- P. 303. EDW. H. ALCOCK.—Pilot Master, Waterford Harbour.—May 23d, 1859.—15 years.—1. Has a general knowledge of the British channels and the American coasts.
- M. 304. HENRY WALKER.—Shipowner, 58, West Gate, Scarborough.—18 years.—1. Yorkshire coast, Mediterranean coasts, South Australian coasts.
- M. 305. JOHN BUSHELL.—Master of the "Gadabout," No. 3, Camden Square, Ramsgate, Kent.—23 years.—Command the Schooner "Gadabout," 93 tons; Ramsgate, port of registry.—1. Acquainted with the east and west coast of England.
- M. 306. JACOB SYMES.—Master Mariner, Bridport Harbour.—May 24th, 1859.—45 years.—"Nelson Packet," Bridport, 106 tons.—1. Well acquainted with all parts of the United Kingdom.
- M. 307. GEORGE WASAER.—Yarmouth, Isle of Wight.—May 23d, 1859.—40 years.—"George and Henry," Cowes, 10 tons.—1. Isle of Wight.
- M. 308. JOHN GIBSON.—At Mrs. Jackson's, St. Mary's, Scilly Isles. I have no occupation.—St. Mary's, Scilly, May 23d, 1859.—I have served from 1825 to 1855, during which time I was 20 years Master.—Not since 1855; the last vessel was the Schooner "Allegro," 100 by the last new.—1. I am acquainted with the coast of England from the Land's End to Tynemouth in Durham, Bristol Channel, St. George's Channel, south, west, and east coast of Ireland, and also the east coast of Newfoundland.—2. I am acquainted with the coast of Portugal, and south coast of Spain, the coast of Sicily, Adriatic, Southern at the mouth of the Danube.
- M. 309. EDWARD DANE.—Master Mariner, 1, Alma Terrace, Dover Street, Folkstone.—May 24th, 1859.—About 21 years.—"Pope Clementine," 147 tons, of London, horse power 180.—The north side and south side of the British Channel.
- P. 310. GEORGE GREENHAM.—Pilot, Sea View, Ryde, Isle of Wight.—Cowes, May 18th, 1859.—About 50 years.—At present I am Pilot and Acting Master of the yacht "Brunetti," 80 tons, of the port of Cowes.—1. I am well acquainted with the coast from the Owers to Portland.
- M. 311. JOHN ROBINSON.—Glennie Pause, Mill Lane, Folkstone.—27 years.—The "Pass Mary," 10 tons, London, 120 horse power.—1. South and west coast of England.—2. Holland, France, Spain, and Portugal.
- M. 312. JOHN JENKINS.—Master Mariner, Steam Packet Office, Folkstone.—32 years.—"Princess Helena," of London, 206 tons register, 190 horse power nominal.—1. North coast of England, east coast of Scotland, west coast of England, Bristol and St. George's Channel, south-west coast of Ireland.—2. Coast of France from Dunkirk to Channel Islands.
- M. 313. JOHN HACKING.—Master Mariner, St. Mary's, Scilly Isles, Cornwall.—May 19th, 1859.—28 years.—"Margaret and Jane," 324 tons, port of Scilly.—1. English, Bristol, and St. George's Channels, Sydney, Melbourne, Adelaide, Van Diemen's Land, Cape of Good Hope, Calcutta, and Torres Straits.—2. Island of Sicily, Malta, Smyrna, Constantinople, Odessa, Alexandria, Venice, Genoa, Leghorn, and Naples.
- M. 314. MATTHEW WARREN.—Shipowner, 5, Norfolk Terrace, Gloucester.—May 25th, 1859.—45 years at sea; 38 Master.—"Cyrus," of Gloucester, 52 tons register.
- M. 315. ISAAC DIXON.—Chief Mate, "Blenheim" steamer, No. 34, Sackville Street, North Everton, Liverpool.—Liverpool, May 25th, 1859.—I have served at sea 34 years.—I commanded the "Manx Fair" Steamer, Ramsey, 200 tons, 200 horse power, for four years.—1. I am acquainted with St. George's Channel, the North Channel, and all round the Isle of man.—2. I am not particularly acquainted with any foreign coasts, although I have been 23 years in the foreign trade.
- M. 316. RICHARD QUANCE.—Cornwall Terrace, Penzance.—May 21st, 1859.—About 30 years.—Barque "Arethusa," 249 tons, Penzance.—1. I am well acquainted with the St. George's, Bristol, and British Channels.—The coast of Portugal, Mediterranean, on both sides, Black Sea, and Sea of Azof, part of South America, River Plate, West Indies, and west coast of South America.
- M. 317. H. R. HONEY.—Master of ship "Amazon," London Docks.—London, May 25th, 1859.—Since 1831.—Ship "Amazon," of New York, 1,800 tons.—1. English Channel, having traded to London the past 20 years.—2. United States, about the coast near New York, &c.
- P. 318. THOS. LOWERY.—Trinity Pilot, 16, Albert Square, Commercial Road East, Stepney, E.—May 18th, 1859.—16 years at sea, and 16 years as pilot in the Trinity Service.—"Isabella."—1. Yes; the English Channel, east coast of England and Scotland, St. George's Channel, Bristol Channel, west coast of Ireland to Galway.—2. Yes; east coast of the United States, Bay of Fundy, the Sleeve, Cattegat, Baltic Sea, and Gulf of Finland.
- M. 319. THOMAS POWDITCH.—Shipowner, Wells, Norfolk.—May 23d, 1859.—Been at sea 42 years.—The "Whim," 65 tons, Wells.—1. The east coast.
- M. 320. H. B. HARVEY.—Master of "Express," No. 18, Western Terrace, Southampton.—May 23d, 1859.—I served five years apprenticeship in the foreign trade, &c.; 25 years in the home trade as man, mate, and master.—"Express," 111 tons, Southampton, 160 horse power.—1. Between Beachy Head and the Start.—2. Havre de Grace, Guernsey and Jersey.
- M. 321. JAMES CORMACK.—Deputy Harbour Master, Pottenbytown, Wick.—May 24th, 1859.—From 1822 to 1853 (as Master from 1827 to 1853).—"William McLeay," of Wick, 117 tons, "Favourite," of Wick, 76 tons, &c.—1. The east coast of the United Kingdom, from the Orkney Islands to London.—2. No, having never been foreign but twice; viz., two voyages to the Baltic, Russian coast.
- M. 322. SAMUEL MANLEY WEEKS.—6, Albion Street, Exmouth.—Three years apprentice, two years mate, 44 years master.—Retired.—1. Every part of United Kingdom, but not the colonies.—2. The Cattegat, Sound, Baltic, Gulf of Finland, and north side of Mediterranean, with Portugal and Spain.
- M. 323. THOMAS CANLERS.—Pilot Quay.—Yes; 30 years, boy, mate, and master.—Yes; "Penzance" Packet, 72 tons; "Guerilla," 24 tons; "Little Harry," 24 tons.—1. South Foreland to Bristol Channel, Scilly, and south coast of Ireland.—2. No.
- M. 324. W. B. WELLS.—Master in Pacific Steam Navigation Company's Service, 27, James Street, Liverpool.—I have been 22 years at sea, 15 of which in command.—Steamer "Lima," of Liverpool, of 1,165 tons register, and 320 nominal power.—1. Liverpool and Halifax, Nova Scotia.—2. The whole of Chili, Bolivia, Peru, Ecuador, and the Pacific Ports of New Granada.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

325. W. P. ROWE.—St. Mary's, Scilly Islands.—I have been at sea 20 years.—Not in command at present.—1. I have a slight acquaintance with most ports of the United Kingdom.—2. My chief experience has been in the Mediterranean, mostly the north coast. M.
326. WILLIAM MORTLEMAN.—Master Mariner, Folkstone.—May 25th, 1859.—28 years.—“Queen of the French,” 121 tons, London, horse power 120.—1. East coast of England, Straits of Dover, south channels, and Swin.—2. Coast of France, Havre, to Dunkirk. M.
327. JOHN BLAKE.—Master Mariner, Brixham, Devon.—May 19th, 1859.—18 years.—The “Lycurgus,” 141, Dartmouth.—1. The English, Irish, and Bristol Channels.—2. Most parts of the Mediterranean, South coasts of Spain, Sicily, and some parts of the coasts of Barbary. M.
328. ROBERT OLDMAN.—Owells, Norfolk, Master Mariner.—Have served at sea 25 years.—Nine years as Master of the “Sidney Claude, of Owells, 78 tons register.—1. East coast of England, and the Baltic. M.
329. TIM KELLY.—Superannuated Officer, Sea Park Villa, Salt Hill, Galway, Ireland.—May 24th, 1859.—I have for 50 years.—I have commanded Her Majesty's Revenue Cruiser, “Amphitrite,” up to April 1858.—1. The entire coast of Ireland, the west coast of Scotland, and the south coast of England as far as Portsmouth.—2. I am not acquainted, not having been foreign. R.N.
330. JOHN JONES.—Ship Broker, Saltney, Chester.—30 years.—“Hagar,” 122 tons, Chester.—1. From Orford Ness, English, St. George's, Bristol, and Irish Channels, south coast of Ireland, harbours south east as far as the Island of Isla. M.
331. Capt. GEORGE SIMPSON.—Grangemouth.—May 30th, 1859.—17 years.—No ship at present.—1. The English Channel, and the St. George's Channel, and the east coast of Scotland.—2. The Cape of Good Hope, Madras, Batavia, Singapore. M.
332. LUKE LOVE.—Master of the “Duke of Cornwall,” of Penzance.—Penzance, May 24th, 1859.—39 years, the last 26 Master of a trading vessel from London to Penzance.—“Duke of Cornwall,” 76 tons register, of Penzance, sailing vessel.—1. British Channel. M.
333. WILLIAM IRVINE.—Ship Master, Kirkwall.—32 years.—“Arva,” of Kirkwall, 79 tons register.—1. East coast Scotland. M.
334. WILLIAM MENARRY.—Master.—43, Fleet Street, Belfast.—June 1st, 1859.—31 years.—“Waterloo,” 324 tons, Belfast, horse power 240.—1. Between Belfast and Liverpool, and Belfast and Glasgow. M.
335. JAMES TREGARTHEN.—Shipowner, St. Mary's, Scilly (late a Master Mariner).—May 19th, 1859.—35 years.—1. St. George's and English Channel.—2. Mediterranean and Black Sea. M.
336. JOHN CLARK.—William Street, Liverpool; a Shipmaster, but at present unemployed, having just sold my vessel.—38 years.—I have been master of vessels since 1828, with the exception of a few voyages mate.—1. United Kingdom.—2. Baltic, North of France, Mediterranean, and North America. M.
337. WILLIAM WEAR.—Shipowner, Scarborough, agent to Lloyd's.—I was in the coasting trade about 20 years.—Not at present.—1. I am acquainted with the Yorkshire coast.—2. No. M.
338. EDWARD MURPHY.—Master Mariner, Mall Lane, Waterford.—22 years.—Brig “Thistle,” 265 tons; port of register, Waterford.—1. Gulf of St. Lawrence. M.
339. W. D. PRICE.—SURVEYOR to Lloyd's Register and Board of Trade, Waterford.—35 years.—1. London to Liverpool, and south and west coast of Ireland, and north coast of Scotland.—2. Cape Finisterre to Gibraltar, Carthagena, Brucearlo, Genoa, Leghorn, Naples, Sicily, Adriatic Archipelago to Black Sea. M.
340. JOSEPH WAITE.—Master Mariner, 40, Pilgrim Street, Birkenhead.—13 years.—“Dalemain,” 279, Liverpool.—1. St. George's Channel, English Channel, West Indies.—2. Coast of New Granada. M.
341. WM. RODD.—Master of the “Crimea.”—17 years.—“Crimea,” of Bideford, 519 tons. M.
342. ROBERT MONTGOMERIE.—Sagan Bank, Irvine, Ayrshire.—Liverpool, May 25th, 1859.—20 years.—“Lady Valiant,” of London, 725 tons.—1. I am acquainted with the coasts of the St. George and English Channels.—2. Coromandel coast, Malabar coast, in the Gulf of Manaar, &c. M.
343. Rd. S. MACHELL.—Master, East Bank, Oxtou, Birkenhead, Cheshire.—26 years.—“Factory Girl,” 463 tons, Liverpool.—1. St. George's Channel. M.
344. JOHN MILLIGAN.—Ship Master, “Perpetua,” Salthouse Dock, Liverpool.—May 21st, 1859.—20 years, 9 foreign, 11 coasting.—“Perpetua,” 396, Dumfries.—1. None in particular.—2. Ditto. M.
345. JOHN RYAN.—Master, ship “Manchester,” 81, Seacombe Street, Everton.—19 years.—Ship “Manchester,” 824 tons, Cork.—1. Cork, Liverpool, and Cardiff.—2. West Coast, South America. M.
346. ROBERT BAXTER.—Master Mariner, St. John, N.B.—17 years.—“Ann Gray,” 1,005, St. John, N.B.—1. St. John, N.B.—2. None. M.
347. HERBERT R. CROSS.—Master of Steamer “Courier,” 42, John's Hill, Waterford.—May 26th, 1859.—17 years.—Steamer “Courier,” of London, 374 tons, 150 h. p., running between Milford Haven and Waterford.—1. The coasts of the English and St. George's Channel, south-east coast of Ireland, the coasts of New South Wales, Victoria, Van Diemen's Land, and other parts of Australia.—2. Never remained sufficiently long on foreign stations to become intimately acquainted with their coasts. I may name, however, west coast of South America, Malabar coast, south coast of Arabia, &c. M.
348. WILLIAM DEANS.—Master Mariner, 20, Barclay Street, Monkwearmouth, Sunderland.—35 years.—None.—1. The English and St. George's Channels, the east coasts of England and Scotland, and west coast of Scotland, the coasts of British India and Australia.—2. Coasts of Cuba, the north side of Porto Rico and St. Domingo, Crooked Island Passage; France, from Cape Grisnez to Finisterre. M.
349. RICHD. ROBERTS.—Commander, India Mail Service between Alexandria and Marseilles.—22 years.—Peninsular and Oriental Company's steamer “Nepaul,” 1,400 tons, and 200 horse power, London.—1. Tolerably well acquainted with English coast from Land's End to the Downs.—2. Well acquainted with coasts of the Mediterranean, also with the coasts of Spain from Cape Finisterre to Sound, and Portugal. M.
350. JOHN WILSON.—At present Master, Steam Ship “Labuan,” 49, Coltman Street, Hull.—32 years, nearly 23 as Master.—Steam Ship “Labuan,” 400 tons, Hull; two engines of 40 horse.—1. I am acquainted with the coast from the Humber to the Downs.—2. I am acquainted with the Gulf of Finland. M.
351. GEORGE PEACOCK.—Retired Captain of the Mercantile Marine, Starcross, near Exeter, and for nearly 12 years a master and second master in the Royal Navy.—May 30th, 1859.—41 years.—1. Yes; British and Irish Channels, coast line on both sides, also the north-east coast of England; the Canadas, Nova Scotia, Gibraltar, Malta, also the British Colonies in the West Indies.—2. Yes; the Mediterranean coast line throughout, from Cape Spartel by Egypt, Syria, the Archipelago, Greece, and the Adriatic; coasts of Italy, Sardinia, France, Spain, and Portugal; also the United States Mexico, Central America, and South America from Chagries by the Straits of Magellan to Panama. R.N.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 352. THEODORE JULIUS.—Master of ship "Tonawanda," Liverpool.—35 years.—Ship "Tonawanda," 1240 delphia, U.S.—1. North and south coast of Ireland, and St. George's Channel.—1. Entrance to the Delaware, U.S., &c.
- M. 353. PH. FARLEY.—Master.—28 years.—"Geo. Kendall," 897.—1. St. George's Channel.
- M. 354. ARCHIBALD STEVENSON.—23 years.—"Matilda," of Quebec, 1,035.—2. I am well acquainted with the St. George's and the North channels.—2. No.
- M. 355. M. B. CROWELL.—Master of ship "Herald," on board ship.—19 years at sea.—Ship "Herald," 679 tons, Bath Maine.—1. Yes; south coast of Ireland, and coast of Wales.—2. Yes; coast of United States, shores of Mediterranean.
- M. 356. JAMES SHELFORD.—Master, "Miles Barton," Bryn Llyud, Anglesea, Wales.—20 years.—"Miles Barton," 933, Liverpool.—1. Yes; Irish and St. George's Channels.—2. Bay of Bengal, to Bombay and the Persian Gulf, and the coast of Brazil.
- M. 357. JACOB DIXON HARRINGTON.—No. 2, Mariner's View.—30 years.—"Teresa," 139 register, Whitehaven.
- M. 358. JAMES LEETHAM.—Master Mariner, Goole.—Goole, May 26th, 1859.—20 years.—"Norfolk" Steamer, 147 tons, of Yarmouth, 120 horse power.—1. The east coast of England and channel, and west coast of Ireland.—2. From Ushant eastwards to Belgium, Dutch, Hanover, Danish, Norwegian, Swedish, and Baltic coast, and Gulf of Finland.
- M. 359. G. ORANGE.—Merebant and Shipowner.—Jersey, May 27th, 1859.—20 years, the last ten as port owner.—1. I am acquainted with the George's and English Channels, south coast of Ireland, and east coast of England, Newfoundland, Lower Canada, Mauritius, St. Helena, Ascension, &c.—2. Brazils, River Plate, Mediterranean, Black Sea, west coast of Africa, Azores, Canary and Cape de Verde Islands, &c.
- M. 360. JOHN DUN.—Haven Master, Port of Bristol.—Haven Master's Office, Shirehampton, Port of Bristol, May 27th, 1859.—29 years.—Not now in command.—1. Intimately with the Bristol Channel.—2. I am not.
- S. 361. WILLIAM GRAHAM.—Surveyor of Hatches, Stowage, &c., 10, Earl Street, Belfast.—Belfast, Ireland, May 28th, 1859.—Four years apprentice, two years as mate, and 17 years as master in the foreign trade.—None at present.—1. I am well acquainted with the St. George's Channel, also round Ireland.—2. Am well acquainted with the coasts of Guano, West Indies, coasts of Brazil, and Mediterranean, also a part of the coast of America, Bay of Fundy to Florida.
- M. 362. WILLIAM WRIGHT.—Harbour Master, Ballina.—May 24th, 1859.—35 years.—"Henry and Jane," 105 tons, Ipswich.
- M. 363. CHAS. PARKER.—Manchester Street, Exmouth, Devon.—44 years, and have been Master for 30 years.—Retired.—1. Well acquainted from Newcastle to the Bristol Channel; colonies not acquainted with.—2. French and Dutch coasts well acquainted with.
- M. 364. WILLIAM W. HARVEY.—Master, Newhaven, Sussex.—Newhaven, Sussex, May 26th, 1859.—Been at sea 27 years.—Steam Ship "Orleans," of London, gross tonnage 269, 160 nominal horse power.—1. Well acquainted with coast from South Foreland to Land's End. General knowledge of coast of Ireland from Cape Clear, and St. George's Channel to Liverpool, the Bahamas, West Indies.—2. The French coast, from Dieppe to Cape La Hague, the Mediterranean and Black Seas, coast of Norway and Baltic.
- M. 365. ROBT. STAVELEY.—Commander Steam Ship "Nimrod," 7, Polygon, Clifton, Bristol.—25 years.—"Nimrod," Steam Ship, 351 tons, Cork, 350 horse power.—1. Yes; the English, St. George's, North, and Bristol Channels.—2. I am well acquainted with the northern French coast, and the coast of Portugal.
366. ALEX. CLACHAR.—Shipowner, Girvan.—About 20 or 22 years.—Have not sailed for the last 10 years, but own four vessels, "Agnes," register 38 tons; "Elizabeth," register 52 tons; "Agnes Kelly," 73 tons; "Elgin," 137 tons.—1. My acquaintance with the coast extends to Liverpool, Dublin, &c. on the one hand, and to the Isle of Skye on the other.—2. No.
367. HENRY C. BUSSELL.—Innholder, West Quay, Bridgewater.—Bridgewater, May 26th, 1859.—16 years; have retired for the last seven years.—1. English, Bristol, and St. George's Channels, and the east coast.—2. No.
- M. 368. P. B. SPRAY.—Schooner "Billow," of Hayle.—May 27th, 1859.—30 years.—"Billow," 113 tons, of St. Ives.—1. I am well acquainted with the North and Bristol Channels.—2. No.
369. THOMAS LIDDLE.—No. 31, Saville Street, S. Shields; no occupation at present.—About 17 years.—"Wentworth Beaumont," 255 N. M., Port of Newcastle.—1. I am acquainted on the north-east coast of England, likewise the English Channel and St. George's Channel.—2. From Gibraltar up to Constantinople I am acquainted, likewise the Black Sea.
- M. 370. JOHN D. HASWELL.—Stranraer.—May 26th, 1859.—For 35 years.—I have commanded in the Glasgow and Stranraer Steam Packet Company the last 22 years; the last has been the "Albion" Steamer, which is 156 tons, and 149 horse power.—1. The United Kingdom.—2. Not acquainted.
- M. 371. WILLIAM SPRAY.—Queen Street, Hayle.—May 27th, 1859.—34 years.—"Queen," Steamer, 160 horse power, port of registry, St. Ives.—1. I am well acquainted with the Bristol Channel.—2. No.
- M. 372. HENRY STRANECK.—Master Mariner, 31, Parcain Row, Rotherithe, London.—May 28th, 1859.—About 18 years.—"Concordia," London, S., 326 tons, 120 horse power.—1. River Thames and east coast of England.—1. Dutch coast, northern coast of France.
373. JOHN GREY.—Inspector to Local Insurance Clubs, 14, Eden Street, Sunderland.—About 25 years; but much at sea previously.
- C.E. 374. THOMAS MEIK.—Civil Engineer.—1. From 14 years residence at Sunderland as Engineer to the River Wear Commission, I am well acquainted with the north-east coast of England, from Scarborough to the Firth of Forth.—2. I am not.
- M. 375. NICHOLAS REYNOLDS.—Master, Wellington Road, Cork.—22 years.—"Reward," 119 tons, Cork.—1. Coast of Ireland, Bristol Channel, English and St. George's Channel.—2. Coast of Spain and Portugal.
- M. 376. ROBERT ANDERSON.—Master of the "Josephine," Newburgh, Fife.—May 30th, 1859.—34 years.—"Josephine," 84 tons register, port of Perth.—1. Well acquainted with all the ports of Britain.—2. All the coast of France, and the Holland coast, and the Baltic Seas.
- M. 377. LEONARD WATSON.—Lloyd's Agent, Warren Point, Ireland.—May 31st, 1859.—From 1804 to 1822; 13 years in command, generally West India trade; retired from sea 1822.—Several.—1. Liverpool.—2. West Indies generally, and North America.
- M. 378. THOMAS SHUGG.—Hayle, Cornwall.—May 28th, 1859.—24 years.—"Cornwall," of St. Ives, not yet measured.—1. Bristol Channel.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

379. JOSEPH GREEN.—“Prima Donna,” Penzance.—45 years.—“Prima Donna,” 95 tons, Penzance, Sailing Vessel.—1. Bristol and St. George’s Channel, and English Channel.—2. Not well acquainted. M.
380. PHILIP JONES.—Schooner “Ann,” of Penzance.—44 years.—“Ann,” 53 tons, of Penzance, Sailing Vessel.—1. St. George’s, English, and Bristol Channel.—2. South coast of France, Mediterranean, and America. M.
381. WILLIAM ANSELL.—Master, 10, Woolmore Street, Poplar, London.—May 28th, 1859.—40 years.—“Phoenix,” Yacht, 70 tons, London.—1. South and west coast of England.—2. Part of the north coast of France. M.
382. GEORGE BAWDEN.—Schooner “Venus,” of Penzance.—42 years.—“Venus,” 99 tons, of Penzance, Sailing Vessel.—1. St. George’s, Bristol, and English Channel.—2. Pretty well acquainted with the Mediterranean. M.
383. WILLIAM CAMPBELL.—Master of the Steam Ship “City of London,” No. 8, Millburn Street, Aberdeen.—27 years.—“City of London,” 1,116 tons, Aberdeen, 420 horse power.—1. From London to the Orkney and Shetland Islands, including the Firth of Forth, and Moray Firth.—2. Mediterranean. M.
384. WILLIAM B. LESLIE.—Courtmarsherry.—1 am a yacht owner for more than 20 years; my vessel is the Cutter Yacht “Psyche,” R.C.Y.C., 28 tons, at Courtmarsherry, a port of Cork.—1. I know the south coast of Ireland well from Youghal to Bolus Head.—2. I am not. Y.
385. GEORGE FOWLER.—Master of the “Leopard,” Screw Steamer, Hull.—May 29th, 1859.—24 years.—“Leopard,” 500 tons, 150 horse power.—1. East coast of England.—2. Russia, Prussia, Sweden, Norway, Denmark, Holland, and north part of France. M.
386. JOHN DOUGLAS.—Ship Broker, No. 8, Caroline Street, Cardiff, South Wales.—Cardiff, May 31st, 1859.—30 years.—Employed at present on shore.—1. I have circumnavigated the coasts of Great Britain and Ireland frequently.—2. White Sea and Baltic Sea, North and South America on the east and west coasts; China, Signapore, Moulmain, Mediterranean Sea. M.
387. H. SOULSBY.—Master of the “Pacha,” in the Hull and Hamburg Trade, No. 26, Caughy Street, Hull.—19 years.—Screw Steamer “Pacha,” 284 tons, port of register, Hull, 60 horse power.—1. East coast from Flamborough Head to Yarmouth Roads.—2. Coasts of Belgium, Elbe, Baltic, and Gulf of Finland. M.
388. JOHN WHARTON.—Steam Ship “Eugenie,” Anglo-French Steam Ship Company, Grimsby, or, 8, Neville Street, Hull.—May 30th, 1859.—34 or 35 years.—Steam Ship “Eugenie,” 302 tons, Grimsby, 80 horse power.—1. I am licensed to pilot from Hull to the Downs, the Nore, and the Elbe.—2. Am slightly acquainted with Dunkirk, Scheld, Cattagat, Baltic Sea, Gulf of Finland. M.
389. GEORGE BURTON THOMAS.—Castle Square, Carnarvon.—May 28th, 1859.—17 years.—“Caradoc,” 237, Beaumaris.—1. St. George’s Channel, English Channel, and east coast to the Tyne. M.
390. ROBERT DENT.—12, Old Broad Street, City, London.—31 years; 22 years as master.—“Conflict,” 1,326, Liverpool.—1. St. George’s and English Channels, the latter particularly.—2. I am acquainted with a large portion of the coasts of Europe, including Mediterranean and Baltic. M.
391. B. JOHNSTON.—Master, on board, in Dundalk or Liverpool.—June 2d, 1859.—35 years.—“Enterprise,” 445, Dundalk, Steamer, 320.—1. Liverpool and east coast of Ireland.—2. I am not particularly. M.
392. GEORGE HENRY WAKELEY.—St. Mary’s Street.—22 years.—“Eliza,” No. 24, Cowes, register 24.—1. Yes, from the Owers east to the Start westward, and into and out of the Port of Cowes.—2. No. M.
393. WILLIAM DAVIS.—Master of the after-named ship, Bristol, General Steam Navigation Company.—26 years.—Steam Ship “Shamrock,” of Bristol, 250 horse power.—1. Bristol, St. George’s and English Channels.—2. Have been foreign, but not taken particular notice. M.
394. Captain JOHN DAVIES.—Master of Dandy “Edward and James,” Crane Street, Chester.—14 years.—The Dandy “Edward and James,” and have been Master of a screw boat between Liverpool and London.—1. St. George’s Channel from the Smalls to Londonderry and the Clyde, Bristol, and English Channel to London.—1. The coast of France, from Havre to Calais. M.
395. HENRY GREGG.—Ship Master, Dublin.—May 25th, 1859.—12 years.—“Columbus,” 939 tons, of Dublin.—1. East coast of Ireland, west coast of England, and west coast of Scotland.—2. Gulf of St. Lawrence, coast of Brazil, Gulf of Mexico, and a general knowledge of Mediterranean. M.
396. GEORGE BAKER.—North Sea and Channel Pilot, 202, Middle Street, Deal.—30 years.—No.—1. I well know the coast from Plymouth to Scotland.—2. Yes, France, Holland, in fact the whole coast to Denmark. P.
397. GEORGE McNEILLY.—Master Mariner, 17, Stephen Street, Sligo.—May 25th, 1859.—19 years.—1. Yes, west of Ireland, St. George’s Channel, Irish Sea and North Channel, Newfoundland, St. Lawrence, coast of North America.—2. Yes, Spain and Portugal, and North America. M.
398. WILLIAM McKEON.—Master Mariner, 21, Oriel Street, Dublin.—May 27th, 1859.—Yes, 16 years.—1. South coast of Ireland.—2. Spain and Portugal, and North America. M.
399. GEORGE TROTT.—Channel, North Sea, Pilot, 79, Beach Street, Deal.—25 years.—No, piloting is my occupation; any parts of England, Scotland, Holland, Bremen, &c.—1. From the Land’s End to Scotland.—2. From Cherbourg to the Brill, including Naulocian, in fact the whole coast. P.
400. JOHN DONOHUE.—Ship Master, Cappa, Kilrush, County Clare.—May 24th, 1859.—19 years.—Late Master of “Lochibe,” but not when she was lost, 1,006 tons, of Dublin.—1. Straits of Bellisle, Gulf of St. Lawrence, Bay of Fundy, and coast between English Channel, St. George’s Channel, west coast of Ireland, and the Clyde.—2. The coast of the United States of America, from Portland to New Orleans, and the French coast in the vicinity of Havre de Grace. M.
401. ROBT. FITZROY.—Reserved Rear Admiral, Board of Trade, 2, Parliament Street, London, S.W.—40 years nominally, 20 actually afloat in sea service.—1. The coasts of the United Kingdom generally, and those of the Australian colonies, Cape, Mauritius, &c.—2. France, Portugal, Spain, South America, from the Equator southward, on both sides (including the Falklands), Polynesia, Australia, South Africa, parts of the Mediterranean, and various islands. M.
402. ALEXANDER MACKEY.—Master Mariner, No. 45, Smith Street, Kirkdale.—28 years.—“War Cloud,” of Liverpool, 1,131 tons.—1. General acquaintance with the English and Irish Channels.—2. None in particular. M.
403. EDWARD LAMB.—7, Blackburn Street.—13 years.—“Eliza Hands,” 264, Liverpool.—1. South-west coast of Ireland, and coast of Irish Sea.—South-east coast of America. M.
404. WILLIAM HENRY MOORE.—Master, 19, Duke Street.—18 years.—No ship at present.—1. Not particularly.—2. No part in particular. M.
405. WALTER McLAREN.—Mariner, Kincardine, Perthshire.—Liverpool, May 13th, 1859.—30 years.—“Bannockburn,” 730 tons, Greenock.—1. All round the United Kingdom, and Gulf of St. Lawrence.—2. Mediterranean, and Gulf of Finland. M.
406. JAMES R. SCOTT.—Master Mariner, Park Street, Liverpool.—25 years.—“Parana,” Liverpool, 296 tons register.—1. Tolerably well acquainted with the English and St. George’s Channel.—2. None particularly. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 407. WILLIAM QUINE.—Master Mariner, 3, Orrell View, near Liverpool.—15 years.—Ship “Lady Ebrington,” 413 tons, of Liverpool.—1. Yes, the Great George’s Channel.—2. Yes, the West Indies and west coast of America.
- M. 408. MATTHEW FLYNN.—Master, James Baines and Co., Liverpool.—24 years.—“Saldanha,” 1,563, Liverpool.—1. English and St. George’s Channels.—2. Gulf of St. Lawrence, South Australia and Demerara.
- F.M. 409. D. T. DE JONGE.—King’s Dock, Liverpool.—18 years.—“Tantze Meyer,” 162 tons, Wildervank.—1. English Channel.—2. At the coast of Netherland.
- F.M. 410. FRAOLI PETERSON WOLSGOORD.—Master Mariner, 16, South Castle Street, Liverpool.—May 16th, 1859.—61 at sea; 45 years master.—Danish Schooner “Bjarke,” 144 tons, of Saxe-Coburg, Denmark.—1. Bristol and North Channel.—2. Spain, Portugal, Norway, Denmark, Sweden, Finland, Prussia, and Russia.
- M. 411. C. A. BELVEA.—Master of Ship “Kelvin,” Miller and Mossman, Agents.—I have served at sea 20 years.—“Kelvin,” 776 tons, St. John, N. B.—1. I am well acquainted with the Irish coast and St. George’s Channel, also particularly well acquainted with the Bay of Fundy and Nova Scotia, and North Brunswick coast.—2. I am well acquainted with the coast of United States from Gulf of Mexico to British provinces.
- F.M. 412. G. M. DEBER.—Address Herr L. Larsen, Kragero, Norway.—10 ar.—Brig “Veranaa,” 159 register tons.
- M. 413. THOMAS DUNN.—Chartered to bring coals to Malta, 33, South Chester Street, Liverpool.—May 19th, 1859.—17 years.—“Ganges,” 675, Dublin.—1. St. George’s Channel.—2. The Gulfs of Mexico, and Florida, and St. Lawrence.
- M. 414. WILLIAM WHITE.—S. R. Graves, Esq., Redcross Street, Liverpool.—24 years, from Liverpool.—“Argonaut,” 1,237 tons.—1. East coast of Ireland; Colonies moderately.—2. None.
- M. 415. J. W. STEELE.—Ship Master, 8, Clarence Street, Liverpool.—15 years.—“Sultan,” of Liverpool, 848 tons.—1. I am sufficiently well acquainted with the English and St. George’s Channels to navigate vessels up and down, but have only a general knowledge of the coast, as I have been in the foreign trade.—2. I am not, having rarely been more than twice to the same place.
- M. 416. DAVID FRASER.—Master Mariner, 21, Bridgewater Street.—24 years.—Barque “Orient,” 370, Liverpool.—1. South Africa, English Channel, and east coast.—2. Partly with China Sea.
- M. 417. JOHN BROWN.—16, Nile Street, Liverpool.—34 years.—Barque “Illimaine,” 409 tons, Liverpool.—1. St. George’s Channel, West India Islands.—2. West coast of America, Chili and Peru.
- M. 418. JOHN HERBERT.—Master, King’s Dock.—25 years.—Barque “Isis,” 298, Maryport.—1. St. George’s Channel.—2. West Indies.
- M. 419. CHARLES FOSKEY.—2, Queen Street, Dundee.—17 years.—“Eleanor Thompson,” 241 tons, Whitehaven.
- M. 420. T. B. LACY.—Master, 58, Park Road, Liverpool.—Since 1824.—“J. W. Johnson,” of Liverpool, 118 tons.—1. From London northwards.—2. From Gibraltar upwards to Taganrog, also the Baltic.
- M. 421. C. C. YORK.—Master of the Danish Bark named “Danman,” Liverpool.—May 17th, 1859.—I am quite satisfied with all the lights and buoys, &c., &c.
- F.M. 422. R. NORTON.—Master.—30 years.—Ship “Monterey,” 598 tons, of Susannah, Georgia, United States.—1. Some acquaintance from the Sultere Lights to Liverpool.—2. Yes, from Boston to Susannah, United States.
- M. 423. Have been actively employed these 38 years as master or commander, always in the foreign trade.—41 years.—Ship “Czar,” of Greenock.—1. I am acquainted with the English Channel, particularly St. George’s and Irish Channels, and North Channel, also South Australia.—2. The United States of America.
- F.M. 424. MOSES H. SAWYER.—16 years.—Ship “Evelyn,” 1,197 tons, New York.—1. I am acquainted with the south and west coasts of England and Wales, and the east and south coasts of Ireland.—2. I am acquainted with the north and some of the west coasts of France, east coasts of the United States, and West Indies.
- M. 425. WILLIAM CHAMBERS.—Holms, Croft Street, Greenock.—30 years.—Ship “Inkerman,” 790 tons, Greenock.—1. Irish and English Channels.—2. Australia and West Indies.
- M. 426. J. T. HOSMEY.—I cannot suggest any improvement in St. George’s Channel as far as lights go.
- F.M. 427. DANIEL HENRY TRUMAN.—Commanding Ship “Calhoun,” of New York, at present in the Bramley Moor Dock, Liverpool.—May 18th, 1859.—36 years.—Ship “Calhoun,” of New York, present British measurement 1,825 tons.—1. St. George’s Channel.—2. A part of the United States.
- M. 428. JOHN COULTER.—Master Mariner, 57, South Chester Street, Liverpool.—19 years.—“Kerth,” 1,060, Liverpool.—1. Well acquainted with St. George’s Channel, and south coast of Ireland.—2. The American coast from Cape Hatteras to Cape Canso, Nova Scotia.
- M. 429. THOMAS DUFF.—Master, 14, Harbord Street, Edge Hill.—16 years.—Ship “William Melhuish,” 707 tons, Liverpool.—1. Yes, St. George’s Channel.—2. Pretty well acquainted in Black Sea, Mediterranean Sea, and Bay of Bengal.
- M. 430. WILLIAM STONE.—Master Mariner, No. 18, Egerton Street, Park Road, Liverpool.—29 years.—“Mans,” 357 tons, Liverpool.—1. Bristol Channel, Gulf of Guinea, Africa.
- F.M. 431. DAVID BROWN.—Ship “William Lord,” from the United States of America.—30 years.—1. Yes.—2. Coast of America, North and South.
- M. 432. JAMES SMITH.—Overlooker to Stitt, Courbragh, and Co.—25 years master of sailing vessels.—Have not been at sea for 5 years.—1. St. George’s Channel, Clyde, and Gulf of St. Lawrence.—2. Only general knowledge.
- M. 433. JOHN CARRINGTON.—Master Mariner, 114, Upper Warwick Street, Liverpool.—24 years.—“Arabian,” 404, Liverpool.—1. George’s and Irish Channels.—2. West coast of Africa.
- M. 434. W. C. O’BRIEN.—8, Clifton Crescent, Birkenhead.—12 years.—“Fort William,” 765 tons, Liverpool.—1. Yes; with the north-west coast of Ireland.—2. Yes; Bay of Bengal, and Gulf of St. Lawrence.
- M. 435. ALFRED WELCH.—Schooner “Swallow,”—17 years.—“Swallow,” 149, Portsmouth.—1. Not particularly.
- M. 436. FRED. B. HIRE.—142, Brownlow Hill, Liverpool.—27 years.—“Cannate,” 514 tons, Liverpool.—1. No.—2. No.
- M. 437. JOHN ABERNETHY.—60, Toxteth Street, Liverpool.—16 years.—“George Dean,” 182 tons, Liverpool.—1. From Scilly to London, from Cape Clear to Liverpool.—2. Coast of Africa, Mediterranean, and Mexico.
- M. 438. GORDON GOULD.—Master, “Melicete,” 67, Upper Lisle Street, Liverpool.—23 years.—Ship “Melicete,” 1,152 tons, Liverpool.—1. St. George’s Channel.—2. Hoogley.
- M. 439. JOHN SIMMIN.—10, St. Paul’s Square, Liverpool.—30 years.—“Julia Heyns,” 337, Belfast.—1. St. George’s Channel.—France.
- M. 440. ANDW. ALLAN.—Commander, ship “Wm. Fairbairn,” 52, Clevedon Street, Liverpool.—44 years.—“Wm. Fairbairn,” 1,293 tons, Liverpool.—1. Coast of Ireland, from Cape Clear to Wicklow Head, and Bass’s Straits.—2. Dutch Guiana, from the River Marawine to the River Comantine.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

441. F. G. JEAN.—Brig "Vivid," King's Dock, Liverpool.—29 years.—"Vivid" Brig, 197 tons, of Jersey.—1. United Kingdom and North American Colonies.—2. Gulf of St. Lawrence. M.
442. JAMES BRUCE.—Master of the "Anglesea."—About 17 years.—"Anglesea," 913 tons, of Glasgow.—1. St. George's Channel and North Channel, Gulf of St. Lawrence in colonies.—2. Not particularly. M.
443. J. S. WALLIS.—Master of the "Linda," Messrs. Viney, Killey, and Co., Chapel Street, Liverpool.—18 years.—"Linda," 344 tons, of Liverpool.—1. St. George's Channel.—2. Brazilian and west coast of America. M.
444. WILLIAM LANGCAKE.—Master, 37, Church Street, Woodside, Cheshire.—18 years.—"James Carthy," 277 tons, Liverpool.—1. St. George's Channel.—2. The Coast of Brazils, and the River Plate. M.
445. ROBERT GORDON.—Master Mariner, "Coniston," King's Dock, Liverpool.—16 years.—Sailing Barque "Coniston," 203, Liverpool.—1. South-east of Africa, St. George's Channel.—2. No. M.
446. SAMUEL RADDOCK.—24, Castle Street, Liverpool.—31 years.—"Rajmahal," 1,301, Liverpool.—1. Yes; St. George's Channel.—2. Yes; the Bay of Bengal, Coast of Brazils, from St. Roque to Cape Frio. M.
447. WILLIAM BOWMAN BOWMAN.—Master Mariner, No. 2, Huskisson Street, Liverpool.—10 years.—"Dumuil," Workington, 771 tons register.—2. Coasts of China and Coromandel. M.
448. JAMES KIDDIE.—Australian trade.—22 years.—"Commodore Perry," tonnage 2,017, port of register, Liverpool.—1. Irish Channel, Liverpool Bay, English Channel, south coast of Australia. M.
449. R. B. GOODWIN.—Master, No. 3, Finwick Street, Liverpool.—22 years.—"Isis," 325 tons, London, sailing.—1. East coast of England.—2. Mediterranean and Baltic. M.
450. THOS. SOPWITH.—Captain of the ship "Kitty Cordes," of Liverpool; 39, Toxteth Street, Park Road.—Seven years in coasting and Mediterranean trade.—Ship "Kitty Cordes," Liverpool, 849 tons.—1. English and St. George's Channels.—2. Coast of Coromandel, &c. M.
451. WILLIAM BURTON.—Master, No. 24, Windsor Street, Liverpool.—30 years.—"Mina," 186, Liverpool.—1. St. George's Channel, and all the coast of North America.—2. Ceylon, Valparaiso, West India Islands. M.
452. WM. CHARLES.—Master of the "Julia," of Llanelly.—25 years: first, "Alexander," 72, Llanelly; second, "Julia," 119, Llanelly.—1. Three channels.—2. Yes, from Elbe to Brest. M.
453. F. T. HAYE.—Captain, Liverpool.—May 17th, 1859.—"Oldenburg" Brig.—1. No. M.
454. FREDERICK WM. MACR.—No. 6, Ebenezer Place, Weymouth, Dorset.—34 years as apprentice, seaman, mate, and master.—"Polka," 151 tons register, Newcastle.—1. North-east coast, from the Tyne to the Downs, from thence to the Lizard in the English Channel.—2. South of Spain and Baltic. M.
455. HUGH MCPHERSON.—Ship "Relief," Liverpool.—19 years.—Ship "Relief," 719, Liverpool.—1. No particular coast. M.
456. JOSEPH WOOD.—Dock Master.—Five years.—Second Officer for four years in the "Active," South Sea whale ship, of London.—1. North coast of Scotland, Irish Channel, and the English Channel. M.
457. W. RANDALL.—5, Washington Street, Master of the "Morning Star," Liverpool.—15 years.—"Morning Star," 1,327, Liverpool.—1. Three Channels; Australia.—2. No. M.
458. C. J. SCHLOR.—"Windsbrant," 299, of Stralsund, in Prussia.—35 years.—1. East coast of England and Scotland, and west coast of same.—2. Prussian coasts. F.M.
459. JAMES DUNLOP.—251, Bedford Street.—18 years.—"Ida," 1,157 tons, Liverpool.—1 and 2. Not any one part more than another. M.
460. JOHN PRICE.—Master of Brig "Premier," of Dover, 21, Union Row, Military Road, Dover, Kent.—33 years.—Brig "Premier," of Dover, tonnage per register, 175.—1. I have seen all parts of the coast of the United Kingdom.—2. France and Holland. M.
461. WILLIAM MAIN.—Master Mariner, 17, Parliament Place, Liverpool.—23 years.—"Ellen," 440 tons, of Liverpool, sailing vessel.—1. Irish and St. George's Channels.—2. West coast of South America, from Cape Horn to Syrique. M.
462. H. S. JOSEPHSON.—Commercial Hotel, Canning Place, Liverpool.—20 years.—Barque "Richard Cobden," 461 tons, of Liverpool.—1. Tolerably acquainted with the English and Irish Channels. M.
463. HENRY KNIGHT.—Ship Master, Barque "Saugeen," Liverpool.—28 years.—"Saugeen," of Padstow, 481 tons.—1. English, Bristol, and St. George's Channels.—2. From Cape St. Vincent to Malta. M.
464. RUDOLPH PANITZSE.—Fährer der "Friedrich Wilhelm III.," uns Danzig.—11 Jahr.—"Friedrich Wilhelm III.," 450 tons, von Danzig. F.M.
465. HENRY BURNS.—Master of Steamer "Despatch."—35 years.—"Despatch" Steamer, 427 tons, 120 horse power.—1. St. George's Channel.—2. Mediterranean, and coast of France. M.
466. JAMES MCNAIR.—Master, Ship "Annawan," Messrs. Wakeman, Dimon, and Co., New York.—Since 1830.—Ship "Annawan," of New York, 759 tons.—1. I am acquainted with the Great Bahama Bank, Providence, North-west Channel, and Gulf of Florida.—2. I am well acquainted with the coast of the United States from New York to Savannah. F.M.
467. MENDAL CROCKER.—Ship Master, London Dock.—40 years.—"Protector," New York, 1,267 tons.—1. All.—2. United States, Chili, Peru, Spain, China, &c. M.
468. GEORGE DOWELL.—Master, 66, Wapping Wall, London.—33 years.—"Auguste," of Cowes, 418 tons, Sailing Barque.—1. East coast of England, Baltic, and Mediterranean.—2. No. M.
469. S. TREGONING.—Master, 29, Netherfield Ward North, Everton, Liverpool.—22½ years.—Ship "Margaret Deane," of Liverpool, 430 tons.—1. West and north coast of England, east coast of Ireland.—2. French coast, Dutch, East Indies, China, South America, &c., east and west sides of it. M.
470. W. H. MARTIN.—Master, 47, Nile Street, Sunderland, Durham.—43 years.—Ship "Clarendon," 656 tons, Sunderland Sailing Ship.—1. England, Ireland, and Scotland.—2. Holland, Spain, Portugal, France, north and south, Carribean Sea. M.
471. RICHARD PALFREY.—Master Mariner, W. and H. Thomas and Co., 2, New Hall, Liverpool.—25 years.—"Apollo," St. John's, Newfoundland, 133 tons.—1. English Channel, St. George's Channel, Newfoundland, and West Indies.—2. Brazils, Portugal. M.
472. WILLIAM JOHNSTON.—169, Grafton Street, Liverpool.—20 years.—Ship "Challenger," 816 tons.—1. St. George's Channel, English Channel, North Channel.—2. Chili and Peru. M.
473. JOHN HARCUS.—Master, 89, Stephenson Street, near Shields.—Been 28 years at sea.—"Byrantium," 304 tons, Shields.—1. North and east coasts of England and Scotland, English Channel, St. George's Channel partially, Gulf of St. Lawrence, and parts of West India Islands.—2. North side of the Mediterranean. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 474. WILLIAM BISHOP.—Master of the Steam Ship "Lady Eglinton," British and Irish Steam Packet Company, 46, Northwall, Dublin, or, Newtown, Mount Kennedy, County Wicklow.—Dublin, May 28th, 1859.—Since December 1810, and continuing feeling anxious to serve as many more years to the sea, and maintaining good health, thank God.—Steam Ship "Lady Eglinton," 295 tons, Dublin, 150 horse power.—1. I am in the St. George's and in the English Channels, more particularly between Dublin and London.—2. Many of the ports in the West India Islands and Spanish and Main, the Bay of Mexico, and from thence north into all ports continuing as far as Montreal.
- M. 475. JAMES EDWARD FIELD.—Portswood Park, Haris.—June 3d, 1859.—30 years.—"Indus," Steamer, 450 horse power, 2,000 tons; "Haddington," Steamer, 450 horse power, 1,800 tons; "Hindostan," Steamer, 500 horse power, 2,000 tons; "Bentnick," Steamer, 500 horse power, 2,000 tons; "Pottinger," Steamer, 450 horse power, 1,800 tons; "Erin," Steamer, 300 horse power, 1,000 tons; "India," Steamer, 350 horse power, 1,200 tons; "Candia," Steamer, 500 horse power, 2,300 tons; "Colombo," Steamer, 500 horse power, 2,300 tons; "Behan," Steamer, 300 horse power, 1,800 tons; "Tagus," Steamer, 200 horse power, 800 tons; "Ara," Steamer, 450 horse power, 1,800 tons.—1. Yes, the south-west coast of England.—2. Yes, east coast of the Atlantic, Mediterranean, Red Sea, Arabian Sea, Indian Ocean, China, and Yellow Seas.
- M. 476. WILLIAM B. HALL.—Commander, Peninsular and Oriental Steam Ship "Tagus," Peninsular and Oriental Company's Office.—June 1st, 1859.—24 years.—"Tagus," 497, London, 280 horse power.—1. South coast of England from Start to Needles.—2. West coast of Spain and Portugal, from Cape Villano to Cape St. Vincent.
- M. 477. JAMES MANN.—Ship Master, Pulteney, Wick.—June 1st, 1859.—26 years.—None at present, out of situation through bad health.—1. East coast of England, Scotland, and Highlands.—2. Cattegat and Baltic.
- M. 478. WILLIAM PENFITT.—Bristol, Westbury.—June 2d, 1859.—21 years as master.—"Lord Beresford," Swansea, 60 horse power.—1. Bristol, St. George's, English, Channels, and coast of Ireland.
- M. 479. WILLIAM TONTON.—Captain of the "Dart," Steam Tug, Liquorpond Street, Boston.—26 years.—The "Watson," of Boston, 52 tons, Sailing Vessel.—1. Yes, east coast.—2. Lower continental ports.
- M. 480. EDWARD JOHNSTON.—Master Mariner, Newburgh, Fife.—18 years.—No.—1. East coast of England.—2. Baltic Sea.
- M. 481. EDWARD DEMPSEY.—Commander Steam Ship "Plynlynan," 6, West Derby Street, Liverpool.—Aberystwith May 23d, 1859.—39 years foreign and coastwise.—"Plynlynan," 141 tons, Liverpool, 50 horse power.—1. I am with the English Channel and the principal parts; viz., Penzance, Falmouth, Plymouth, Portsmouth, and the Downs to Gravesend; also the Irish Sea and approaches to Liverpool and Bristol Channel.—2. I am not.
- M. 482. WILLIAM WATTS.—Master Mariner, out of employ, East Street, Faversham, Kent.—June 3d, 1859.—10 years.—I have commanded several, from 60 to 170 tons register, coasting and foreign.—1. I have a general knowledge of the North and South Channels of the mouth of the Thames, the Downs, and across the Kent from Foreland to Orfordness, North Channel, Harwich Harbour, east coast of England and Scotland, Pentland Firth, south harbour of Orkney, North Sea, English Channel, Bristol Channel, up to Cardiff, south of Ireland, Irish Channel to the north as far as Holyhead.—2. I have several times passed up and down of the west coast of Portugal, south coast of Spain up to Denia, south coast of Sicily, Gibraltar, Malta, Corfu, and up and down the Archipelago to the Crimea, Alexandria, Simond's Bay, Cape of Good Hope, Persian Gulf, Isle of France, Pernambuco, Rio de Janeiro, Azores.
- M. 483. LEWIS BILTON.—Master Mariner, 7, Rumford Street, Liverpool.—31 years.—Ship "Queen of the East," 1,223 tons, Liverpool.—1. I am well acquainted with the coasts of Great Britain generally, and those also of India and Australia.—2. I am not.
- M. 484. JOHN HERRON.—Ship Master, 26, Upper Parliament Street, Liverpool.—24 years.—1. English, Bristol, St. George's, and North Channel.—2. United States, British America, West Indies, Peru, Portugal, and Spain.
- M. 485. BENJAMIN ASKEY.—No. 4, Chesterfield Street, Liverpool.—35 years.—1. English, St. George's, and Bristol Channels, west coast of Ireland, Gulf of St. Lawrence.—2. Baltic, Gulf of Finland, Mediterranean, America.
- M. 486. LUTHER J. BRIGGS.—Master, Ship "Empire State," Waterloo Dock, Liverpool.—32 years.—Ship "Empire State," 1,323 tons, of New York.—1. Yes, from Cape Clear to Liverpool.—2. Yes, United States of America.
- M. 487. THOMAS WILLIAMS.—Master of Ship "Glen Monarch," Criccieth, Camarvonshire, North Wales.—May 18th 1859.—I have been 21 years.—I command the Ship "Glen Monarch," of Liverpool, 973 tons register.—1. St. George's Channel and English Channel, British North America, and South Australia.—2. Peru, from Callao to Chincha Islands, United States, and about Cape Horn.
- M. 488. ROBERT MORELL.—Ship Master, 35, Hope Street, Liverpool.—17 years.—"Dakotah," of Bridgewater, 1,000 ton.—1. East coast of Ireland, coast of England, from Lizard to North Foreland.—2. Coast of Peru and Chili.
- M. 489. JOHN BARTLETT.—Barque "Fortuna," King's Dock, Liverpool.—As master in the foreign trade from 1836 to 1855.—"Fortuna," 416 tons, of Poole.—1. English Channel, St. George's Channel, south coast of Ireland, and New foundland.—2. From Callao to Cape Horn, thence to coast of Brazil, Gulf of Mexico, north-east and north-west coasts of Newfoundland, coast of Portugal, Spain, and Mediterranean, up to the Gulf of Venice, and North Sea to Hamburg.
- M. 490. RICHARD PENTECOST.—Liverpool, May 18th, 1859.—I have been following the sea for 39 years, and been master since 1832.—I command the Ship "Lady Sale," 736 tons, registered out of the port of Liverpool.—1. British St. George's, and Bristol Channels.—2. The North Sea and Baltic, west coast of America, West Indies, Gulf Mexico, Florida, and the Gulf and the River of St. Lawrence.
- M. 491. JAMES TURNER.—Master of Ship "Caleta Haws," No. 5, Church Street, South Park Road.—I have been at 35 years.—Ship "Caleta Hawes," 1,124 tons, St. John's, N. B.—1. I am well acquainted with St. George's and the North Channels, also the Gulf and River of St. Lawrence.—2. I am acquainted with the coasts of United States, Gulf of Mexico, and the Gulf of Florida.
- M. 492. DAVID JONES.—Master, Ship "Joseph Steel," Salthouse Dock, Liverpool.—Since 1831.—Ship "Livingston 476; Ship "Tinton," 480; Ship "Joseph Steel," 838, Liverpool.—1. Not particularly, except the British at St. George's Channels.—2. Yes, the Bay of Bengal, and China, and United States.
- M. 493. JACOB GILLIES.—Master, Ship "Morning Light,"—26 years.—Ship "Morning Light," 2,377 tons, of St. John's, N. B.—1. St. George's and North Channels, the coasts of Nova Scotia, and New Brunswick, Bay Fundy, &c.; Victoria in Australia, and Bombay in the East Indies.—2. Callao, as far south as Pisco in the United States, from the Mississippi to Eastport, State of Maine, including the harbours of Mobile and Savannah.
- M. 494. JOHN CHRISTOPHER.—Master Mariner, St. Ives, Cornwall.—I have been 16 years as mate and master in the foreign trade; 13 of which master.—I am master of the Schooner "Hornet," of St. Ives, in the Mediterranean trade.—1. Well acquainted in the English and Bristol Channels, and with the coast of British North America.—2. I know the coast of Spain, Portugal, and south coast of France well.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

495. HUGH ROSS.—11, Egerton Street, Liverpool, in command of the "Lord Raglan,"—22 years.—"Lord Raglan," Cork, 1,952 tons.—1. No.—2. I have had some experience on the coasts of Chili and Peru, but I question if sufficient to justify me in saying I well acquainted with them; I have been eight different voyages to those coasts. M.
496. C. W. MILLIKEN.—Ship Master, care of Messrs. Boulton, English, and Brandon, Liverpool.—18 years.—Ship "Caroline Nesmith," 870, of New York.—1. I am not.—2. Coast of United States, Mexico, West Indies, Mediterranean Sea, &c. M.
497. E. A. HUSSEY.—Master, Ship "Escort," care of Alexander Taylor and Co., Liverpool, or, David Ogden, Esq., New York City.—14 years.—Ship "Escort," 1,454 tons, New York register, United States of America.—1. I have frequented the coasts of Ireland from the Skilling to Cape Clear, and Belfast; English coast from St. Agnes to the Clyde, and from Land's End to Downs.—2. North America from Cape Breton, Cape North, to Cape Florida, and from Cape St. Roque to Cape Horn, thence to Iparaiso, Callao, Acapulco, to Cape Mendocinoal, East Indies, &c. M.
498. JOHN HENRY.—Master of "Helen Wallace," 10, Upper Hill Street, Liverpool.—Liverpool.—May 17th, 1859.—27 years.—Ship "Helen Wallace," of Liverpool, 641 tons, Sailing Ship.—1. Not particularly, having been generally employed in foreign trade.—2. Not particularly, as I have not been in any regular trade, visiting a few ports only more than once. M.
499. ARCHIBALD HALLIDAY.—Commander, 14, Egerton Street, Liverpool.—15 years.—"Valdivia," 395, Liverpool.—1. East coast of Ireland.—2. East and west coast of South America, and Bay of Bengal, China Seas, &c. M.
500. JAMES AITKEN.—Master, 36, Duke Street.—22 years.—Ship "Tornado," of Glasgow, 1,220 tons.—1. I am acquainted in Queenstown without pilot, and all the east coast of Newfoundland.—2. The coasts of South America and the Continent. M.
501. WILLIAM STEWART.—Home passenger trade, Londonderry to Meville, 22, Lower Road, Londonderry.—19 years, apprenticed in 1840.—Steamer "Ardentinnny," of Londonderry, 75 horse (nominal) power, 68 tons.—1. The North Channel, generally, and west coast of Ireland; bays of Fundy and St. Lawrence.—2. From the Capes of Delaware to Boston in the United States. M.
502. THOMAS PERRY.—Master, South Main Street, Youghal, county Cork, Londonderry.—May 27th, 1859.—26 years.—"Victoria," 133 tons, London.—1. The English Channel, the Bristol, and St. George's Channels, and south-west coast of Ireland.—2. Mediterranean. M.
503. WILLIAM JOHNSTON.—27, William Street, Londonderry.—36 years, 27 of which I have been commander.—"Enniskillen," 401 tons, Londonderry, 300 horse power.—1. I am well acquainted with the English and Irish Channels, particularly the North Channel, where I have commanded steamers for 14 years. M.
504. SAMUEL HATRICK.—Master Mariner, opposite New Gate, Londonderry.—May 24th, 1859.—Nearly 40 years.—Not at present.—1. The last 35 years sailing out of almost all the ports of Great Britain.—2. 25 years master to North America, all the ports from Quebec to New Orleans. M.
505. EDWARD BARROW.—Barrowdale Road, Lancaster.—35 years.—"Duchess," Steamer, 130 tons, 40 horse power.—1. Between Liverpool and Lancaster.—2. Nil. M.
506. BENJAMIN BROCKBANK.—Master of the Schooner "James," from March 1838 to date, Sandside, Ulverstone.—May 26th, 1859.—45 years, always in the coasting trade.—Schooner "James," of Liverpool, 59 tons. M.
507. ROBERT BRIGGS.—Master, 4, Townley Street, Morecambe, Lancaster.—17 years.—Steam Ship "Arbutus," 236 tons, 70 horse power.—1. St. George's Channel, Irish Sea, north and east coasts of Ireland, Isle of Man.—2. Not having been in the foreign trade for the last seven years, I cannot give a comparative opinion to Questions 4, 5. M.
508. G. H. HOOD.—Master, "Iron Age," Barrow, near Ulverstone.—24 years.—"Iron Age," 339, London. M.
509. RICHARD BUSH.—Master Mariner, Arn Side, near Milnthrop.—26 years.—Master, "John of Lancaster," 47 tons.—1. St. George's Channel.—2. No. M.
510. GEORGE PAGE.—Ramgate.—28 May, 1859.—43 years.—Command the "Annie Denny," of Ramgate, 127 tons, Sailing Vessel.—1. Well acquainted with the east coast of England.—2. No. M.
511. WILLIAM WILSON.—Master, Brig "Gleaner," Bond Street, Hartlepool.—31 years.—21 years master of the Brig "Gleaner," of Scarborough, 239 tons.—1. East coast of England.—2. Coast of Germany. M.
512. T. R. MATTHEWS.—Shipowner, Torquay.—6th June, 1859.—25 years, 20 years master.—Retired.—1. English Channel.—2. Mediterranean. M.
513. JOHN DUFF MACKIE.—36, Albany Street, Leith.—4th June.—19 years.—Steam Ship "Holyrood," 70 horse power, Leith, register tonnage 295.—1. The east coast. M.
514. JOHN VIVIAN.—Secretary to Hayle and British Steam Packet Company, Hayle, Cornwall.—3d June, 1859.—45 years.—Not at present.—1. Not particularly, with the exception of the Bristol Channel. M.
515. GEORGE FITZSIMONS.—Master, Steamer "Blenheim," Belfast, Liverpool.—4th June, 1859.—30 years.—Steamer "Blenheim," of Belfast, 400 tons, 500 horse power.—1. St. George's Channel.—2. No. M.
516. JAMES A. CRUNDALL.—Master of "The James," Castle Street, Dover.—I have served as master over 20 years.—"The James," of Dover, 173 tons register.—1. Yes, from the Isle of Wight to Tynemouth.—2. No. M.
517. LEONARD GRENHAM STAR.—Bristol, General Steam Navigation Company.—14 years.—"St. Juno," Bristol, 155 tons, 120 horse power.—1. St. George's, Bristol, and English Channels.—2. The Baltic, Mediterranean, and Black Seas, New Holland, West Coast, South America, and South Sea Islands. M.
518. WILLIAM OUTERBRIDGE.—Commanding Steam Vessel "Calyso," Camden Terrace, Clifton Vale, Bristol.—35 years.—"Calyso," of Bristol, 364 tons, exclusive of engines, 120 horse power (nominal).—1. Bristol and St. George's Channels mostly.—2. I have been chiefly in the American trade. M.
519. EDWIN LITTEN.—30, Albion Street, Exmouth.—4th June, 1859.—I have served at sea from a boy, now 46 years of age; have been in command of a ship 22 years, and not one day out of employ, and I have served only one employer.—Brig "Delhi," 203 tons.—1. With the coast from the Holmes, in the Bristol Channel, to Tynemouth, on the east coast of England. Colonies, no.—2. Not acquainted, not having been foreign seas years. M.
520. JOHN FARRELL.—Master Mariner, Dundalk.—Dundalk, 6 June, 1859, care of Dundalk Steam Packet Company.—21 years nearly.—"Pride of Erin," 377 tons, Dundalk, 420 horse power, paddle steamer.—1. The Irish and Bristol Channels. M.
521. FRANCIS SMITH.—Master; at present bound out to Aden and Bombay. Liverpool, 5, Newton Street, Toxteth Park, Liverpool.—24 years.—"Rising Sun," 824 tons, Liverpool.—1. From Leith to London. M.
522. WILLIAM HENRY FURNER.—Master Mariner, 2, Bellevue Fields, Folkestone, Kent.—June 7th, 1859.—18 years; 8 as master.—Brigantine "Jason," 121 tons register, Port of Folkestone.—1. From Liverpool, round south about as far to the north as Girdleness in Scotland.—2. From Ushant to the Texel. M.
523. THOMAS M. ADRI.—General Merchant, Vae, Delfing, Shetland.—May 31st, 1859.—1. West coast of the Zetland Islands. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 524. WILLIAM BARBER SIMPSON.—Master Mariner, Liverpool.—30 years; I served seven years apprenticeship Steam Ship "Bocotia," 1,000 tons, 250 horse power.—1. Yes, British and St. George's Channels.—2. Yes, coast of France, Spain, and Portugal, Mediterranean, Levant, Black Sea, &c.
- M. 525. JAMES FOSTER.—3. Gun Cottages, Folkstone, Kent, Master Mariner.—June 7th, 1859.—26 years; 14 as master.—Brig "Chenamus," 243 tons register, port of Folkstone.—1. From Liverpool round South, about as far to the north as the Cocket Island.—2. No.
- M. 526. MATTHEW JONES.—Firm of M. Jones and Brothers, Ship Brokers, &c., Swansea.—17 years sail and steam.—I have commanded the Steamers "Prince of Wales," "Princess Royal," &c. belonging to Swansea, from 80 to 120 horse power.—1. The Bristol, St. George's, and English Channels, more particularly the British Channel.—2. Not well acquainted.
- M. 527. JOHN WHITE.—Master Mariner, 6, Hope Terrace, Leith.—June 7th, 1859.—36 years.—Steam Ship "Orient," 416 tons, 104 horse power, Port of Leith.—1. North of England and Scotland.—2. Norway and Cattagat.
528. J. R. CROSBIE.—Shipowner, &c. &c., Wexford.—28 years in the foreign trade, from Liverpool and London.—Retired.—1. English and Irish Channels; as a foreign trader, East and West Indies generally.—2. Island of Cuba, Gulf of Florida, Bahamas, parts of the coast of Brazil, &c.
- P. 529. WILLIAM VINCENT.—Pilot, St. Mawes, Cornwall, Port of Falmouth.—25 years.—The Pilot Cutter, the "Vincent," 43 tons, Falmouth Port.—1. From the Land's End to the Isle of Wight.—2. From Glen Islands to Jersey, Guernsey, &c.
- M. 530. JOHN POWER.—Ballinakill House, County Waterford.—25 years.—I command no ship or steamer at present.—1. The Gulf of St. Lawrence, the Bay of Fundy, and the three Channels.—2. The American coast from the Bay of Fundy to the River Plate, West Coast of Africa, and Mediterranean.
- M. 531. WILLIAM WAKE.—Harbour Master, North Shields.—June 10th, 1859.—32 years.—Commanded the "Mary Ann" 12 years, from 1821, and the "Margaret" 10 years, from 1834, both belonging to Newcastle.—1. I have a general knowledge of the coast of Great Britain.—2. I am well acquainted with the coasts in the Mediterranean, and particularly the Black Sea.
532. ROBERT SHANKLAND.—Shipowner, Greenock.—Greenock, 9 June, 1859.—1. The Clyde.—2. No.
- M. 533. WILLIAM HONKINS.—Master Mariner, 27, Upper Benn Street, Liverpool.—London, June 9th, 1859.—30 years.—Steam Ship "Empress Eugenie," 413 tons, 100 horse (nominal) power, Liverpool.—1. Yes, the Irish coast from Belfast to Cork, and English and Welsh from Liverpool to West Hartlepool.—2. No.
- M. 534. CARL HESSE.—Master of the Steam Ship "Schwaibe," Bremerhaven, near Bremen.—28th May, 1859.—22 years.—Screw Steam Ship "Schwalbe," 355 tons, 90 horse power, Bremen.—1. Acquainted with the coasts near the River Humber, and that to northward of the Thames, but not very well.—2. Coasts between River Weser and Terschelling, also coast of the Brazils, from Cape St. Roque to River Plate.
- M. 535. RALPH WATERS.—Hanover Square, Newcastle-upon-Tyne.—June 11th, 1859.—25 years.—West Chirton, 233, Newcastle-upon-Tyne.—1. East coast of England.—2. Partially acquainted with Baltic and Gulf of Finland.
- M. 536. W. P. STEVENSON.—Master Mariner, 1, Warwick Square, Kensington.—29 years.—Commanded 16 years; my last ship the "Maidstone," 1,000 tons, London; owners, Money, Wigram, and Sons, Blackwall.—1. South coast of England and the coast of Wales, south coast of Ireland, west and south coasts of Australia and Africa.—2. The coast of Hindustan, Ceylon, Burmah, Sumatra, Malacca, Java, China as far north as Shanghai, part of Denmark, Norway, and up the Baltic as far as Bomarsund, the coast of France, Portugal, and Spain, as far east as the Crimea.
- M. 537. DUGALD GRAHAM.—Master of "Clansman" Steamer, Messrs. D. Hutcheson and Co., 119, Hope Street, Glasgow.—8th June, 1859.—I have been 10 years coasting and 9 months upon a foreign voyage.—Steamer "Clansman," of Glasgow, 260 tons, 150 horse power.—1. Yes, with the west coast of Scotland, from the Firth of Clyde to Cape Wrath.—2. No, not acquainted.
- M. 538. JOHN ORLESCAR.—Commander, surveying Gulf St. Lawrence, &c., &c., Charlottetown, Prince Edward Island.—35 years.—Hired Surveying Schooner "Gulvan," 200 tons, Charlottetown, Prince Edward Island.—1. No.—2. Yes, Gulf St. Lawrence, south-east of Nova Scotia, and Cape Breton.
- M. 539. JOHN LYALL.—Maeduff, by Banff.—46 years.—"Earl Seafield," of Banff, 30 tons.—1. East and west coasts of Great Britain.—2. No.
- M. 540. THOMAS CLOKE HUNKIN.—Master Mariner, Guernsey.—Regent's Canal, Limehouse.—June 14th, 1859.—Yes, 25 years.—Brig "Julia," Guernsey, 210 tons.—1. I am well acquainted with the English Channel and north coast of England.—2. Not acquainted with any foreign parts, except France, north part.
- M. 541. LEONARD WATSON.—Lloyd's Agent, &c., Warrenpoint, Ireland.—June 11th, 1859.—Served an apprenticeship four years in the West India trade from Dublin, 1804 to 1808; at sea from 1804 to 1822, generally in the West India trade and Mediterranean; 13 years Commander and Owner from Dublin, Liverpool, London, and Bristol; retired from sea 1822.—1. From Start Point, County Down, to Tuskar, and other parts of the Channel generally.—2. West Indies generally, say, from Surinam to Jamaica, and coast of America.
- M. 542. A. P. FRENCH.—Care of Messrs. Laird, Fletcher, and Co., Castle Street, Liverpool.—18 years.—African Mail Steamer "Ethiopia," 468 tons register, 160 horse power.—1. Australian Colonies, Irish and St. George's Channels, West Coast of Africa.—2. Spain and Portugal, Turkey, France.
543. JAMES HOSEASON.—Merchant, Mossbank, Shetland or Zetland.—4th June, 1859.—14 years.—I had command of several Sailing Vessels: "Thule," 174, "Exile," 250, "Jour," 74, &c. I never commanded nor sailed in a steamer.—I was tolerably well acquainted with the Highlands, St. George's, and English Channels, Bay of Fundy, West India Islands, Guiana, &c., and coast of Zetland, but it being 23 years since I left sea, I know little now of their state in respect to lighting.—2. Ditto, coast of Brazil and Rio Plata chiefly. Same remarks apply; also, partially, Holland, Germany.
- M. 544. WILLIAM LAW TOOTHER.—Master, "P. Adler," Steam Ship, Roseneath, Queenstown.—36 years active service.—"Preussachor Adler" Steamer, Cork, 628 tons register, 400 horse power.—1. English and Irish Channels.—2. West India Islands.
- M. 545. GEORGE DLINCY.—North Quay, Yarmouth.—Yarmouth, 30th May, 1859.—39 years.—"Urania," 196 tons, Yarmouth, 80 horse power.—1. East coast of England.—2. France, Belgium, Denmark, and Holland.
- M. 546. FRANCIS WRIGHT.—Commander of the "Bold Buccleugh," South Quay, Yarmouth, Norfolk.—30 years, sailing ships and steamships.—"Bold Buccleugh" Steamer, 145 tons; port of register, Great Yarmouth, 120 horse power.—1. Yes, the east coast, namely, Norfolk, Suffolk, Lincolnshire, and Yorkshire.—2. None.
- F.M. 547. TANNER.—Master of the "Mas."
- M. 48. JOHN PICKTHALL.—Master Mariner, Messrs. Roberts and Griffith, 25, King Street, Liverpool.—21 years.—"Clarendon," 422, Liverpool.—1. St. George's Channel, the coast of Newfoundland, and North America.—2. Mediterranean, coast of Brazil.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

549. THOMAS ROURLANDS.—17 years.—“Resolution,” 115 tons, of Amhoeh, port of Benares.—1. St. George’s and English Channels.—2. No. F.M.
550. J. SNOCK.—Master of the “Jacoba Carolina,” now in Liverpool.—For 19 years.—“Jacoba Carolina,” 220 tons, of Amsterdam.—1. The south coast of England, along the English Channel, and the coast of British Guiana.—2. The coast of Holland, Java, Black Sea, Brazils, and Mediterranean. F.M.
551. HENRY R. KRÜGER.—Master Mariner, Spencer Street, Hull.—35 years.—1. East coast of England.—2. Southern shores of Baltic and Gulf of Finland, Cattagat, Norway, Sweden. M.
552. EDWARD HAYES.—Master Mariner.—Truro, Cornwall.—June 24th, 1859.—42 years.—“Kate,” 59 tons, Truro.—1. I am acquainted with the English, North, Bristol, and St. George’s Channels, and the south and south-west parts of the Irish coast.—2. I am acquainted with the Mediterranean, Black Sea, and the Gulf of Venice, Spain, and Portugal, and some ports in France. M.
553. GEORGE RAYNER.—Master Steam Ship “Barnsley,” 45, Francis Street West, Hull, Yorkshire.—June 22d, 1859.—29 years.—Steam Ship “Barnsley,” 340 register, South Grimsby, 80 horse power.—1. Cannot state any particular places.—2. No particulars to remark. M.
554. DAVID JONES.—Captain Ship “Orso,”—20 years.—Ship “Orso,” 747.—1. St. George’s Channel and North Channel, St. Lawrence, Gulf of Mexico.—2. New Orleans, Clyde, Liverpool. M.
555. JOHN H. JELICOE.—Commander, Royal Mail Steamer “Tasmania,” Southampton.—Southampton, June 21st, 1859.—22 years.—Royal Mail Steamer “Tasmania,” 2,253 tons, of London, 550 horse power.—1. English Channel and all British West India Islands, and coast of Guiana.—2. All French and Spanish Islands in the West Indies, Gulf of Mexico, coasts of Spain and Portugal, from Cape Finisterre to Cape St. Mary, and coast of Brazil. M.
556. JAMES TIER.—34, King Street, Southsea, Portsmouth.—31 May, 1859.—35 years, master 23 years.—“Sparrow Hawk,” of Portsmouth, 100 tons, coasting and fruit trade.—1. Yes, I am well acquainted with the coast of the United Kingdom.—2. Yes, Spain, France, and Portugal. M.
557. WILLIAM PAYNE.—Master Mariner, 4, Princes Street, Landport, Portsmouth.—40 years.—Schooner Yacht “Alia,” Royal Yacht Society, 113 tons, Portsmouth.—1. South and west coasts of England.—2. North coast of Spain and the coast of Portugal. M.
558. EDWARD GRIFFIN.—Master, Dalton Cottage, Southsea.—May 21, 1859.—Upwards of 16 years as Mate and Master in the coasting and East India trade.—“Champion,” of Portsmouth, in the fruit trade, 54 tons; now about to command a bark of 400 tons.—1. The English Channel and east coast of England.—2. The French coast in the Channel, and the Spanish and French in the Mediterranean, also the Portuguese coast. M.
559. RICHARD SHEPHARD.—Master, Shoreham, Sussex.—27th May, 1859.—20 years.—Brig “Ashley Down,” 226, register, of Portsmouth.—1. English and Bristol Channels and east coast of England.—2. French coast, Bay of Biscay, and Mediterranean. M.
560. W. ROSKELL.—Commanding Peninsula and Oriental Steamer “Panther,” in the mail service between Marseilles and Alexandria.—Marseilles, June 14th, 1859.—25 years.—Steam Ship “Panther,” of Glasgow, 750 tons, 320 horse power.—1. No, have been many years absent from England, sailing in India and China.—2. Yes, the south coast of China, the coast of Placensa, and those parts which lie in the route from Marseilles to Alexandria. M.
561. JOHN RANKIN.—Trading to the West Highlands of Scotland, 134, Blythswood Terrace, Bothwell Street, Glasgow.—June 10th, 1859.—Served 20 years at sea.—Command the Steam Ship “Stork,” 249 tons, of Glasgow, 260 horse power.—1. North-west and westward islands of Scotland. M.
562. EDWARD CHRISTIAN.—Commander, Milton Road, Woolstan, Southampton.—29 years.—Peninsula and Oriental Company’s Steamer, “Ripon,” 1,956 tons, 450 horse power.—1. Yes, the British Channel, from Southampton to the Lizard and Ushant.—2. Yes, the Bay of Bengal from Calcutta to Galle, and from Calcutta to Singapore; also the China Sea on the west side of Hong Kong, and thence to Shanghai; also the Peninsula coast from Sargassos to Gibraltar, and from thence along the coast of Africa to Alexandria. M.
563. WILLIAM CARGILL.—Master, 25, Regent Quay, Aberdeen.—London, 21st June, 1859.—41 years, and 33 as master in foreign and coasting trade.—“Hamburg,” 436 tons, of London, 250 horse power.—1. From Cape Wrath, Murray Firth, and Firth of Forth, east coast to London. M.
564. WILLIAM JOHN WADE.—Master Mariner, 2, Barnes Street, Limehouse.—June 20, 1859.—From 1820 to the present year.—“Germania” Screw Steamer, London, register tonnage 428, gross tonnage 630, horse power 100.—1. East coast of England.—2. From Texel to the Elbe. M.
565. ROBERT ANDERSON.—North Sea and Channel Pilot, 4, North Street, Deal, Kent. My present occupation for the last 12 years has been as a North Sea and Baltic, Hamburg, Bremen, Rotterdam, Amsterdam, and Antwerp, also in the three Channels, as Pilot. I have piloted H.M.S. of the line down to 4-gun gunboats. I have piloted ships of all nations in great numbers, say, 400 tons, 1,200, up to 2,500 tons. I was pilot of the European and American steamers in the Hamburg, Bremen, and to and from Southampton, the “Queen of the South,” 2,500 tons; the “Argo,” 2,550 tons; the “Jason,” 2,600 tons. I was pilot and master of the American Yacht “Silvery,” to St. Petersburg, when we lost our rudder in a heavy gale in the North Sea. I was also pilot of the American Steam Frigate “Saint Sinter,” 2,000 tons, 500 horse power, from Southampton to St. Petersburg and back. I was also pilot of the Austrian Frigate “Carlena,” the finest of that nation that was at St. Petersburg or in the North Sea. I could say much more if wanted.—June 18th, 1859.—I have served at sea about 49 years. I served 7 years as apprentice out of the port of Newcastle-on-Tyne. I was several years mate out of the same port in the coal and Baltic, Hamburg, Bremen, Rotterdam, Antwerp trade; also, out of the same port in the Northern Sea and Archangel trade; other voyages also in the North Sea.—I have commanded five different ships:—the “Roseville,” of Stockton, 180 tons; the “Woodbridge,” of London, 650 tons; the “Jupiter,” of London, 150 tons; the “Rambler,” of London, 195 tons; the “Rubicon,” of Hull, 310 tons; and after this ship I was employed in taking out steam ships for the Russian Government to St. Petersburg and Black Sea, built by Sir John and George Rennie, London.—1. I have sailed all round the United Kingdom several times, and I have been in all the three channels. I have been several voyages to the colonies, the Cape of Good Hope, the Isle of France, and the West Indies, Halifax, Quebec, Newfoundland, and St. John’s, N. B., Pitte, and Malta.—2. I am well acquainted with all the ports in the Straits of Gibraltar and the Black Sea, Odessa, Kerch, Varna, the Danube, the Bosphorus, Constantinople, Gallipoli, and the Dardanelles, the Tyshen, Smyrna, Alexandria, Mytilini, Zea, Milo, Rhodes, Zante, Cephalonia, Corfu, Manfredonia, and Ancona, Ragusa. P.
566. THOMAS SPENCER.—North Sea Pilot, 3, Keppel Street, South Shields.—June 18th, 1859.—40 years.—Not in command at present.—1. East coast.—2. Sleeve, Cattagat, East Sea. P.
567. WILLIAM HIND CRAVEN.—Master Mariner, 15, Olive Street, Bishopwearmouth, Sunderland.—June 16th, at sea, —27 years.—“Vere,” of Sunderland, 340 tons.—1. From Land’s End to the Pentland Firth.—2. All the Baltic, France, Spain, Portugal, and all parts of the Mediterranean. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 568. T. N. BEVIS.—Commander Royal Mail Steam Packet Company's service, Southampton.—20 years.—“Parana,” of London, 2,500 tons, 800 horse power.—1 & 2. English Channel, coast of Brazil, West Indies, Gulf of Mexico, and part of Central America.
- M. 569. JOHN STACEY.—2. Merchants' Place, Hotwells.—40 years.—“Princess Royal” Steamer, 68 tons, Bristol, 60 horse power.—1. Yes, the Bristol Channel.—2. No.
- M. 570. WILLIAM VINCENT.—Southampton.—32 years.—Marine Superintendent Royal Mail Company, Southampton. Have commanded several of their ships.—1. English Channel and West Indies.—2. Brazil, Gulf of Mexico, and part of Central America.
- M. 571. FREDERICK BECKER.—Master of “Glen Almond,” now loading for Cronstadt, 2, Union Place, Newhaven, Leith.—June 19th, 1859.—21 years.—“Glen Almond,” of Glasgow, 250 tons register.—1. South and east coasts of England and Scotland.—2. North coasts of France, Holland, German coast, Cattagat, Sweden, Prussia, Russia as far as Cronstadt, Mediterranean, Brazil, West Indies, east coast of United States.
- R.N. 572. F. W. L. THOMAS.—Lieutenant commanding H.M.S. “Woodlark.”—11th June, 1859, Harris, Hebrides.—33 years.—H.M.S. “Woodlark,” 80 tons.—1. Yes, the east and north of Britain.—2. No.
- M. 573. ARTHUR J. REED.—Master Mariner, Ship “Earl of Elgin,” London Docks.—18 years.—“Earl of Elgin,” 1,127 tons, Bridgewater.—1. Stanley Harbour, Falkland Islands, St. George's Channel, and Liverpool Bay.—2. West Coast, South America.
- M. 574. WILLIAM GILBERT JEWSON.—Master, 79, Bedford Street, Toxteth Bark, Liverpool.—20 years.—“Byron,” 189, Liverpool.—1. St. George's Channel and the east coast.—2. Para, River Amazon, West India Isles, and River Plate.
- M. 575. ROBERT WALKER.—Master, Ship “Sarah and Emma,” Messrs. Fernie, Brothers, Liverpool.—26 years.—Ship “Sarah and Emma,” 1,064 tons, Liverpool.—1. Cape Colony, Falkland Islands, south coast of Ireland.—2. Gulfs of Florida and Mexico, coasts of Malabar, Comorandel, west coast of America.
- M. 576. CHARLES WALKER.—Master, Steam Ship “Sligo.”—21st June, 1859.—30 years.—Steam Ship “Sligo,” 191 tons, Sligo, 70 horse power.—1. The North Channel and the north-west coast of Ireland.
- M. 577. JAMES CHESTER.—Chief Officer of the Ship “Queen,” 64, Chester Street, Liverpool.—25 years.—Post Captain, “Cahena.” Absent.—1. Well acquainted with St. George's Channel.—2. West coast of America.
- M. 578. SAMUEL FOLLETT.—81, Upper Hill Street, Liverpool.—Served 17 years.—Steam Ship “Calpee,” of Liverpool, 160 horse power.—1. English and St. George's Channels.—2. Generally as to Mediterranean and Portuguese coasts.
- M. 579. PETER DIXON DODD.—39, Wear Street, Sunderland.—May 24th, 1859.—40 years, 29 years Master.—I left the sea in 1857, last ship “Danson,” 217 tons, of Sunderland.—1 am now an agent on my own account in connexion with the Shipping Office.—1. Yes, east coast of England, English Channel, Bristol Channel, New Brunswick, Quebec, and Newfoundland.—2. Yes, Baltic, Gulf of Finland, Spain, and Portugal to Gibraltar.
- M. 580. PHILIP HILMAN.—Master, 6, Marlborough Hill Place, Kingsdown, Bristol.—20 June, 1859.—28 years.—Steam Ship “Pioneer,” 257 tons, Bristol, 100 horse power.—1. English and Bristol Channels.—2. The coast of France from Ushant to the entrance of Bordeaux River.
- M. 581. JOHN SKELLY.—Mariner, Gurtiestown.—21st June 1859.—41 years.—“Creo,” 43 tons, of Wigtown.—1. I am well acquainted with all the coasts of the United Kingdom.—2. I am acquainted with the coasts of the Baltic and the Mediterranean.
- M. 582. THOMAS SMALL.—8, Water Street, Liverpool.—26 years.—5 years in the service of the British and North American (Cunard) Company.—1. English and St. George's Channels.
- M. 583. GEORGE LITTLE.—Steam Ship “Balbee,” Liverpool, Messrs. Burns and MacIver, Liverpool.—June 21st, 1859.—28 years.—“Balbee,” 614, “Glasgow,” 160.—1. British and St. George's Channels, from Dungeness to Clyde.—2. French Coast.
- M. 584. E. M. HOCKLE.—Commanding Steam Ship “Etna,” Messrs. D. and C. MacIver, Liverpool.—21st June, 1859.—24 years.—Steam Ship “Etna,” 2,240 tons, “Glasgow,” 500 horse power.—1. Acquainted with south and west coasts, United Kingdom.—2. With Mediterranean.
- M. 585. E. J. LOTT.—Master Mariner, 159, Upper Parliament Street, Liverpool.—30 years, 18 years Master of a Steam Ship in the British and North American Steam Packet Company.—I command the Royal Mail Steam Ship “Asia,” of Glasgow, 2,222 tons, and 800 horse power.—1. I am acquainted with England, Wales, Ireland, Nova Scotia.—2. With the United States, France.
- M. 586. JOHN HARRISON.—25 years.
- M. 587. JAMES STONE.—Master Mariner, 8, Water Street, Liverpool.—28 years; 15 in the “Cunard” Steamer; 11 years Master in the Cunard Steam Ships.—1. St. George's and North Channels.—2. Boston and New York, Bays United States, and east coast of Nova Scotia.
- R.N. 588. W. F. MILLAR.—28 years, 12 in Cunard service.—H.M.S. “Niagara,” of Glasgow, 650 horse power.—1. English and Irish Channels, north and south-east coasts of Nova Scotia.—2. Coast of France, from Ushant to Calais, west coast of Spain and Portugal, and Mediterranean generally, Boston and New York Bays.
- M. 589. WILLIAM F. MACARTHUR.—Messrs. Burns and MacIver, Runford Street, Liverpool.—20 years.—“Teneriffe” Screw Steamer, of Glasgow, 812 tons register, and 180 horse power.—1. St. George's Channel, English Channel, and north coast of Ireland.—2. Coasts of Spain and Portugal, and the coasts of the Mediterranean generally.
- P. 590. JAMES H. LANGLOIS.—No. 16, Cornet Street, St. Peter Port, Guernsey, and holding a Branch Pilot Licence for Channel Islands.—26 years.—“Providence,” of Guernsey, 120 tons horse power.—1. Yes, the English Channel.—2. The coast of Normandy, and part of the coast of Brittany.
- R.N. 591. JOSH. ROWETH.—Master of Her Majesty's Lighter “Devon.” Her Majesty's dockyard, Devonport.—18 July, 1858.—35 years.—Master of Her Majesty's Lighter “Devon,” 154 tons, belonging to Devonport Dockyard.—1. I am acquainted with most parts of the coast of the United Kingdom, but more particularly the west coast.—2. Not acquainted with any foreign coast.
- M. 592. WILLIAM HAMILTON.—Master Mariner, Great Crosby, near Liverpool.—6th June, 1859.—27 years.—“Stanley,” 376 tons, Liverpool, 90 horse power.—1. East and south coasts of Ireland and St. George's Channel.
- M. 593. Captain A. NOBLE.—Shore Master for the port and harbour of Fraserburg, Aberdeenshire.—July 5th, 1859.—Since the year 1819.—Commanded the “Indian Chief” for six years, 410 tons, port of Peterhead, and likewise seven other vessels from 75 tons and upwards to 1,300 tons, and 23 years a Ship Master.—1. Well acquainted with all the coast of the United Kingdom, and of the colonies, of the Cape of Good Hope, Mauritius, Ceylon, Bay of Bengal, Australia, and South-east coast of America.—2. Well acquainted with the above named.
- M. 594. WILLIAM SMITH.—Retired Master Mariner, Pelman, near Fenny, Cornwall.—I have served at sea 38 years.—I have commanded the “Susan,” of Plymouth, the “William and Amelia,” of Fenny, the “Ann and Elizabeth,” of Fenny, and the “East Cornwall,” of Fenny.—1. I am acquainted with the coast from Liverpool to Bristol Channel, and the English Channel; been master of vessels trading from Wales to London 23 years.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

595. JAMES LACKLAND.—Master Mariner; address, John Street, Seaham, county of Durham.—I have served at sea 27 years, from August 1832.—I command a vessel name of "The Graces," 168 tons register, which vessel was registered at Sunderland.—1. I am acquainted with the north coast from the Tyne to the Thames.—2. I am well acquainted with the French coast from Dunquirke to Cape De le Heve. M.
596. FRANCIS LIVERSEED.—Master Mariner, 44, South Durham Street, Sunderland.—Alexandria, June 18th, 1850.—About 30 years, Master 20 years.—"Phoenix," 251 tons, Sunderland.—1. I am well acquainted with the east coast of England from Lynemouth to the Land's End.—2. Not very well acquainted with foreign coasts, except the Mediterranean and Black Seas. M.
597. ELI C. BLISS.—Master for 35 years, Royal Hotel, Liverpool.—48 years.—Ship "Commodore," of Boston, United States, 1,119 tons.—1. St. George's Channel and English Channel.—2. France. M.
598. E. J. P. PEARN.—Master Attendant, Royal Victoria Yard, Deptford.—8th July, 1859.—32 years, exclusive of time served as Master Attendant.—No.—1. English Channel, but have not navigated it during the last nine years.—2. It is so long since I have been employed for any length of time on a foreign coast that I cannot say that I am now well acquainted with any. R.N.
599. A. GREELY CUTTER.—Shipmaster, Portland, United States of America.—27 years.—Ship "Eliphalet Greely," of Portland, United States, 949 tons.—1. I cannot claim to be a Pilot to any port, but am acquainted with the channels sufficient for general purposes.—2. Better acquainted with the coast of the United States than any other. F.M.
600. WILLIAM H. PETCH.—Master, and Pilot of Her Majesty's ship "Diadem," Hamoaze.—July 13th, 1859.—27 years.—1. English Channel, Sierra Leone, all our Colonies in the West Indies, Irish Channel from Cape Clear to Tuscar light.—2. Sierra Leone to Cape Mesurada, and from Cape Lopez to Elephant Bay, coast of Africa, West Indies, White Sea, entrance to Archangel. R.N.
601. THOMAS F. FREEMAN.—Master Mariner, Guion and Co., Liverpool.—Constantly since November 1854.—Ship "Resolute," of New York, 1,500 tons.—1. From Liverpool to Cape Clear more particularly, also the North Channel.—2. United States, from Capes of Virginia to Sandy Hook, and South Side, Long Island. M.
602. WILLIAM IVEY.—Master Mariner and Queen's Pilot, Pembroke Dockyard.—Dated this 6th August, 1859.—45 years.—Her Majesty's Lighter "Sheppy," 109 tons, belonging to Pembroke Dockyard.—1. English, Bristol, and St. George's Channels.—2. Not acquainted. M.P.
603. BENJAMIN STEVENS.—Master Mariner, Newhaven, Sussex.—Sunderland, 2d August.—18 years.—"Galway Lass," 201 tons, Newhaven.—1. I am acquainted from the Bristol Channel to the north coast of England.—2. Not well acquainted. M.
604. PHILIP BOUTCHER.—Master Mariner, 39, Yellow Road; at present unemployed.—Waterford, 18th June, 1859.—I have served at sea 29 years.—None at present.—1. I am intimately acquainted with the St. George's, English, and Bristol Channels.—2. I am acquainted with the West Indies, North America, Mediterranean, and coasts of France, Portugal, and Spain. M.
605. JOHN JOSEPH HAMMACK.—Master Mariner, Royal Mail Steam Packet Company's Office, Southampton.—Kingston, Jamaica, June 26th, 1859.—26 years.—Royal Mail Company's steamer "Eagle," 620 tons, 250 horse power, of London, now on service West Indies.—1. I have a general knowledge of the British Channel, coasts of Australia, India, and West Indies.—2. A general knowledge of the Mediterranean and Black Sea and coast of Brazil. M.
606. EDWARD WILLIAMS.—Master Mariner, Portmarine.—9th July, 1859, Runcorn.—About 26 years.—"Harriet Preston," 58, Caernarvon; "John Preston," 126, Caernarvon; "Alice Preston," 64, Caernarvon.—1. Yes, with all the parts.—2. Yes, from Ushant to Cronstadt and other parts in the Mediterranean Sea. M.
607. ROBERT TAGGART.—Master Pilot, Upper Hill Street, Toxteth Park, Liverpool.—August 2d, 1859.—35 years.—Pilot boat "The Queen," No. 1, 2d Master.—1. Holyhead, round the coast to St. Bee's Head, and Isle of Man.—2. No. P.
608. JOHN WILLIAMS.—Master Pilot, Sea View Road, Liskeard, Cheshire.—August 8th, 1859.—31 years.—Pilot boat "The Duke," No. 3, 70 tons.—1. From Holyhead to Liverpool and Whitehaven, and round the Isle of Man.—2. No. P.
609. WILLIAM HUGHES.—Master Pilot, Fairfield Crescent, near Liverpool.—July 26th, 1859.—39 years.—Pilot boat No. 1. "The Queen."—1. Liverpool Bay, from St. Bee's to Holyhead, Isle of Man, St. George's Channel. P.
610. ISAAC WILLIAMS.—Master, No. 5, Pilot boat, 107, Roscommon Street, Everton.—August 3rd, 1859.—28 years.—Pilot boat "Victoria and Albert," No. 5.—1. Liverpool Bay, Isle of Man. M.
611. JOHN BARK.—Master Pilot, Barkfield Villas, Formby.—August 8th, 1859.—46 years.—Pilot boat "Albert Edward, Prince of Wales," No. 8.—1. Holyhead to Liverpool, round to St. Bee's Head, and Isle of Man. P.
612. JAMES WILSON.—Master Pilot, 280, Crown Street, Liverpool.—August 10th, 1859.—43 years.—Pilot boat "The Criterion," No. 10, 56 tons.—1. Liverpool Bay, from Holyhead round to Whitehaven, including the Isle of Man.—2. No. P.
613. JOHN THOMPSON.—Master and Pilot, Her Majesty's ship "Himalaya," Plymouth Sound; on shore, Hawkfield House, Leith, Edinburgh.—20 years in November next.—1. Downs to Scilly.—2. Coast of Africa and Brazils, also Portugal. R.N.
614. WILLIAM ROWLANDS.—Master Pilot, 28, Great Mersey Street, Kirkdale.—30 years.—"George Canning," Pilot boat No. 7, Liverpool.—1. Liverpool Bay, from South Stack to St. Bee's, Isle of Man, part of Irish Sea. P.
615. HUGH WOODWARD.—Master Pilot, No. 90, Camden Street, Woodside, Cheshire.—July 16th, 1859.—56 years.—Pilot boat "Perseverance," No. 12.—1. The coasts of the Irish Sea.—2. No. P.
616. HUGH JONES.—Master Pilot, 73, Everton Terrace, Everton.—July 16th, 1859.—25 years.—Pilot boat "Victoria and Albert," No. 5, 2d Master.—1. Isle of Man, from the Skerries round the Bay to St. Bee's Head. P.
617. ROBERT WILLIAMS.—Master Pilot, 120, Field Street, Everton, near Liverpool.—26 years.—Liverpool Pilot Cutter "Mersey,"—1. I am well acquainted with Liverpool Bay, along the Welsh coast to Holyhead, the Isle of Man, and from St. Bee's Head, Cumberland, to Lancaster Bay, &c. P.
618. JOSEPH POWELL.—Master Pilot, 48, Stafford Street, Liverpool.—July 16th, 1859.—27 years.—Pilot boat "Leader," No. 2.—1. From Holyhead to Liverpool, round to St. Bee's Head, and Isle of Man, part of east coast of Ireland. P.
619. GEORGE BARKER.—Charlestown, Massachusetts.—I have commanded ships for 28 years.—Ship "Sea King," American, 1,350 tons, Boston, United States.—1. English and St. George's Channels.—2. The coast of America, Gulf of Mexico. F.M.
620. D. RUNNOLDSON.—In command of Steam Ship "Bengal" between Calcutta and Suez, Peninsular and Oriental Steam Navigation Company.—1st August, 1859, at Suez.—24 years.—Indian steam ship "Bengal," London, 2,130 tons, 450 horse power. M.
621. THOMAS E. ANGEL.—Superintendent of Shipping, 9, South Parade, Waterford.—Waterford, June 2d, 1859.—25 years.—For many years Schooner "Prudence," of Waterford, 150 tons register, in coasting and foreign trade.—1. Yes, from Waterford in Ireland to London by the Land's End of England.—2. Not very well. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 622. JOHN WILLIAMS.—“Independence,” Warren Point or Nerry.—32 years, 15 years in command.—Steamer “Independence,” Glasgow, 330 register tonnage, 220 horse power.—1. Yes, with nearly all ports in English and Irish Channels, and many in the Bristol Channel.—2. Brazil, the Mediterranean and British America.
- M. 623. J. A. MARTYN.—Commanding Steamer Ship “Lebanon,” 8, Water Street, Liverpool.—22d June, 1859.—27 years.—Steam Ship “Lebanon,” of Glasgow, 417 tons, 300 horse power.—1. Have frequently navigated English and Irish Channels.—2. Have been many times up and down Mediterranean.
- M. 624. JAMES ANDERSON.—Steam Ship “Etna,” 8, Water Street.—20 years.—British and North American Royal Mail Service.—1. From Liverpool to Southampton and Havre, south coast of Ireland from Dublin to the Skellys.—2. The coast of America from Cape Race to New York, Cape Horn to Guayaquil, Mediterranean, coasts of India and China, and Persian Gulf 7 years.
- M. 625. GEORGE LANGLANDS.—Messrs. Burns and MacIver, Liverpool.—18 years.—“Melita,” 853 tons, Glasgow, 180 horse power.—1. English, St. George’s, and Irish Channels.—2. Better acquainted with those parts passed in a Mediterranean voyage.
- M. 626. THOMAS KEAY.—Ship’s Husband, 5, Stainby Terrace, East India Road.—July 30th, 1859.—From 1810 to this date in various capacities from cabin boy to captain.—1. The east and north parts of Scotland.—The coasts of South America east and west.
- M. 627. JOHN R. BELL.—Messrs. Burns and MacIver, Liverpool.—30 years.—Steam Ship “Damascus,” of Glasgow, 825 tons, 400 horse power.—1. Yes, St. George’s Channel, Malta, Gibraltar, &c.—2. Yes, Spain, Russia, and the Mediterranean coasts, and Baltic.
- M. 628. JAMES KENNEDY.—William Inman, Esq., Water Street, Liverpool.—15 years.—Steam Ship “City of Manchester,” 2,109 tons, Liverpool, 400 horse power.—1. St. George’s Channel.—2. Cape Race to Delaware.
- P. 629. A PILOT from Shields to the Downs, Clive Street, North Shields.—For 45 years.—1. The east coast from the Pentland Firth to the Lizard; Colonies, Halifax to Quebec, Newfoundland.—2. Norway, Denmark, Sweden, Prussia, Russia, France, Spain, Egypt.
- P. 630. HENRY INGO.—Pilot to Downs or North Sea, Clive Street, North Shields.—July 24th.—Upwards of 40 years.—1. The east coast of England, North America, and Newfoundland.—2. Norway, Denmark, Sweden, Prussia, and Russia, Portugal, Spain, Egypt, France.
631. HUGH SHEGUTHEN.—Tresco, Scilly Isles, Agent, Trinity Corporation.—For 23 years previous to 1840.—1. I am well acquainted with the coasts of the United Kingdom.—2. Mediterranean, Baltic, South America, &c.
632. WILLIAM FORREST.—29, Green Street, South Shields.—July 13th, 1859.—About 36 years.—Retired.—1. From the Tyne to Gravesend, Kent, and Downs.—2. Sleeve to Copenhagen and Baltic Sea.
- M. 633. JOSEPH GRAY.—Shipowner, No. 30, Green Street, South Shields.—July 15th, 1859.—40 years.—Brig “Fanny,” 216 tons, Newcastle, master 12 years; Brig “Columbus,” 216 tons, Newcastle, master 12 years.—1. Thames to Tyne.
- M. 634. RICHARD I. BELETREE.—Commanding Bark “Glanmire,” West Indian trade, 2, Thomond Square, Cork.—34 years.—“Glanmire,” 231 tons, Cork.—1. No.—2. No.
- R.N. 635. ALEXANDER HENNING.—Royal Navy, for many years commanded East India ship, No. 8, Orsett Place, Paddington.—Upwards of 40 years.—Retired from the sea.—1. With the English Channel, the Malabar coast, and the west coast of Sumatra.
- M. 636. JAMES THOMAS WHITE.—1, New London Street, E.C.—30 years.—“Britannia,” 917 tons gross, London, 120 horse power.—1. East coast of England, English Channel, and St. George’s Channel.—2. West coast of Holland, north coast of Holland, west coast of Portugal, and south-west coast of Spain.
- M. 637. GEORGE WILLIAM HICKS.—1, Brunswick Place, Southampton.—23 years.—1 command the “Behai,” Peninsular and Oriental Steamer, of London, 350 horse power, 1,650 tons.—1. Yes, with the south coast of England.—2. With the coast of Spain and Portugal.
- M. 638. WILLIAM PHILLIPS.—Service of General Steam Navigation Company, 12, Princes Street, Rotherhithe.—42 years.—The “Princess Royal,” of London, 494 registered tons, 270 horse power.—1. I am well acquainted with those parts of the coast of the United Kingdom situated between London and Dungeness southward, and London and Leith northward.—2. I am well acquainted with those foreign coasts situated between Cape de Heve in France and the River Elbe.
- R.M. 639. WILLIAM KNOCKER.—Retired from active occupation, and on the retired list of Lieutenants R.N. Address, Castle Hill, Dover.—22d July, 1859.—From 1806 to 1850 without intermission.—Do not now command any vessel, but have been constantly in command from 1819 to 1850.—1. Well acquainted with the coast from Harwich to the Humber and Flamborough Head; partially so with the whole coast of the British and St. George’s Channels.—2. Well acquainted with the coast of Holland, the River Elbe, the Sleeve, Cattegat, the Baltic to Cronstadt.
- M. 640. WILLIAM J. HENDERSON.—Superintendent afloat to the Bridgewater Trust, Merionville, Oxton, Cheshire.—July 2th, 1859.—38 years, 29 as master.—1. St. George’s Channel, Liverpool Bay, Shetland Isles, Australia, Canada, India, Cape of Good Hope, east coast of Great Britain.—2. China, Indian coasts generally, United States.
- Y. 641. C. R. M. TALBOT.—Y.C. Royal Yacht Squadron, 3, Cavendish Square, London.—August 3d, 1859.—“Capricorn,” 418 tons, Screw Schooner.—1. The coasts of the Bristol, English, and St. George’s Channels.—2. French, Spanish, and Italian coasts.
- M. 642. LUKE SMITHETT.—Dover.—26 years.—Do not at present command any particular vessel, although am often afloat, having the Superintendence of the packet service at Dover.—1. Am acquainted with most of the coasts of the United Kingdom of England, Scotland, and Ireland, also the Channel and Scilly Islands, and the Isle of Man.—2. Am acquainted with the coast of France from Cherbourg to Dunkirk, the coasts of Belgium and Holland.
643. ANTHONY DUDLEY.—36, Gloucester Gardens, Hyde Park.—A quarter of a century certainly.—Commanded several vessels, but not for several years past.—1. Formerly I knew the east coast of England well, but so many alterations in lights, &c. have been made that I fear my present knowledge would not serve.—2. The same will apply to coasts in the North Sea and Baltic, which I once also knew, but my long residence ashore renders my present knowledge almost valueless.
- F.M. 644. P. E. PETRIE.—Commander of the under-named vessel in the service of the Liverpool, New York, and the Philadelphia Steamship Company, Water Street, Liverpool.—July 4th, 1859.—20 years.—Steamship “City of Washington,” 1,516 tons, of Liverpool, 500 horse power.—1. Irish, St. George’s, and North Channels.
- M. 645. THOMAS W. SAWYER.—Commander, 4, Waterloo Place, Southampton.—29 years.—Royal Mail Steamship “Tyne,” of London, 1,788 tons, 400 horse power.—1. English Channel, Ushant to Southampton; West Indies and Bahamas.—2. Brazil, Pernambuco to Rio; Gulf of Mexico, Vera Cruz to Tampico; South America, St. Martha to Greytown; Cape Finisterre to Cape St. Vincent.
- M. 646. CHARLES ROLLADON.—16, Fenchurch Street, London, E.C.—July 6th, 1859.—35 years.—“Gilbert Munro,” 258 tons London.—1. With lights in Channel from Scilly to North Foreland.—2. With coast of France from Ushant to Cape Griznez.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

647. **FREDERICK SIMPSON.**—Pilot, Liverpool; Address, Old Churchyard, Liverpool.—July 18th, 1859.—13 years.—P.
1. From Holyhead to Walney Island, and the Isle of Man.—2. Not acquainted with any.
648. **P. M. WOOLCOTT.**—Commander in the Royal Mail Steam Packet Company's Service, Southampton.—5th August, 1859.—16 years.—I have been in command of the Royal Mail Steam Company's steamers for six years.—1. West Indies.—2. Gulf of Mexico and Spanish Main. M
649. **CHARLES POWELL.**—Commanding School Frigate "Conway," Liverpool.—17 years.—Have commanded West Indian Mail Steamers of 1,800 tons, 450 horse power, and Liverpool Screw Steamers of 2,000 tons and 500 horse power.—1. English Channel from Scilly to Southampton, and northern part of Irish Channel to Roy's Island.—2. Coasts of Newfoundland, Nova Scotia and Maine, United States, the Straits of Belle Isle, and River St. Lawrence, the West Indies in every part, and Gulf of Mexico. M.
650. **EDWIN R. MOODIE.**—Water Street, Liverpool.—12th July, 1859.—20 years.—Steamship "Jura," 2,240 tons, 450 horse power, Glasgow, Cunard Company.—1. English and St. George's Channels.—2. From Cape Race to New York, and Mediterranean. M.
651. **WILLIAM WALKER.**—Commander, R.N., at present Examiner in Navigation, Local Marine Board, Plymouth.—Went to sea in 1797 in the Mercantile Marine, and served 10 years in it, then to the Royal Navy.—Commanded Her Majesty's Steamship "Despatch" five years, but have had separate charge and command of some 40 ships at sea in the Royal Navy of every class of sailing and steamships, as a Master Attendant.—1. Pretty well acquainted with the coasts of the United Kingdom and of Europe, also with the Cape of Good Hope Navigation.—2. Norway, Sweden, Russia, Denmark, Holland, France, Spain, Portugal, and also in the Mediterranean, but years have elapsed since I frequented these coasts. R.N.
652. **W. H. ROBERTS.**—In command of the under-mentioned ship, Peninsular and Oriental Steam Navigation Company's Offices, 4, Place Royal, at Marseilles.—July 17th, 1859, at Malta.—24 years.—"Ellora," 1,760 tons, London—a steamer of 350 horse power.—1. No.—2. South coast of France, Straits of Buonafacci, Malta, Alexandria. M.
653. **CHARLES MONTAGUE JONES.**—Commander of "Premier," H. Rodrick, 22, Fenchurch Street, London.—Upwards of 21 years.—Barque "Premier," of London, 308 tons.—1. From the River Tyne to the Land's End, thence to the Bristol Channel, the latter included, British Channel Islands, West Indies, and coast of South America from Berbice to Essequibo.—2. Coast of France from Dieppe to Cape La Hague, Cherbourg included. M.
654. **GEORGE WILLIAM HOWE.**—C. Grimshaw and Co., Liverpool.—38 years, to Liverpool, London, and Havre mostly, and two voyages to India, one voyage to Quebec, and four to New Orleans and Mobile.—Ship "America," of New York, 1,137 tons.—1. Australia, Calcutta, Bombay, Quebec, Gulf of Mexico.—2. As above, but not well acquainted. M.
655. (*Duplicate of No. 593.*)
656. **WILLIAM MARTYN.**—Master Attendant, Sheerness Dockyard.—12th July, 1859.—1. With the British and St. George's Channels.—2. Yes, with east coast of America (North and South), West Indies, west coast of Africa, and Cape of Good Hope. R.N.
657. **CHARLES POPE.**—Master Attendant, Chatham Yard.—July 7th, 1859.—I have served at sea in the East India Company's Service and Royal Navy nearly 30 years.—I do not command any vessel.—1. I am well acquainted with the English coast from Scilly to the North Foreland.—2. I have been much employed on foreign coasts, but so long ago that it would be presumptuous in me to offer any information about them. R.N.
658. **GEORGE P. HEATHER.**—Master of Her Majesty's Ship "Clio," Sheerness.—14 years.—1. Yes, the south coast of England and Malta.—2. Mediterranean, coast of Africa to Fernando Po. R.N.
659. (*Duplicate of No. 657.*)
660. **D. CRAIGIE.**—Master of Her Majesty's Ship "Saturn," and Queen's Harbour Master of Pembroke Dock.—Over 40 years.—Do not command a vessel.—1. Pretty well acquainted with the English Channel, and Australia, New Zealand, and India, New Sydney, Hobart Town, Swan River, east side of North Island and Cook's Straits, New Madras, and Rangoon.—2. Coasts of Spain and Portugal from Cadiz to Passages, River Tagus. R.N.
661. (*Duplicate of No. 660.*)
662. (*Duplicate of No. 660.*)
663. (*Duplicate of No. 660.*)
664. (*Duplicate of No. 660.*)
665. **JAMES CLARK.**—Master, Broughty Ferry, East Dundee.—20 years.—"Bengal," Dundee, 846 tons.—1. Bay of Bengal.—2. West coast of South America from Valparaiso to Callao. M.
666. **D. M. D. JAGO.**—Master of Her Majesty's Ship "Neptune," Portsmouth.—10th July, 1859.—36 years.—Master of "Himalaya," and now of "Neptune."—1. I am tolerably well acquainted with the English Channel.—2. I am acquainted with the coast from the Cape of Good Hope to Natal, east coast of America, coast of Portugal, and the coast of America in the Pacific. R.N.
667. **JOHN SIDNEY SMITH, R.N.**—Master of Her Majesty's Ship "Imperieuse."—About 20 years.—Not in command.—1. Only the English Channel.—2. A fair knowledge of the west coast of Africa. R.N.
668. **W. P. BRAUND.**—Master in the Royal Navy, Her Majesty's Ship "Urgent," Portsmouth.—July 6th, 1859.—24 years.—I do not.—1. English Channel, Gibraltar, Malta, Sierra Leone, and Ionian Islands.—2. Coast of Africa (west), Pacific, and nearly all parts of the Mediterranean. R.N.
669. **JAMES B. KENNEDY.**—Master of the "Medway," 101, Douglas Street, Deptford.—27th July, 1859.—30 years.—Ship "Medway," Scarborough, 653 tons, in the West India Dock.—1. The English Channel, from the Downs to Scilly; Ceylon, from Trincomalee round south to Colombo; the Malabar coast; Australia, from Portland Bay to Melbourne; and through Bass Straits.—2. The Brazil coast, from Cape St. Roque to the River St. Francisco. M.
670. **F. S. READ.**—Master in the Royal Navy, in charge of Admiralty Survey, Cape of Good Hope.—14th June, 1859.—21 years. R.N.
671. **JOSUCA TAYLOR.**—Master, Royal Navy, Her Majesty's Ship "Andromache," Powder Depot, Milford Haven.—I think about 33 years.—No.—1. Practically with the Port of Plymouth, Spithead, Sheerness, the Downs, Milford Haven, also Malta, Corfu, the Cape of Good Hope, and Mauritius.—2. Practically with the coast of Brazil, the River Plate, and Mozambique Channel. R.N.
672. **HERBERT R. CROSS.**—Master of said vessel, 42, John's Hill, Waterford.—July 11th, 1859.—Milford Haven.—18 years.—Steamer "Courier," of London, 374 tons, 150 horse power.—1. Yes, south coast of England, south-east coast of Ireland, portion of coast of South Wales; in the Colonies, the Australian coasts generally.—2. Not intimately; I may mention, however, Malabar coast and that of west of South America. M.
673. **DAVID B. KERR.**—Master, Neyland.—July 11th, 1859.—Milford Haven.—26 years.—Steamship "Leipery," of London, 578 tons, 250 horse power.—1. Yes, the south coast of England, the south of Ireland, the north coast of Ireland, and part of the west coast of England and Wales.—2. None. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 674. JAMES PENN.—Master Her Majesty's Ship "Queen Charlotte," Sheerness.—7th July, 1859.—About 30 years, but nearly always on a foreign station.—No.—1. South coast of England.—2. South coast of Spain and the Mediterranean generally.
- R.N. 675. HENRY BICHOAT.—Master of Her Majesty's Ship "Casar."—July 8th, 1859.—32 years.—At present Master of Her Majesty's Ship "Casar," 400 horse power.—1. Yes, round the world.—2. All parts of the world.
- R.N. 676. HENRY VANE.—Assistant Master Attendant, Her Majesty's Dockyard, Devonport.—8th July, 1859.—34 years.—Master in Her Majesty's Navy.—1. Well acquainted with the coast of England, limited knowledge of the Colonies.—2. Having served in all parts of the universe, have a general knowledge of the different coasts, but more particularly the coast of Africa and South Pacific.
- M. 677. Captain EVAN EVANS.—Smack "Halcyon," Skinner Street, Carnarvon, North Wales.—July 8th, 1859.—55 years.—Master of the Smack "Halcyon," of Carnarvon, 47 tons register, new measurement.—1. I am, in St. George's, Bristol, and the English Channels, and round Ireland.
- R.N. 678. JOHN HUTCHINGS.—Master, Royal Navy, Her Majesty's Ship "Minotaur."—30 years.—1. No.—2. No.
- R.N. 679. GEORGE GILES.—Master Her Majesty's Ship "Edgar," Sheerness.—24 years.—Master, Royal Navy.—1. The Downs, Portsmouth, Portland, Dartmouth, Brixham, Plymouth, and Falmouth.—2. West coast of South America, coast of Africa, Caribbean Sea, Gulf of Florida, Cattegat, Baltic, Gulf of Finland, north and south coasts of China.
- R.N. 680. H. E. RANEYS.—Master, Royal Navy, in charge of Her Majesty's Ship "Royal George," Devonport.—July 10th, 1859.—31 years.—1. Not well acquainted, but have a general knowledge of the south coast of England, the Cape of Good Hope, North American and West Indian Stations.—2. Not sufficiently acquainted with any to give a decided opinion on the manner in which they are buoyed or lighted.
- M. 681. JOHN METCALF.—Master of "Queen" Steamer, No. 5, Wellington Row, Whitehaven.—13th July, 1859.—34 years.—"Queen" Steamer, 242 tons, Whitehaven, 180 horse power.
- R.N. 682. GEORGE S. ALLDRICKS.—Master, Her Majesty's Ship "Scout," Sheerness.—8th July, 1859.
- R.N. 683. CHARLES GAHAN.—Master Her Majesty's Ship "Queen Charlotte," for service in "Mars," Sheerness.—40 years nearly.—1. The English Channel, south-west coast of Ireland, West Indies, Bay of Fundy, and coast to Halifax.—2. Coast of Portugal, and the different rivers.
- R.N. 684. H. T. ELLIS.—Master, Royal Navy, Her Majesty's Ship "Majestic," Sheerness.—July 20th, 1859.—Have been at sea pretty constantly for the last 24 years, but not much where there were many buoys or lights.—1. Had some experience on the coasts of Australia 14 or 15 years ago, and more recently at the Cape of Good Hope.—2. Tolerably well acquainted with the west coast of Africa.
- R.N. 685. T. C. PULLERY.—Master, commanding Her Majesty's Steam Vessel "Dee," Woolwich.—Her Majesty's Steam Vessel "Dec," Woolwich, 13th July, 1859.—30 years.—Her Majesty's Steam Vessel "Dec."—1. River Thames, below Woolwich, to the North Foreland, from the North Foreland to the Land's End, and from the Land's End to Milford Haven.—2. Coast of Africa, West Indies, north-east and south-east coast of America, East Indian and China station.
- M. 686. W. H. ETARHY.—Master, India trade, 128, Warwick Street, Toxteth Park, Liverpool.—4th July, 1859, at sea, Bristol Channel, bound to Madras.—11th April, 1830, to July, 1859, 29 years, Master 16 years.—"Nell Gwyn," 938 tons, Bridgewater Ship.—1. Almost every part of the United Kingdom.—2. Cronstadt to the Scaw, south coast of Norway and Sweden, north coast of France, Portugal, Spain, the whole Mediterranean, Boston, South Carolina, the whole coasts of India, China partially, Sunda Straits, &c.
- R.N. 687. F. R. WUNDER.—Master, in command of Her Majesty's Ship "Rhadamanthus," 820 tons, and 220 horse power.—1. Yes, from Land's End to North Foreland.—2. Yes, having served in the Mediterranean seven or eight years, and on the coast of Africa between 16 and 17 years.
- R.N. 688. T. B. HENWOOD.—Master Her Majesty's Ship "Amphin."—July 8th, 1859.—23 years.—Not had any command other than Master in the Royal Navy.—1. Not particularly, have a knowledge of the English and Irish Channels.—2. Acquainted with the South American coast.
- R.N. 689. WILLIAM JOHNSTON.—Master Her Majesty's Ship "Pigmy."—July 7th, 1859.—30 years.—Her Majesty's Ship "Pigmy."—1. Southern coast of England.
- R.N. 690. THOMAS POTTER.—Master, Royal Navy, Her Majesty's Ship "Termagant," Plymouth Sound.—July 9th, 1859.—23 years.—"Pigmy" and "Adder," Tenders, 100 horse power, Chatham.—1. Entrance of the English Channel to the Thames, Cape of Good Hope to the Buffalo, West Indies, Channel Islands.—2. Mediterranean, Black Sea, South-east coast of America, coast of Mexico, Yucatan, Portugal, and Spain.
- M. 691. JOHN LEITCH.—Master, Royal Mail Ship "Europa," No. 14 Water Street, Liverpool.—28 years.—Royal Mail Ship "Europa," 1,208 tons register, belonging to Glasgow, 640 horse power.—1. Yes, Ireland, south of Newfoundland, Nova Scotia, and from Smalls to Liverpool.—2. Bay of Massachusetts, United States.
- R.N. 692. B. B. STUART.—Master, Royal Navy, Her Majesty's Ship "Virago."—July 26th, 1859.—24 years.—1. The English coast from Land's End to North Foreland.—2. Coast of Brazil from Cape Frio to Rio de Janeiro.
- M. 693. C. B. DAVIS.—12, King William Street, E.C.—I have been at sea for 35 years.—I am Master of the Brig "Eclipse," 223 tons, "Madura" Packet, and have been in that trade 25 years.—1. Yes, the English Channel.—2. No.
- R.N. 694. J. TUCKER.—Master Her Majesty's Ship "Wellington," Devonport.—33 years.—1. I am generally acquainted with the south coast of England and Ireland, and the West Indies.—2. Generally acquainted, but not sufficiently so as to give a decided opinion on their lights.
- R.N. 695. WILLIAM MILLS.—Master Her Majesty's Ship "Forte," Sheerness.—July 13th, 1859.—In the Navy 31 years, actively at sea 20.—"Adventure," Naval Transport.—1. Pretty well with the south coast of England, having commanded the "Adventure," Naval Transport, for two years.—2. With the Indian Sea, having served on that and the Australian stations for seven years.
- R.N. 696. GEORGE RAYMOND.—Master Her Majesty's Ship "Liffey," Plymouth Sound.—9th July, 1859.—23 years.—1. I am well acquainted with the coast of England from the North Foreland to Land's End and up to Liverpool, and all the coast of Ireland, also Hong Kong, Singapore, and Sierra Leone.—2. West and east coast of Africa, India and China, Red Sea, coast of Japan, Gulf of Tartary, Kamtschatka, west and east coast of South America, Gulf of Siam, and St. John's, Newfoundland.
- R.N. 697. EDWIN ROWE.—Master Her Majesty's Ship "Donegal."—July 7th, 1859.—26 years, 10 years of which in the Mercantile Service.—At present in Her Majesty's Ship "Donegal."—1. Yes, with English coast, and partly with Irish and Welsh coast or St. George's Channel.—2. Pacific, Brazils, New Zealand, and Van Diemen's Land, &c.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

698. JOHN T. C. WEBB.—Master, Royal Navy, Her Majesty's Ship "Renard," Sheerness.—9th July, 1859.—June, 1846.—1. Yes, English Channel, Gambia, Sierra Leone, and Cape of Good Hope.—2. East and west coast of Africa and Baltic. R.N.
699. GEORGE BIDDLECOMBE.—Assistant Master Attendant, Kybar Yard, Devonport.—7th July, 1859.—About 36 years.—Master in the Navy.—1. The coasts of England and Ireland, especially the English Channel, also the West Indies.—2. The Baltic, French, Spanish, and Portuguese coasts. R.N.
700. B. J. HOOPER.—Master Her Majesty's Ship "Trafalgar," Sheerness.—29 years.—1. The parts of the coast of England are the English Channel only, and that to the westward of the Wight; I have only been once east of the Wight; Colonies, not at all.—2. My visits to foreign coasts have been very partial; China I was longest on, which was very imperfectly surveyed; the Mediterranean east of Malta. R.N.
701. W. S. BOURCHIER.—Master Her Majesty's Steam Tender "Myrtle," Sheerness.—At sea for 13 years, and in a tender, harbour service for 9 years.—Her Majesty's Steam Tender "Myrtle," Sheerness, 116 tons, 50 horse power.—1. English Channel and mouths of rivers Thames and Medway.—2. South America, east coast, and Mediterranean slightly. R.N.
702. W. G. S. HALL.—Master, 6, Lee Place, Lewisham, Kent.—17th July, 1859.—26 years.—"Gibraltar," of London, 669 tons, 110 horse power.—1. British Channel.—2. Coast of Spain and Portugal from Cape Ortegal to Gibraltar. M.
703. EDWARD MAUNDER.—Master, Royal Navy, Her Majesty's Steam Frigate "Curacoa."—32 years.—Master, R.N.—1. The coast of England from the Land's End to the Downs.—2. The North and White seas, West Indies, south-east coast of America, Mediterranean, and south-west coast of Ireland. R.N.
704. J. BROWN.—Master Attendant, New Dockyard, Devonport.—7th July, 1859.—38 years.—Master in Her Majesty's Navy.—1. I am well acquainted with the coast of England, partly of the coast of Ireland and Scotland, also the Cape Colony.—2. Not particularly more than the general observations of a seaman who has navigated ships in almost all parts of the world. R.N.
705. GEORGE BROCKMAN.—Master, Royal Navy, commanding Her Majesty's Steam Vessel "Wildfire," Sheerness.—4 years on foreign stations, from 1838 to 1842, 17 years on home stations.—Her Majesty's Steam Vessel "Wildfire," tonnage, 182; horse power, 76.—1. Land's End, Cornwall, to Dundee.—2. No. R.N.
706. MARK HETTON.—Master, Her Majesty's Ship "Cossack," Sheerness.—19 years.—1. No.—2. West Indies, coast of Africa, Brazil. R.N.
707. JOHN McDONALD.—Master Attendant, Her Majesty's Dockyard, Woolwich.—July 12th, 1859.—35 years.—Master, Royal Navy.—1. The English Channel only in making passages from port to port.—2. No. R.N.
708. WILLIAM LUCOCK.—Master, No. 53, Savile Street, South Shields.—2d July, 1859.—21 years.—"Thomas and Mary," 265 tons, South Shields.—1. East coast of England, North Sea.—2. From the Texel on the coast of Holland eastward to the entrance of the Elbe, and northward to the Horn Reef on the Jutland coast. M.
709. H. W. ALLEN.—Master, commanding Her Majesty's Ship "Vivid," Woolwich.—8th August, 1859.—42 years.—Her Majesty's Ship "Vivid," 160 horse power.—1. The English and St. George's Channels and North Sea.—2. France, Holland, and Belgium. R.N.
710. JOHN WILLIAMS.—Her Majesty's Ship "Elbana," Holyhead.—For upwards of 40 years; for 35 years commanded steamers.—I command the Royal Mail Steamer "Elbana," belonging to the City of Dublin Company, registered in Dublin, 303 tons, and 380 horse power.—1. Well acquainted about Liverpool, Holyhead, and the Irish coast.—2. No. R.N.
711. EDWARD KEANE.—Commander, Royal Navy, Holyhead.—July 1st, 1859.—I entered Her Majesty's Navy in 1806.—I command the Royal Mail Steamer "Llewellyn," belonging to the City of Dublin Company, lately belonging to the Government, 400 horse power.—I have commanded Government and Contract Mail Packets in the Irish Channel the last 20 years.—1. Well acquainted about Dublin Bay and about Holyhead, and the coast to Liverpool.—2. No. R.N.
712. RICHARD WILLIAMS.—Master Mariner, 6, Stanley Terrace, Holyhead.—July 1st, 1859.—From October 1834 up to the present date, say 26 years.—I command the Royal Mail Steam Packet "Prince Arthur," between Holyhead and Kingstown; tonnage 203; horse power, 226.—1. Have considerable experience in the English, North, and St. George's Channels. M.
713. W. WILLIAMS.—74, Oxford Place, Liverpool, commander of the "Windsor."—June 8th 1859.—44 years.—"Windsor" Steam Ship, of Dublin, belonging to the City of Dublin Company; register, 511; horse power, 345.—1. Liverpool, Falmouth, Plymouth, Portsmouth, Southampton, and from hence to London, Dublin, Belfast, Cork, and Glasgow. M.
714. H. W. GEARY.—Commander, No. 5, New Comin Place, Dublin.—June 18th, 1859.—30 years.—Steam Ship "Trafalgar," of 365 tons, and 360 horse power, City of Dublin Steam Company.—1. Coast of Great Britain and Ireland. M.
715. RICHARD S. TRIPHOCK.—Commanding "Iron Duke" Steamer, City of Dublin Company, Clarence Dock Office, Liverpool.—18th May, 1859.—3 years apprentice between Shields and London, 4 years mate of a ship in the Mediterranean and West Indies, 30 years in the revenue cruisers in the United Kingdom, and 7 years in steamers principally between Kingstown and Liverpool.—"Iron Duke" Steamer, 385 tons register, Dublin, 325 horse power.—1. Well acquainted with the whole of the coast of Ireland, part of the west coast of Scotland, and from Portsmouth to the Land's End.—2. Not well acquainted, not being foreign for the last 36 years. M.
716. JOHN TAYLOR.—Master, 1, Bedford Place, Booth.—July 7th, 1859.—4 years apprentice, in all, 23 years.—"Duchess of Kent" Steam Ship, City of Dublin Company, 217 tons register, 250 horse power.—1. I am; from Liverpool to London, round the coast of Ireland.—2. Nil. M.
717. ROBERT ROBERTS.—Master in the City of Dublin Steam Packet Company, Liverpool, 5, Phenix Terrace, Bootle.—June 8th, 1859.—I have been in merchant service since 1816.—"Duke of Cambridge" Steam Packet, tonnage, 265; port of register, "Dublin," 220 horse power.—1. Acquainted between Liverpool and Dublin and Belfast and Dublin.—2. No. M.
718. THOMAS DAVIES.—Master.—8th June, 1859.—54 years, home and foreign.—"Prince of Wales," 206 tons, port of Dublin, 200 horse power.—1. Belfast, Dublin, Liverpool, Bangor, Beaumaris, and Carnarvon, all in the United Kingdom.—2. No. M.
719. THOMAS REYNOLDS.—Master Mariner, 272 Derby Road, Bootle, near Liverpool.—June 11th, 1859.—25 years.—"Birmingham," 225 tons, 120 horse power.—1. Coast between Liverpool, Dublin, and Belfast.—2. None. M.
720. JOHN GRIFFITHS.—Master Mariner, City of Dublin Steam Packet Company, Liverpool.—June 8th, 1859.—Yes, 35 years.—"Prince" Steam Ship, 270 horse power, 303 tons register.—1. Yes; St. George's Channel, English Channel, and round Ireland and Scotland.—2. No. M.

Questions 35, 36, 33, 34, 1, 2.—*continued.*

- M. 721. THOMAS DEARL.—Master, plying between Liverpool and Dublin. Bath Avenue, London Road, Dublin.—8th June, 1859.—44 years.—“Royal William” Steamer, register tonnage, 282; port of Register, Dublin; horse power, 270.—1. The St. George’s Channel and English Channel.—2. Flanders, France, and Channel Islands, Peninsula coast, viz., Vigo, Oporto, Lisbon, Cadiz, and Gibraltar.
- M. 722. RICHARD WILLIAMS.—Master, City of Dublin Steam Packet Company, Liverpool.—June 10th, 1859.—52 years.—“Princess” Steamer, 292 tons register, port of Dublin, 260 horse power.—1. Well acquainted all round the coast of England and Ireland.—2. Not with any.
- M. 723. D. FAIRFIELD.—Lieutenant Royal Navy, Marine Superintendent for the City of Dublin Steam Packet Company, Liverpool.—June 8th, 1859.—1 have served in the Royal Navy and merchant service since 1804, commanded several mail packets and others during 25 years.—1. Acquainted between Liverpool and Dublin.—2. None.
- R.N. 724. JOHN TULLY.—Lieutenant Royal Navy, at present Superintendent of Mail Packets, Holyhead.—July 7th, 1859.—About 20 years, 12 of which in Her Majesty’s service.—A steamer, the “Shamrock,” between Liverpool, Dublin, and Belfast.—1. Well acquainted with the English Channel and Irish Channel and Liverpool.—2. Was well acquainted with the coast of North America at one time, also the North Sea.
725. JOHN BEATTON.—Agent, National Bank of Scotland, Stromness, and Vice-Consul for Denmark.—August 2d, 1859.—Never.—1. Am acquainted with that part of the coast in the vicinity of Stromness, county of Orkney.—2. Not acquainted with any foreign coasts.
- Y. 726. SIR JOHN WALSH.—28, Berkeley Square, London.—June 27th, 1859.—I have been in the habit of yachting for upwards of 20 years, and have been navigating our own seas every year.—I have been the proprietor of the “Amazon,” Royal Yacht Steamer.—1. I am well acquainted with the English and Irish (St. George’s) Channels, and with the north-west coast of Scotland.—2. With the north coast of France.
- M. 727. EDWIN ANDERSON.—Master, “Reante,” Market Square, Dartmouth.—June 27th, 1859.—Served at sea 15 years.—“Ryauto,” 152, Plymouth.—1. The English, British, and St. George’s Channels.—2. The coast of Portugal, Spain, Mediterranean Sea, Archipelago, and islands of the Levant.
- M. 728. JAMES POOLE.—Master Mariner, “St. Floro,” 9, Anglesea Place, Durham Down, near Bristol.—25 years.—Steam Vessel “Flora,” Bristol, 700 tons, 350 horse power.—1. Bristol Channel, English Channel, Irish Channel, Malabar Coast, Straits of Malacca and Singapore, Bay of Bengal, West Coast.—2. Coasts of Spain and Portugal, African coast, French coast from Marseilles to Straits of Bonifacio, coast of Sicily from Island of Maritimo, Black Sea.
- M. 729. R. W. EVANS.—Commanding “Ceylon,” Woolston, Southampton.—25 years.—Peninsular and Oriental Steam Ship “Ceylon,” 2,400 tons, London, 450 horse power.—1. The English and Irish Channels.—2. Spain and Portugal, the Mediterranean and Black Seas, Bay of Bengal, Arabian and Red Seas.
730. JOHN H. RIDLEY.—Marine Surveyor, Garraway’s, City.—About 30 years.—I have not been at sea since 1854, but have commanded vessels since 1836.—1. I am not very well acquainted with any particular parts of the United Kingdom or colonies, but know most about the east and south coast of England.—2. I am not well acquainted with any foreign coasts, but know most about the Mediterranean, Black, and Azoff Seas, the Baltic, and coasts near the River Plate.
- M. 731. RICHARD CHEW.—Master Mariner, 104, Cogan Street, Hull.—Dundee, Scotland, 30th June, 1859.—27 years.—“Grimsby” Steam Ship, of Grimsby, 442 tons, 100 horse power.
- R.N. 732. F. WOOLLEY.—2, Washington Terrace, Southampton.—June 29th, 1859.—25 years.—H.M.S. “Atrato,” 3,400 tons, Southampton, 750 horse power.—1. English Channel and West Indies.—2. Spain and Portugal.
- R.N. 733. GEORGE RICHARDS.—Portsmouth.—July 5th, 1859.—20 years.—Master H.M.S. “Sidon.”—1. Yes, the British Channel and Channel Islands.—2. The coast of France adjacent to Channel Islands.
- P. 734. JOHN JONES.—Pilot, H.M. Dockyard, Portsmouth.
- M. 735. WM. GILHAM.—Master and part Owner, Plumblands Lane, Whitehaven, Cumberland.—Jamaica, 25th July, 1859.—6 years, whalership.—“Calista,” 187, Jersey.—1. St. George’s Channel, south-east and east coast of Ireland; also English Channel, West Indies, Honduras, New Zealand and south coast of Australia, Banks’ and Bass’ Straits.—2. Patagonian, Chilean, Peruvian, Brazilian, and parts American.
736. THOS. H. EMESON.—Acting Superintendent, Peninsular and Oriental Company, Calcutta.—June 26th, 1859.—I have served 24 years at sea.—1. No.—2. I am acquainted with those portions of the coasts of Asia and Africa sighted by steam ships trading between Calcutta and Suez.
- P. 737. W. LAMASTER.—Master Pilot, Bootle, near Liverpool.—August 16th, 1859.—44 years.—“The Liver,” Pilot Boat, No. 9, 60 tons.—1. From Anglesea round Liverpool Bay to Whitehaven, Isle of Man, west coast of Scotland.
- M. 738. J. W. FERGUSON.—17, Union Street, Deptford.—5th September, 1859.—I have served at sea 34 years, as apprentice, mate, and master in the home and foreign trades.—“Clarence” Steam Ship, of London, 426 tons register, and 240 horse power; builders’ measurement, 780 tons.—1. I am acquainted with the east coast of Britain, and the island of Jamaica in the West Indies.—2. Pretty well acquainted with the north coast of France and Holland, and somewhat with the entrance of the River Elbe.
- M. 739. JOHN KEER.—Master Mariner, 10, Lawrence Street, Sunderland, October 6th, 1859.—30 years.—“Evadore,” 460, Newcastle.—1. East coast of England.
- P. 740. DAVID REID.—Licensed North Sea and Baltic Pilot, 46, Addison Street, Sunderland.—42 years.—11 years apprentice and mate; 25 years master; 2 years pilot, Baltic expedition; 4 years pilot coasting.—1. I am acquainted on the east coast.—2. In the Baltic.
- P. 741. JOHN NEEDHAM.—North Sea Pilot, 39, Hamilton Street, Monkwearmouth Shore, Sunderland.—October 10th, 1859.—42 years.—Different vessels and tonnage during that period belonging to the port of Sunderland.—1. East coast of England.—2. No.
- M. 742. MATTHEW WILSON HINGTHAUGH.—Master Mariner, 14, East Street, Sunderland, October 7th, 1859.—34 years at sea; master of sailing vessels this last 20 years.—No vessel at present.—1. East coast, and English Channel.—2. Bay of Biscay, French coast.
- R.N. 743. JOHN HARDING.—Living retired, half pay, on a small farm, French Fort, Commander R.N., Oranmore.—October 6th, 1859.—In the Royal Navy about 30 years, actively employed afloat.—1. Coast Donegal; Dublin Bay, coasts adjacent; Wexford, Wicklow, Skerries, and Galway coasts; New Brunswick Point, Nova Scotia.—2. I was formerly in different parts foreign.
- M. 744. GEORGE CHARLES BURNE.—Now commanding the under-named ship, on a voyage between Bombay and Hong Kong and back, with cargo, passengers, and H.M.’s Mails.—Fenang, June, 1859.—14 years and 8 months actual service, commencing in 1843.—The Peninsular and Oriental Steam Navigation Company’s Steam Ship “Pekin,” (paddle), of 1,182 tons (759 registered), and 400 horse power, of the Port of London.—1 and 2. I do not consider myself sufficiently well acquainted with the coasts indicated in the majority of these questions to give a confident and knowledgeable answer to them, or at least such an answer as I could conscientiously consider deserving of weight in the consideration of the subject by the Commissioners, or calculated to be of real use in assisting them to form conclusions; and this principally because since I have held command I have been employed solely in the

Questions 35, 36, 33, 34, 1, 2.—*continued.*

Indian, China, Arabian, and Red Seas, whose coasts, wherever not in British possession, are not lighted at all, or so feebly as to be unworthy of notice, and therefore do not come within the scope of these interrogatories. And because as a general rule,—as I am convinced, both by observation of others, and personal consciousness,—the experience and judgment required to form an opinion of any value in matters of this kind are only acquired through the operation of the sense of responsibility and anxious care induced by the sole charge and navigation of a ship devolving upon a commander, and not in any subordinate position. I have, therefore, answered only such questions, wherein I am able to give any, as are of quite general nature and application.

745. ROBERT THOMAS DUNDAS.—Running between Bombay and Suez, and Bombay and China; present address, to the care of Peninsular and Oriental Company's Agent, Bombay.—Bombay, 27th August, 1859.—I have served 20 years at sea.—I command the Peninsular and Oriental Company's Steam Ship "Norma," of London, 970 tons, 220 horse power.—1. I know the English Channel very well, the Irish Channel pretty well, but very little about the colonies.—2. I know the French coast from the Caskets to Ushant and Ste. de Sein; also from Marseilles to Cape Camarat; also from the Spanish and Portuguese coasts from Corunna to Valencia; also Corsica and Sardinia, and the shores of the Mediterranean. M.
746. PETER MARSHALL.—Master Mariner, 31, Dock Street, Monkwearmouth, Sunderland.—21 years.—"Hetton," 334 tons, of Sunderland, 75 horse power.—1. The east coast of England.—2. No. M.
747. WALTER SMITH.—London and South-western Railway Company's Offices, Southampton.—35 years.—The "Hayre," 200 tons, 225 horse power.—1. and 2. The last 20 years I have been employed in running between Southampton and Hayre, in France, and occasionally to the Channel Islands. M.
748. ROBERT PHILLIPS.—Southwold, Suffolk.—30 years.—"Joseph Shepherd," of London, 630 tons.—1. Am well acquainted with the English, Bristol, and St. George's Channel, and have been to Sydney and New Zealand.—2. Am well acquainted with the United States, Brazils, and ports on the west coast of America. M.
749. GEORGE BABOR.—3, Richmond Terrace, Southampton.—45 years.—"Dispatch," Southampton, 200 horse power.—1. Portland to the Owers.—2. Cape le Heve to Cape Frehel, France. M.
750. G. BENTINEK.—Davies Street, Berkeley Square.—I have been continually at sea since 1823.—Royal Yacht Steamer "Deacon" (Yacht), 184 tons, Portsmouth.—1. The coast of the United Kingdom generally.—2. France, Spain, Portugal, and the Mediterranean. Y.
751. WILLIAM HOLLAND WARREN.—Commanding Steam Ship "Telegraph," Hibernia Terrace, Holyhead.—November 11th, 1859.—31 years.—"Telegraph," Chester, 374 tons, 468 horse power.—1. North Sea, from Shields and upwards; English Channel, for which I am a qualified master and pilot in the Royal Navy; St. George's Channel, particularly Liverpool, Menai Straits, Dublin Bay, and Cork Harbour.—2. Coast of Brazils, West India Islands, and Mediterranean throughout. M.
752. WILLIAM CURLING.—Commanding "Candia," Galle, Calcutta, October 4th, 1859.—20 years.—Peninsular and Oriental Company's Steam Ship "Candia," 2,000 tons, Calcutta to Suez.—1. The Channel.—2. No. M.
753. HENRY C. CHAPMAN.—Agent for Lloyd's, Liverpool.—Liverpool, August 23d, 1859. M.
754. E. C. MACLEOD.—Commander of American Ship "Georgia."—I have served constantly at sea since 1830.—Command the Ship "Georgia," of Savannah, of 1,035 tons register.—1. A 4½ years' acquaintance with the south coast of Ireland and St. George's Channel, regularly in the trade between Savannah and Liverpool.—2. Not particularly well, having changed frequently to different ports. F.M.
755. ELI PERRY.—Captain, Bath, Maine.—27 years.—Ship "Cambria," 1,200 tons, Bath, United States.—1. Yes; all around the coast.—2. Yes; Russia, Prussia, Sweden, Denmark, Norway, Germany, France, Spain, Portugal, East Indies, West Indies. F.M.
756. GEORGE M. MELCHER.—Master, Ship "C. S. Pennell," United States.—33 years.—"Charles S. Pennell," 1,000 tons, Brunswick.—1. Not at all.—2. I am well acquainted with the United States of America. F.M.
757. JAMES C. STEVENSON.—Chemical Manufacturer, South Shields, one of the Tyne Improvement Commissioners. M.
758. WM. STANTON.—Singapore.—August 12th, 1859.—Nearly 18 years.—Master commanding I.M. Surveying Brig "Saracen," 232 tons.—1. East coast of England, south-east coast of Ireland, west coast of Scotland, and British Channel.—2. Pacific, North America, Baltic, Mediterranean, Black Sea, Spain, Portugal, and Indian Archipelago. R.N.
759. JAMES GOODBRIDGE.—Commander. "Courier," Oakland Cottage, Woolston, Southampton.—36 years.—"Courier" Mail Packet, total tonnage about 400, and 200 horse power.—1. British Channel, Channel Islands, Gibraltar, and Malta.—2. France, Spain, and Portugal, Havre, Cherbourg, Granville, St. Malo, Brest, Corunna, Vigo, Oporto, Lisbon, Cadiz, Malaga, Bilbao. M.
760. TIMOTHY GORMAN.—Henry Street, Limerick.—Limerick, November 9th, 1859.—I have been 52 years at sea, 41 as master.—The Ship "Jane Black," of Limerick, 579 tons register, was the last that I commanded.—1. I am well acquainted with the English and St. George's Channels, and the coast of Ireland, Valso, the coast of Newfoundland, the Gulf and River St. Lawrence, Straits of Belisle, &c.—2. I am not much acquainted with foreign coasts. M.
761. JOHN WALKER.—Civil Engineer, some years Member of the Royal W. Yacht Club, Lumelone Ferragh, Carlow.—August 25th, 1859.—1. I have had a reasonably good landsman's knowledge and experience of the Irish coast from Dublin round to Cork Harbour, more particularly of Dublin, Wicklow, Carne, Waterford, and Dunganon, also of the Shannon, Foynes Harbour, and other places. Y.
762. W. F. NOIRE.—Commander, Peninsular and Oriental Company's Service, Hong Kong, July 19th, 1853.—18 years.—"Rajah" Steam Ship, 530 tons, London, 80 horse power.—1. Not well, having been employed on foreign stations for 13 years, and when sailing out of England not having been in command.—2. Coast of China, coasts of India, and Malacca Straits. M.
763. GEORGE BROWN.—Commander, Peninsular and Oriental Steam Navigation Company's Office, 122, Leadenhall Street.—Bombay, July 13th, 1859.—21 years.—"Haddington," 1,460 tons, of London.—1. I am well acquainted with the coast between Melbourne and Sydney.—2. Also between Lizard and Dungeness, on the English coast, and the Malabar and Coromandel coasts between Bombay and Calcutta. M.
764. E. HORE.—Commander.—Gorey, Jersey, November 17th, 1859.—22 years.—H.M.S. "Dasher," 240 tons, 100 horse power.—1. The south coast of England and Channel Islands.—2. The French coast in the vicinity of the Channel Islands. R.N.
765. THOMAS PARRY.—Master Pilot, 18, Stafford Street.—September 20th, 1859.—33 years.—"Pioneer," Liverpool Pilot Boat, 84 tons.—1. The coasts of Wales, Lancashire, and Cumberland, Isle of Man.—2. No. P.
766. D. G. MUNRO.—Commander, Peninsular and Oriental Steam Navigation Company, Indian Station.—Steam Ship "Emeu," Aden, August 3d, 1859.—Active service since 1827.—Peninsular and Oriental Steam Ship "Emeu," 1,538 tons, 350 horse power.—1. English Channel, Ushant to the Downs.—2. Bins Straits, east coast Australia, China Sea, or from Singapore to Hong Kong, Formosa Channel, east coast of China, ports of Amoy, and Chusan Group, Yangtse Kiang River to Woosung, Bay of Bengal, New Zealand (North Island), Cook's Straits. M.
767. ALEX. B. FARQUHAR.—Commander, Steam Ship "Nubia," Peninsular and Oriental Company, Calcutta, July 5th, 1859.—18 years.—Peninsular and Oriental Steam Ship "Nubia," 2,000 tons, of London, 460 horse power.—

Questions 35, 36, 33, 34, 1, 2.—*continued.*

1. Coromandel and Ceylon coasts.—2. North-east and north coast of Africa, south-east coast of Arabia, east and west coast of Red Sea.

- R.N. 768. JAMES TONKIN.—Master Attendant and Queen's Harbourmaster, Portsmouth.—August 12th, 1859.—39 years.
- P. 769. JOHN R. BELL.—Channel Pilot for the St. George's Channel, not having any command.—54. Cresswell Street, Liverpool.—I have been at sea 34 years.—Since my apprenticeship at Shields I have had the command of steamers for 24 years in the St. George's Channel and Bristol Channel.
- M. 770. CHARLES GRANGER WELLS.—Commanding the under-named ship, Southampton.—31 years.—“La Platu,” of London, 2,500, 1,000 horse power, from Southampton to West Indies.—1. Yes; from Scilly to Downs, and in the Colonies, the West Indies and East Indies.—2. No; my services having been for upwards of 20 years in the East Indies, and the last 10 years in the West Indies.
- M. 771. EDWARD COOPER.—Commanding the “Simla,” Calcutta to Suez Line.—Suez, September 5th, 1859.—Served at sea 40 years.—Peninsular and Oriental Steam Ship “Simla,” 2,440 tons, registered in London, 650 horse power.—1. I am acquainted with the south-west coast of England, south coast of Scotland, east coast of Ireland, all the south and east coast of Australia, India, Ceylon, British America, Nova Scotia, and Newfoundland.—2. Yes; nearly all parts of the Mediterranean, France, Spain, Portugal, Grecian Archipelago, Sea of Marmora, Bosphorus, Black Sea, Red Sea, China Sea, Straits of Malacca.
- M. 772. JOHN BAWEN.—Commanding Steam Ship “Ganges,” residence, Seaton Lodge, Tardea, Bombay.—Penang, August 12th, 1859.—I have served at sea from 1822.—I have commanded vessels to nearly all parts of the world; the last 11½ years in command of the Peninsular and Oriental Company.—1. I had a very general knowledge of the coasts of the United Kingdom, but have been in India the last 6 years.—2. I am acquainted with Red Sea, India and China coasts.
- R.N. 773. JOHN HAY.—Commander, R.N., 2, Bevon Hill Terrace, Southampton.—With trifling exceptions, 45 years.—I have commanded a Revenue Cruiser and a Royal Yacht, served in small ships of war, and latterly (11 years) as agent in charge of mails going to Mediterranean, Lisbon, West Indies, Brazil. My experience of the channel is based upon more than 20 years of coasting, and I have published a work on the subject, now in 4th edition.—1. With the western coast of England, and West Indian Colonies.—2. Western coast of France, coasts of Spain and Portugal, Mediterranean, West Indies, Gulf of Mexico.
- P. 774. JOHN FREDRICK.—North Sea Pilot, No. 16, Pemberton Street, Sunderland.—September 24th, 1859.—Apprentice 7, Seaman 5, Mate 11, Master 21, North Sea Pilot 3; 47 years. 1. East coast of England.—2. No.
- M. 775. DAVID McKECHNIE.—Shipmaster, Seaford Road, Dundee.—I have been 18 years at sea.—I command the Brig “Mary Read,” 102 tons, of Dundee.—1. I am well acquainted with that part of the east coast of the United Kingdom that lies between Flamborough Head and Aberdeen.
Annexed to the above Answers by Mr. McKechnie (775) is the following: “I have considered the questions in “this paper, and I agree with the answers given.—ROBERT GIBB, Shipmaster, 5, Castle Court, Dundee; “Dundee, September 10th, 1859.”
- P. 776. JAMES CRUTE.—North Sea Pilot, 7, Henry Street, Sunderland.—September 12th, 1859.—31 years; (viz.) Apprentice 4 years, Mate 5 years, Master 15 years, Pilot 7 years.—1. I am particularly acquainted with east coast of England and Scotland, North Sea.—2. No.
- M. 777. JOSEPH SCOTT.—Maiden Street, Peterhead.—I have served 39 years, 29 of which I have been in command of different vessels; 1 command at present the Barque “Kate,” of 266 tons.—1. I have a general knowledge of most parts of the coast of the United Kingdom.—2. I am acquainted with coast of Brazil, all the west coast of America, and from Cape of Good Hope to Calcutta, Mediterranean, and Baltic, &c. &c.
- P. 778. JOHN WILSON.—North Sea and Baltic Trinity Pilot, 30, Dame Dorothy Street, Monkwearmouth Shore, Sunderland.—September 19th, 1859.—34 years.—“Lowther,” 340 tons, Newcastle-on-Tyne, “Jourteen,” 349 tons, Newcastle-on-Tyne.—1. Round all the island.—2. All the Baltic.
- P. 779. WILLIAM PALMER.—Pilot, Poole.—October 5th, 1859.—Nine years, A. B.; five years, “Newhope,” Poole, 40 tons.—1. British Channel.
- M. 780. JOHN MACLEAN.—Agent for Lloyd's, &c. &c. for Islay, Jura, and Colonsay.—1. Having been agent for the underwriters at Islay, Jura, and Colonsay, in Argyshire for the last 42 years, I have acquired a thorough knowledge of the coasts of those islands, and I know of no place which requires a lighthouse and beacons more than Lochendahl, in Islay.
- M. 781. E. E. MORGAN.—Agent of the London Line of Packets, 70, South Street, New York.—November 8th, 1859.—24 years.—Commanded, during 20 years, Ships “Hudson,” “Philadelphia,” “Hendrik Hudson,” “Devonshire,” and “Southampton,” all sailing.—1. From Scilly to London.
- R.N. 782. R. HOSKYN.—Master, R.N., Admiralty Surveyor, Haleswood, near Belfast.—34 years.—1. East coast Ireland.
- P. 783. RICHARD PARRY.—Master Pilot, 49, Casneau Street, Liverpool.—August 12th, 1859.—46 years in Pilot Boats.—The “Mersey” Pilot Boat, No. 11, 67 tons.—1. Isle of Man, Holyhead, round to Liverpool and Whitehaven.—2. No.
- R.N. 784. JAMES HOSKEN.—Captain R.N., on half-pay, Stapleton, Bristol.—More than 40 years.—1. English, Irish, and Bristol Channels, coasts of Norfolk, Suffolk, and Essex.—2. Some parts of the Mediterranean, more particularly the French coast about Toulon and Marseilles.
- F.M. 785. WILLIAM T. HARWARD.—Bath, Maine, United States, Master of Ship “Rhine,” of Bath, now on her passage from Rio Janeiro to Savannah, United States.—Five years.—I command the American Ship “Rhine,” of Bath Maine, United States, 534 tons register, English tonnage, 620.—1. I am not well acquainted.—2. I am some acquainted.
- M. 786. WILLIAM LEE.—Shipmaster, No. 25, Constitution Street, Dundee.—35 years, 25 Master of Ships, various sizes.—“Lion,” of Dundee, 87 tons.—1. I am well acquainted with those parts of the United Kingdom from the Isle of Wight round by the North to Liverpool.—2. I am tolerably well acquainted in the Baltic and coasts of the continent.
Annexed to the above Answers by Mr. William Lee (786) is the following:—
“We, the undersigned, have considered the Questions in this paper, and, after due deliberation, we have agreed to the answers and suggestions given, particularly to that one suggestion the placing of a light upon the North Carr.
“JOHN LEE, Camp House, Broughty Ferry, Dundee; 25 years at sea, 15 years Master; at present “Master of Schooner ‘Violet,’ 108 tons.
“JAMES MUIR, No. 202, Aimer's Land, Overgate, Dundee; 22 years at sea, 11 years Master; “at present Master of the Schooner ‘Elizabeth,’ 109 tons.
WILLIAM SMALL LANDT, No. 14, Grant's Stocks, Dundee. I have been at sea 28 years, “4 years Master; at present Master of the ‘Majestic,’ 89 tons.
“DANIEL PETRIE, No. 22, Kyat Street, Arbroath; 23 years at sea, 10 years Master; at present “Master of the ‘Improvement,’ of Arbroath, 82 tons.
FRANCIS OGILVIE, No. 2, Clements Terrace, Dundee. I have been at sea 26 years, 7 years “Master; at present Master of the ‘Olive,’ of Dundee, 191 tons.”

Questions 35, 36, 33, 34, 1, 2.—*continued.*

787. JOHN FELL.—Master of the "Ada," No. 42, Regent Street, Liverpool.—7 years.—"Ada," of London, 102 tons register.—1. From Liverpool round north to Galway. M
788. JAMES MATHER.—River Commissioner for the Tyne, the Grove, Mestre, South Shields.—November 28th, 1859.
789. WM. AYLEN.—Captain R.N., 50, Lister Street, Hull.—November 25th, 1859.—36 years.—H.M.S. "Rhadamanthus," 900 tons, and 220-horse power.—1. English and St. George's Channel, coast of Ireland, part of the west coast of Scotland, Hebrides or Lewis Islands, north-east coast of England.—2. Coast of Africa.—Sierra Leone to the Bight of Biafra; South America—River Plate to Bahia, (West) Talcuhanu to Callao; Mediterranean,—east coast of Spain, Gulf of Venice, Grecian Archipelago, coast of Syria. R.N.
790. CHAS. BAKER.—Master Mariner, J. Moss & Co., 78, Tower Buildings, Liverpool.—13 years.—"Tamaulipas" Steam Ship, Liverpool, 335 tons, 80-horse power.—1. From the Lizard to Liverpool along the Welsh coast.—2. The French coast from the island of Ushant to the river Loire and the river Gironde. M.
791. J. A. BEAUMONT.—Commander, Waterside, Holyhead.—Between 17 and 18 years.—"Cambria" Steam Ship, tonnage 535, horse power 400; port of register, Chester.—1. English Channel, St. George's Channel, and Irish Sea.—2. Not sufficiently so to report. M.
792. GEORGE TAYLOR.—Commander, Benburb Lodge, Richmond, Dublin.—18 years.—"Ellen" Steamer, burthen 300 tons, horse power 250; port of register, Chester.—1. English Channel, St. George's Channel, and Irish Sea.—2. Not sufficiently so to report. M.
793. LUKE MARTIN (at sea).—1, Upper Sheriff Street, Dublin.—31 years.—Steamer "Sea Nymph," 304 tons, 43; horse power 350; port of registry, Chester.—1. English Channel, St. George's Channel, and Irish Sea.—2. Not sufficiently so to report. M.

APPENDIX.

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| 794. G. HOLLAND ACKERS. | 805. T. P. WILLIAMS. |
| 795. J. GRANT LUMSDEN. | 806. CHARLES BARING. |
| 796. C. R. M. TALBOT, M.P. | 807. F. D. P. ASTLEY. |
| 797. HENRY BROWN. | 808. WILLIAM DELAFIELD. |
| 798. DUFFERIN. | 809. RICHARD FRANKLAND. |
| 799. HENRY MANGLES DENHAM. | 810. SAMUEL R. BLOCK. |
| 800. J. LITCHFORD. | 811. ROBERT TRACEY. |
| 801. JOHN BERNERS. | 812. DAVID FRONT. |
| 802. W. ANDERSON. | 813. WILLIAM WILLS. |
| 803. THOMAS HERTLE. | 814. JAMES M. OUTRIDGE. |
| 804. D. WOOD. | |

3. Do you think that the Coasts of the United Kingdom, or the part or parts of them which you have named above, are well lighted?

1. Yes.—2. Yes.—3. I do consider them all well lighted.—4. I do.—5. Yes.—6. Yes.—7. Yes, thoroughly.—8. I do, excepting the harbour light of Tralee, county Kerry, which is very indistinctly seen even at a distance of three miles. I think a light on the Great Fox Skerry and Outer Blaskel would be of service.—9. Generally.—10. Yes.—11. No; a harbour light wanted for Alderney.—12. Yes.—13. No.—14. I do.—15. Yes.—16. In my opinion very well lighted.—17. Yes, all of them.—18. Yes.—19. Yes.—20. Yes.—21. Yes.—22. Yes.—23. Yes.—24. Yes.—25. Yes.—26. I think the coast of England is well lighted, particular where I have named.—27. Yes.—28. Yes.—29. Yes.—30. Yes.—31. Yes, all of them.—32. Yes.—33. Yes.—34. I consider the coast well lighted.—35. Yes.—36. They are to my satisfaction, with the exception of the Straits of Dover.—37. Very.—38. Yes.—39. There is room for improvement.—40. The parts of the coast that I have named are well lighted.—41. That part of the coast above mentioned is well lighted.—42. Yes.—43. Yes.—44. Yes.—45. Yes.—46. Yes.—47. Yes.—48. Yes; very good.—49. Yes.—50. The part which I have named is very well lighted.—51. Yes.—52. The places named above are well lighted, that is, the Start Point and the Bill of Portland; but a lighthouse placed on Strait Point would be an especial benefit to ships trading to the port of Exeter.—53. Yes.—54. They are well lighted.—55. Yes, I think they are well lighted.—57. The places named above are well lighted, viz., Start Point and the Bill of Portland; but a lighthouse placed on Strait Point would be an especial benefit to ships trading to the port of Exeter.—58. Yes.—59. Yes.—60. Yes.—61. I consider the east coast tolerably well lighted as a whole, but still capable of improvement on certain parts of the coast and shoals.—62. I do.—63. Yes.—64. Yes.—65. Those promontories named above are well lighted; but a lighthouse may be placed to the eastward of Exmouth Bar, which is essentially requisite.—66. The parts of the coast I have named are well lighted.—67. Yes.—68. Yes.—69. I do.—70. The parts of the coast that I have named are well lighted.—71. Yes.—72. Yes.—73. Yes, very good.—74. I do.—75. Yes.—76. The coasts of the United Kingdom and France are well lighted, but that of Spain not.—78. Yes.—79. Yes.—80. I think that part of the coast of the United Kingdom I have named is better lighted than any foreign coast with which I am acquainted.—81. I do.—82. Yes.—84. Yes, to my satisfaction.—85. I do.—86. Yes, to my satisfaction.—87. Yes.—88. Very well.—89. Well lighted, but more distinction would, perhaps, be desirable.—90. Yes.—91. No.—92. Yes, with the exception of Morte Point, and a beacon on the Monkstone.—93. Yes, with the exception of a floating light on the Skerweathers.—94. I think them well lighted.—95. No.—96. No.—97. I do consider them well lighted.—98. Yes.—99. Yes.—100. Yes.

101. Moray Firth well lighted. Light should be placed on north end of the Island of Stromar, and one on the butt of the Lewis.—102. Yes.—103. Yes.—104. I consider that generally they are well lighted.—105. The present lights are good.—107. Yes.—108. They are well lighted.—109. Yes.—110. Cannot answer this question as regards the present time, as it is 22 years since I left the sea.—111. The coast from Lynn to Newcastle very satisfactory, except in Lynn Roads, where a light ship would be very useful, and the Hunstanton is not so good as it might be.—112. Yes.—113. I think they are well lighted.—114. I think them well lighted.—115. I consider they are well lighted.—116. Generally they are so; but there is a few exceptions.—117. Yes.—118. Yes.—119. Yes.—121. Yes.—122. I think they are well lighted.—124. Yes.—125. Yes.—126. Yes.—127. Yes.—128. Yes, all of them.—129. Nothing can be better.—130. Yes.—131. Yes.—132. Well lighted, with the exception of the Owers light, which is not sufficiently brilliant, and would be better if it had three lights.—133. Might be better.—134. Yes, I do.—135. Yes.—136. Well lighted.—137. I do, with one exception.—138. Yes.—139. Yes, I do.—140. Well lighted.—141. Yes.—142. Yes.—143. I do.—144. The east coast of Scotland is well lighted.—145. The parts of the coast with which I am acquainted have a sufficiency of lights, and most of them are good.—147. Yes.—148. I think the parts above named are well lighted.—149. I do.—150. The coast of England, both east and west, has a sufficient number of lighthouses; an increase would become an evil, particularly on the south of Ireland.—153. The United Kingdom is well lighted. A light vessel ought to lay on the rit of Skagen, Jutland.—154. Yes.—

155. Yes.—156. Yes.—157. Yes.—158. Very well lighted.—159. Yes.—160. Yes.—161. Yes.—162. I have had no occasion to find fault.—163. They are much improved within these last 10 years, and will be much more so when the improved lights are placed where we have notice of.—164. I have found that lights placed at a short distance from dark rock or hill often very deficient, as if the light was absorbed by it.—165. I think them very well lighted.—166. Yes.—167. Yes, very well lighted so far as I have had an opportunity of experiencing them.—170. Yes.—172. Yes.—173. Yes.—174. Yes.—175. I do.—177. Yes.—179. Yes.—180. I do.—181. Yes, better than any other coast.—183. Yes.—185. They are all very well lighted.—186. Yes.—188. Yes.—189. Yes.—191. Yes.—192. Yes.—193. Yes.—194. Not sufficiently.—195. They are well lighted.—198. All the coast well lighted.—199. Very well lighted.

201. Yes.—202. Yes, very well indeed.—203. Yes.—204. Yes.—205. Yes.—206. Yes.—207. I do.—208. Generally well lighted.—209. Yes.—211. Yes.—212. I do, with one exception.—213. Yes, generally they are so.—214. Yes.—215. Yes.—216. Yes.—217. All well lighted.—218. Yes, I think they are.—219. I have no fault to find of the lights on the British coast.—220. Yes.—221. Yes.—222. No.—224. Yes.—225. They are.—226. Yes.—227. Yes.—228. Yes, I think them well lighted; but having seen such great improvement in my experience I assume we have not attained perfection.—229. Yes.—230. Yes.—231. Yes.—232. I have no fault to find with the lights on the British coast.—233. I do.—234. Yes, the coasts of the United Kingdom, in my opinion, are better lighted than any other, with very few exceptions.—235. I think the part of the coast to which I have referred is well lighted, and very much improved in that respect the last 25 years.—236. Yes.—237. Well lighted.—238. Brest Rock near Girvan should have a bell or a light. Lady Isle near Troon should have a light.—239. On the Brest Rock, 17 miles south of Ayr, a great many vessels get ashore. It has a beacon, but should have an alarm bell or light. Lady Isle, near Troon, should have a light.—240. No.—241. Pretty well.—242. Yes.—244. Yes.—247. I am not acquainted with any foreign coasts.—248. I think the coast in the English Channel is well lighted.—249. Yes.—250. Yes, I do.—251. I do.—252. I consider the English Channel to be well lighted.—253. I think that they are admirably lighted throughout.—254. The coast between the Firth of Forth and Shetland is all well lighted.—255. Well lighted.—256. Yes.—257. I do.—258. I do, generally speaking.—259. Yes.—260. Very well; none better.—261. Particularly so.—262. I think they are now well lighted.—263. All, except the Bristol Channel.—264. Well lighted.—266. Yes.—268. Well lighted.—269. Yes.—270. I do.—272. Coast of England, yes.—273. I do.—274. I think most of the United Kingdom, above named, generally well lighted.—275. Yes.—276. Needles, red, ought to be flash.—277. In my experience I always found the coast of the United Kingdom well lighted.—278. I think the United Kingdom well lighted.—279. Yes.—280. I do.—281. Well lighted.—282. Yes, generally, but improvements might be made.—283. I think that the coasts of the United Kingdom are well lighted.—284. I think they are.—285. Yes.—286. I think the coast in general is well lighted, the Firth of Forth excepted.—287. I think with more lights distinguishable from one and other, there would be more safety in navigating.—289. United Kingdom; yes.—291. I think all the coasts above named are well lighted.—292. I do.—293. The coast of Great Britain is well lighted.—294. Generally.—295. Yes, but would recommend a light at the butt of the Lewis.—296. The east coast is, in my opinion, very well lighted.—297. Yes.—298. Well lighted from Scilly Islands to Start Point.—299. Yes, and has the greatest confidence in them being well kept.—300. Yes.

301. The English Channel would be well lighted if there was a brighter red light at Dungeness.—302. Very excellently so.—303. I do.—304. No.—305. Well lighted.—306. Yes.—307. Yes.—308. Yes.—309. I do.—310. Yes, I think the coast above named is very well lighted.—311. Yes.—312. Yes.—313. Yes.—315. I have never seen any coast as well lighted as the coasts of the United Kingdom.—316. Yes, well lighted.—317. I do.—318. I do.—319. Yes.—320. Well lighted.—321. Yes.—322. Yes.—323. Yes.—324. Yes.—325. Yes.—326. Yes.—327. I think they are all well lighted to the best of my knowledge.—328. I think that a light ship on the north-east part of the Inner Downs would be of great service.—329. I do.—330. Yes.—331. Yes.—332. Yes.—333. Additional light wanted on the east coast of Orkney Islands.—334. Yes.—335. Yes.—336. Yes.—337. Yes.—338. A light or signal gun would be required on the Bird Island, as vessels passing up in thick weather cannot see St. Paul's, shape their course for the south-west point of Anticordi, consequently

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some ships go ashore at the first-mentioned island.—339. Yes.—340. Yes, I think they are.—342. Yes.—343. Yes. On second consideration, I consider that Bardsey Island Light is not so good as the other lights in the St. George's Channel. I invariably find it difficult to pick up; and have sometimes passed it when I felt almost certain that I was within range of it on a fine night.—344. Yes.—345. Yes.—346. No.—347. Yes.—348. In my opinion they are generally.—349. I do not think there are enough lighthouses.—350. Very well lighted.—351. I do.—352. Yes.—353. Yes.—354. Yes.—355. Yes.—356. Yes.—357. Yes.—358. Yes.—359. I do believe that they are at present well lighted, with the exception of the Channel islands Jersey, Guernsey, &c.—360. Yes, perfectly so in the district named.—361. As to the coast of the United Kingdom already mentioned there are none other better lighted.—363. Yes.—364. Yes, except at St. Alban's Head.—365. I do.—366. Pretty well.—367. All but the Bristol Channel.—368. I do not.—369. I think quite.—370. They are well lighted.—371. I do not.—372. Yes.—374. On the whole I consider the coasts of the United Kingdom are well lighted. On the north-east coasts, as above, the local harbour lights require to be increased in brilliancy and power to be more easily distinguished from shore lights in bad weather; also on the length of coast, as above. Additional lighthouses, such as lately erected at Whitby, and in course of erection at St. Abbs' Head, would be of great advantage. At this port I consider a lighthouse on the high ground north of the harbour entrance is much required.—375. Yes.—376. Yes.—377. From my experience, I think the lights greatly improved and increased.—378. Not sufficient by two.—379. All very well, except the Rundle Stone, near the Land's End, where there ought to be a light (coloured) on shore, so constructed as to darken the light; the light to be seen only when south of the Stone. Have seen as many as four wrecks at a time in consequence.—380. Very well. A light on the shore to show us the Rundle Stone would be desirable.—381. Generally.—382. Very well, except at the Rundle Stone, where there should be a coloured light on the shore darkened so as only to show the direction of the Stone.—383. Yes.—384. The coast I have named is badly lighted from the Old Head west.—385. Yes.—386. Yes.—387. Yes, very well.—388. Yes.—390. They are well lighted.—391. I do.—392. Yes, very well lighted.—393. Most of them.—394. Yes.—395. The best that I have seen in any place.—396. I consider the coast of the United Kingdom much better than any other coast.—397. Yes.—398. Yes.—399. Nothing to complain of.—400. I do.

401. Very well lighted, but, indeed, rather overlighted in some parts.—402. Yes.—403. Yes.—404. Yes.—405. Yes.—406. Yes.—407. Yes.—408. Well lighted.—409. Yes.—410. Yes.—411. Yes, with the exception of the Kenebeg floating light, which I consider a very poor light.—413. Yes.—414. Yes.—415. I do.—416. Yes.—417. I think that the United Kingdom is well lighted.—418. Yes, well lighted.—420. Yes.—422. Generally well.—423. I think very well lighted.—425. I do.—427. Yes.—428. I do.—429. Yes.—430. Yes.—431. Yes.—432. Yes.—433. United Kingdom, yes; Africa, no.—434. Yes.—435. Yes.—436. I think the lights in both English and St. George's Channels are very good.—437. Yes.—438. Yes.—439. Yes.—440. Yes.—441. I am of opinion that a light is required on Guernsey.—442. Yes.—443. United Kingdom, yes.—444. Yes.—445. Yes.—446. Yes.—448. Yes.—449. Coast of England.—450. Yes.—451. Yes.—452. Yes.—453. Yes.—454. Yes.—456. Yes.—457. Yes.—458. Yes.—459. Most assuredly.—460. There might be improvements made.—461. Yes.—462. Yes.—463. Yes.—465. Yes.—466. The Great Bahama Bank is not. A light ought to be on Stürup Kay and on Orange Kay for light draught vessels crossing the bank.—467. Yes.—468. Yes.—469. France, next to England.—470. Yes.—471. Yes.—472. I think they are well lighted.—473. Yes.—474. I certainly do think so.—475. United Kingdom, yes; Red, Arabian, and Indian Seas, no.—476. Yes.—477. Well lighted.—478. Yes.—479. Yes.—480. Yes.—481. I think they are.—482. Judiciously.—483. I consider the coasts of the United Kingdom to be well lighted, except that the new light on the Blackwater Bank, being partly revolving, has already been mistaken for Tuskar, and about 400 lives lost thereby.—484. A sufficient number of lights, but badly arranged.—485. Yes.—486. Yes, I do.—487. In general I do.—488. I do.—489. Yes, at present most complete for general navigation. For small tidal harbours I have no opinion to offer.—490. Yes.—491. I think the George and North Channel and all round Ireland are well lighted.—492. In my opinion, it is well lighted and attended to.—493. I think they are all well and properly lighted.—494. I

think a light on Mart Point, on the coast of Devonshire, would be of great benefit to the shipping in Bristol Channel.—495. I do think that the coasts of the United Kingdom are well lighted; but this is only since 1854.—497. The lights in the English and St. George's Channels are good and varied, so as not easily to be mistaken.—498. Pretty well lighted, but I think some of them are not visible far enough, such as the Saltees lightvessel.—499. Yes.—500. I do, with all precaution taken, such as the lead attended to and a good look out.

501. I believe a lighthouse to be very much needed on Arranmore Island, on the site of the old lighthouse.—502. Very well.—503. I think the coasts of the United Kingdom well lighted, but in some places there is a want of lights.—504. Pretty well.—505. No.—507. Yes.—509. Yes.—510. Yes.—511. Yes.—512. Yes.—514. I do.—515. Yes.—516. Yes.—517. Yes.—518. They may be improved.—519. Exceedingly well lighted.—520. I do.—521. As they are now building a light on St. Abb's Head, I think they are well lighted.—522. Yes, in general.—523. No.—524. Yes, I do.—525. Yes, in general.—526. Yes.—527. Yes, I do.—528. Generally so.—529. Yes.—530. No. There ought to be a lightship on Manecorugan Shoals.—531. I think the coasts of the United Kingdom are well lighted.—532. Yes.—533. Yes.—534. Yes.—535. Well lighted, but the atmosphere not so clear as in many other parts.—536. Perfectly well lighted.—537. No. I think there are still very important lights needed.—539. On the whole, pretty well.—540. Yes.—541. I consider there has been great improvement generally around the coasts of Great Britain and Ireland, including lightships.—542. Very well lighted.—543. St. George's and English Channels very well lighted, when I knew them; the Highlands of Scotland, and Zeland, very badly; Bay of Fundy, middling; in the West India Islands and coast of Guiana there were no lights.—544. Yes.—545. I do.—546. Yes; but might be improved with additional lights, which I shall name where.—547. I think the lights on the English coast to be very satisfactory. Some years back the lights along the coast were not so numerous, and even then I considered it very well lighted.—548. Yes.—549. Yes. 550. Yes.—551. Yes.—552. Yes.—553. Quite well lighted.—554. No.—555. Yes.—556. Yes. I do not know of any improvement to be made at present.—557. Yes.—558. Very well lighted.—559. Yes.—560. (cannot give an opinion.—561. A few more lights would facilitate the navigation immensely (the islands of Scotland).—562. Yes; very well lighted.—563. Yes.—564. Yes. The lights that are already in position are good lights, but I think the high light at Orfordness is somewhat deficient in brilliancy.—565. I think the coasts of the United Kingdom are all well lighted.—566. Yes.—567. Yes.—568. Very well.—569. Yes.—570. Yes.—571. Perfectly so.—573. Yes.—574. Yes.—575. Yes.—577. I think, sufficiently.—578. Yes, with an exceptional case here and there.—579. Yes.—580. I would suggest that the high light on Nash Point, Bristol Channel, should point out a berth clear of the dangerous shoal, Breaksea Point.—581. I consider the coasts well lighted.—582. Generally very well lighted.—583. In some places improvements could be made.—584. About the Land's End, capable of great improvement.—585. The French lights can be seen farther than ours.—589. Generally, yes.—590. Yes.—591. The lighthouse now erected at Godrevy Island near St. Ives fills the only blank that I have known.—592. No.—593. I do think the coasts of the United Kingdom are now well lighted.—594. I do.—595. I think that the parts which I have named are well lighted.—596. I think so.—597. Yes, I do.—598. Yes.—599. I do.—600.—Yes.

601. With very few exceptions; Acklow lightship is not so good a light as it should be, and there is great need of a lighthouse on the Coningbeg rocks.—603. Some parts.—604. I think so.—605. Yes.—606.—Yes, moderately so.—607. Yes.—608. Yes.—609. Yes.—610. Yes.—611. Yes.—612. Yes.—613. Well lighted.—614. Yes, but improvements may be made.—615. Yes, but may be improved.—616. Yes, but may be better.—617. I do.—618. The lights are good, but more are wanted.—619. Yes.—620. I do not feel myself sufficiently competent to give an answer to these questions. I have been away from England upwards of five years, and previous to that used only to visit the Channel once a year for several years.—621. Yes.—622. I do generally.—624. Generally speaking, very well lighted.—625. Yes.—626. Would require improvement.—627. Yes, as to position and number, but not brilliant enough.—628. I do.—629. I think that the coasts of the United Kingdom are the best lighted.—630. I think the coasts of the United Kingdom are the best lighted.—631. Yes.—632. Yes.—

633. I do.—634. Cannot say.—635. The English Channel is well lighted on the English coast; they are like excellent fingerposts to assist the mariner. A more powerful light on the Start would be desirable; no commander feels satisfied in his progress up channel, if he has not seen the land, to pass this important headland unseen.—636. I do.—637. I think that the coast of England is as well lighted as any coast that I know.—638. I think them very well lighted, but not perfectly so.—639. Yes.—640. Yes.—641. Well lighted.—642. Yes.—643. From what I knew once, and the number of lights I know which have been added, I should say, generally well lighted.—644. Yes.—645. Yes.—646. That port with which I am acquainted I conceive to be well lighted.—648. Not well lighted.—649. Yes.—650. Yes.—651. I think the lights lately improved on our own coast will bear comparison with those on the north coast of France which I had occasion to use last year on the coast of Normandy.—653. Yes.—654. The coasts of the United Kingdom are well lighted, but I cannot say much about the Colonies.—656. The parts with which I am acquainted are well lighted.—657. Very well lighted.—658. Yes.—660. Yes.—666. I think the English Channel well lighted for all purposes of navigation.—667. Yes.—668. Yes.—669. Yes.—670. During my service in Her Majesty's Navy, I have been employed abroad almost constantly. My knowledge of the lights, lightships, and buoys in the United Kingdom is, in consequence, very limited, and therefore of no value to the Commissioners.—671. Yes.—672. Yes, with an exception named below.—673. Yes, with the exception named below.—674. Yes.—675. Yes.—676. Yes.—677. I much approve of the new lightship proposed by the Honourable Brethren between Bardsey Island and the South Bishop, but still recommend a light on Strumble Head.—678. I do.—679. Yes, a light is required on the east end of the Shambles.—680. Yes.—682. I beg respectfully to state that my practical knowledge of the subjects referred to in the accompanying questions has been so limited, that I feel incompetent to give an opinion on them, the west coast of Africa being the only station I have had an opportunity of becoming well acquainted with.—683. Well lighted.—685. Yes.—686. I think them well lighted.—687. Well lighted.—688. Not been employed in the Channel sufficiently to give an opinion.—689. Yes.—690. Yes.—691. Yes.—692. Yes.—693. Yes, excepting Dungeness.—694. Yes.—695. I do.—696. Yes.—697. Yes, very well.—698. Yes.—699. Generally so.—700. Very well lighted.

701. Yes, with the exception of the Wolf Rock.—702. Yes.—703. Yes, I think so.—704. I consider the coast well lighted.—705. Yes.—706. Very well lighted.—707. Yes.—708. Yes.—709. I do think they are well lighted.—711. Very well lighted.—712. All established lights are good, but that on the Holyhead Breakwater I consider can be improved.—715. I do think them very well lighted.—716. I do think them very well lighted.—717. Well lighted.—718. Yes, except the Menai Straits near to Beaumaris.—719. Yes.—720. Yes.—721. Yes.—722. I consider that they are.—723. Well lighted.—724. Yes, I consider them well lighted.—725. It is the opinion of several nautical people, that a lightship placed about that part of the crag opposite the "Old Man of Hoy," Island of Hoy, Orkney, would be very useful to vessels steering from the Portland Firth for Hoy Sound, the lights there not being visible by vessels to the south-west of Hoy, and in with the Caitnessland.—726. Yes, with the exception of the north-west coast of Scotland, north of the mouth of the Clyde.—727. The English and Irish Channels seem to be well lighted.—728. Yes.—729. Yes.—730. I think the coasts of the United Kingdom above named are well lighted so far as the number of lights.—732. Yes.—733. Generally.—735. I do, as far as I have experienced.—737. Yes, generally.—738. I think they are.—739. I think so, generally.—741. Yes.—742. In general, except one.—745. I do not think that the coasts of the United Kingdom are as well lighted as they ought to be.—746. I think the east coast might be improved.—747. I think the Nab light might be improved.—748. Yes; but I think a lightship would be of service on the Varne off Dungeness.—749. Yes.—750. No.—751. Some improvement might be made, particularly in Dublin Bay.—752. Yes, very well.—753. I have long been of opinion that we have too many lights on the coast, and the consequence is an increase of collisions and neglect of the lead, with more shipwrecks; but without this increase of lights, steamers could not run in and out of ports at night.—754. Decidedly better than any other part of the world with which I am acquainted.—755. Yes.—756. Yes.—758. Yes, with the exception of the west coast of the Western Hebrides.—759. I believe all, except St. Alban's Head, which I think requires a revolving light with inter-

mittent red flashes.—760. I think that the coasts of the United Kingdom are well lighted with the exception of the west coast of Ireland.—761. As a landsman I do; but I prefer leaving this, and other questions I might give some information on, to be better answered by seamen. Also, see replies to 8, 15, 19, 22, 23.—762. Not competent to judge.—763. Yes.—764. Yes, very well lighted.—765. Yes.—766. I do.—767. For the last 12 years been on Indian stations, Bay of Bengal, Arabian Sea, and Red Sea. Know little of the coasts of United Kingdom.—770. Yes, admirably lighted.—771. I consider the coasts of Great Britain that I am acquainted with to be well lighted.—772. The United Kingdom, I think, was well lighted.—773. Better than other nations.—774. Not sufficiently.—775. It is upon the whole well lighted; but there are places where lights are needed.—776. Yes, with one exception.—777. I think in general it is well lighted.—778. Yes, all very well.—779. Yes.—780. Lochendahl is not lighted at all, and it is highly essential, for the safety of both life and property, that a harbour light should be erected to guide vessels to a proper anchorage, and prevent them going into that dangerous Bay of Laggan, in which (during my recollection), no less than 21 vessels have gone on shore in consequence of not having a harbour light. The harbour is frequented in stormy weather by a great number of ships taking the north channel, as also by numerous coasting vessels bound for the west coast of Ireland and other places.—781. Yes.—782. Yes.—783. Yes, with a few exceptions.—784. Yes.—785. I think they are.—786. There are places where additional lights are necessary.—787. Not very well.—789. Good on the coast of England and Scotland, but think some improvements might be made on the coast of Ireland.—791. I think so.—792. Yes.—793. Yes.

4. Do you think that the Coasts of the United Kingdom are as well lighted as any of the Foreign Coasts which you have already named?

3. I think them all as well lighted as any foreign coast that I am acquainted with.—4. Better.—5. Yes.—7. Yes.—10. Yes.—11. No experience of the lights on the coasts of the United Kingdom.—12. Much better.—13. I am not able to form an opinion.—14. In the whole, much better.—16. Quite as well.—17. Yes.—18. Yes.—19. Yes.—21. Better in many respects.—24. Yes; superior.—26. I think that the English coast is as well lighted as the coast I have named.—31. Yes.—32. Yes.—33. Some of them.—36. I think so, to the best of my knowledge.—38. Better.—39. I do not.—41. Not known.—42. Yes.—43. Yes.—45. Yes.—46. Yes, superior.—47. Yes, better.—48. My opinion of the lights on the shores of Great Britain are as good, or preferable, to the foreign.—49. Yes, superior.—54. Better than any coast, excepting the Gulf of Finland.—55. I think they are good, if not superior.—59. Yes.—61. Scarcely, in all respects, though as a whole I consider our English lights better, where we have them; but, in many of the parts I have referred to, their lights are very close together, though not generally so brilliant as ours.—62. Yes.—68. Yes.—69. Yes.—72. Equally so, if not better.—73. Yes.—75. Yes, and better.—76. Yes.—79. Yes, better.—80. Yes.—81. Better.—83. I have never seen any foreign coast with lights equal to the coast of England.—84. I am not acquainted with foreign coasts.—85. I do.—86. I am not acquainted with foreign coasts.—87. Don't know.—88. I think much better.—90. Don't know.—94. I think them as well lighted as any foreign coast I have seen.—97. Quite as well as any foreign coast I am acquainted with.—98. English coast well, what I have seen.

101. Yes.—102. Yes.—103. Yes.—107. Yes, and considerably better.—108. Equally so.—110. Formerly I thought the coasts of the United Kingdom as well lighted as any other.—111. No knowledge.—113. Much better.—114. I think them as well lighted as any part of the world with which I am acquainted.—115. I consider them better lighted.—116. Better.—118. Yes.—119. Yes.—121. Yes.—122. I do not know.—124. Yes.—127. Yes.—128. Yes.—129. Yes, and better.—130. Yes.—131. As well as any I know.—132. Cannot give an opinion.—134. Yes, I do.—136. Better lighted than any foreign.—137. Better.—138. Yes, better.—139. I think the coasts of the United Kingdom are as well lighted, if not better, than the foreign coasts.—140. Better lighted.—141. Yes.—144. No.—145. The lights will compare with the best lights in the United States.—147. The lights in the United Kingdom are better lights than those on the foreign coasts above named.—148. I think the coasts

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Question

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of the United Kingdom are better lighted than the foreign coasts.—149. I do.—150. I do, and with far better lights than any foreign coast I have been cruising upon.—152. Yes.—153. Better.—154. Yes.—155. Yes.—156. Much better.—157. Yes.—158. Much better.—159. Much better than any other I have seen.—160. I consider them better lighted than any other part of the world.—161. Yes.—162. Better.—163. Yes, and much more so.—165. I think they are much better lighted than the above foreign coasts.—167. I think they are.—170. Yes.—172. Yes.—173. Very little, if any.—175. Much better.—177. Yes.—178. On the whole, I think the English coast is the best.—179. Yes.—180. I do.—181. Yes; better.—183. Yes.—185. The English coasts have the best lights.—186. Better than any I have sailed along.—188. Certainly.—189. Yes.—191. Yes.—193. Yes.—195. Much better.—198. Nil.

201. Yes.—202. Much better than the Straits of Malacca, and quite as good as that of Australia.—203. Yes.—204. Yes.—205. Yes.—206. Yes.—207. I do.—208. Yes.—209. Yes, with the exception of the Gulf of Finland, which is the best lighted channel I have navigated.—212. Yes.—213. Yes, better than any of the others named.—214. Yes.—215. Yes.—216. Yes.—217. They are.—218. Yes, and much better.—219. The British lights are far superior to any lights on the Dutch or Belgium coasts.—220. Yes.—221. Yes.—224. Have no knowledge of them.—225. They are.—226. Much better.—227. Yes; equal, if not superior, in every respect.—228. I think the coasts of the United Kingdom as well lighted as the coasts to which I refer above, and as well as any coast in the world that I have visited.—229. Yes.—230. Yes.—231. Yes, and better.—232. The British lights are far superior to the German, Dutch, and Belgian lights.—233. I do.—234. All of them, with the exception of the Gulf of Finland.—235. I think they are, and much better than in most cases.—236. Yes.—237. England is best lighted.—238. I think so.—239. I think so.—241. Nearly.—242. Better.—244. Yes, the French have good lights.—249. Yes.—250. Equally as good, and better, than some parts.—251. Better so.—252. I think the lights of Capes Griznez, Bardeur, and La Hague are more brilliant than English lights in general.—253. Much better than any I have seen.—256. Yes.—257. I do.—258. Yes.—260. Much better.—261. Much better.—262. I have seen few lights except those on the coasts of the United Kingdom, and a few on the coast of France.—263. Better.—264. I think, better lighted.—266. Yes.—269. Yes.—270. I do.—272. Yes.—273. The French lights are very good, but the English are better.—274. I think the coasts of the United Kingdom are quite as well lighted as the coasts of France and Gulf of Finland, and better lighted than the coasts of Spain, Portugal, and Italy.—275. Yes.—276. Yes.—277. I always found the coasts of the United Kingdom better lighted than any foreign coasts I have been on.—278. Yes.—279. Yes.—280. I do.—281. As well, and in most cases better.—283. I think they are as well lighted as any foreign coast I know of.—285. Yes.—286. I think they are.—287. I think they are better lighted.—289. Yes, better.—291. I think the coasts of the United Kingdom are better lighted than that of any other country, except France, to which they are quite equal.—292. Yes, I think they are as well lighted as any coast I have been on.—293. The coast of Great Britain is better lighted than any coast I have seen.—294. Yes.—295. Yes.—296. The United Kingdom is better lighted than any of the coasts named.—297. Yes.—298. I think that the coast of England is better lighted than any foreign coast that I am acquainted with.—299. Yes.—300. Yes.

301. Yes.—302. Much better, the northern coast of France excepted.—303. I do.—304. Yes.—305. Quite as well lighted.—306. Nil.—307. Not prepared to say.—308. Yes, and much better.—309. I think they are.—311. Yes.—312. Yes.—313. Yes.—315. I am sure it is.—316. Better lighted (France excepted).—317. I do.—318. I do.—320. I think it is.—321. Yes.—322. Better.—323. Yes.—324. Yes.—325. Much better.—326. Yes.—327. I think the coast of the United Kingdom is better lighted than any foreign coast I know.—328. Yes.—329. See answer to No. 2.—331. Yes.—335. Yes.—336. Yes.—338. Better.—339. Yes.—340. Yes, they are.—342. Much better.—343. Yes.—344. Found the British coast best lighted.—345. Yes.—346. Yes.—347. Yes.—348. At least as well, though not so numerous.—349. No.—350. Equally so, if not better.—351. Better than any foreign coast with which I am acquainted. Some of the French lights in the British Channel are as good as the English.—352. Yes.—353. I do.—354. Yes.—355. Yes.—356. Much better.—357. Yes.—358. I do.—359. I do think that the English lights are as good, if not preferable, to the foreign coasts I have visited.—360. Not sufficiently ac-

quainted with the lights on foreign coasts to answer the question.—361. The coasts of the United Kingdom are better lighted than any other coasts that I have seen.—362. Not being to sea for many years, I cannot tell.—363. I do.—364. Yes.—365. I have always considered them fully equal, if not superior.—366. Cannot say.—369. Much better in England.—370. Can pass no remark.—372. Yes.—374. Have not sufficient acquaintance with foreign coasts to answer this question.—375. Yes.—376. Yes.—377. I think better.—380. Yes, very much better.—381. Yes.—382. Yes, better.—383. Yes.—384. I know, from others, that the coast of America is closely lighted, and that confusion does not arise.—385. Yes.—386. Better.—387. Yes, better.—388. Generally they are so.—390. Better than many parts; but the French coasts and Gulf of Finland, I think, are better than our coasts, *i.e.*, more lights.—391. I do.—394. Yes.—395. Much better.—396. Yes, superior.—397. Yes, and better.—398. Yes, better.—399. Yes.—400. I do.

401. Not only as well as, but better than any other, excepting a very limited part of the French coast.—402. I consider the coasts of the United Kingdom better lighted than any others I am acquainted with.—403. Yes.—404. Much better.—405. Yes.—406. Yes.—407. Yes.—408. Yes.—409. Better.—410. Yes.—411. The coast of the United States has far more lights, but the lights of the United Kingdom are much better.—413. Yes.—414. Much better.—415. The coasts of England and Ireland are better lighted than any foreign coast I have seen.—416. Yes.—417. I do, and much better.—418. Yes.—419. On the whole, I think our own coast the best lighted.—420. Yes.—423. I think much better than any foreign coast which I have coasted along.—424. I do.—425. I do.—427. Yes.—428. I think they are.—429. Yes.—430. Yes.—431. Yes.—432. United Kingdom better lighted.—433. Better.—434. Yes, better.—435. Yes.—436. I do.—437. Yes, or better.—439. Better.—440. Yes.—441. Yes.—442. Yes.—443. Yes, far better.—444. Yes.—445. Yes.—446. Yes.—447. As well as any coasts I know of.—448. Yes.—449. Yes.—450. Yes, better.—451. Yes.—452. Yes.—453. Yes.—454. Yes.—455. Better than any coast that I have yet visited.—456. Better.—458. Yes.—459. Decidedly more so.—460. United Kingdom and France are best.—461. Much better.—463. Yes.—465. Yes.—466. Better than any other coast that I know.—467. Yes.—468. Yes.—469. I fancy much better than any other coast.—470. Better.—471. Yes.—472. Yes.—473. Yes.—474. I do think the lights of the United Kingdom better lighted than any other country that I have been to.—475. Not all parts.—476. Yes.—477. Yes.—479. Yes.—480. Yes.—482. Superior.—483. I do.—484. I think better than any, except from Cape Cod to East Port (United States).—485. Yes.—486. Yes. I do.—487. Yes.—488. Much better.—489. Yes, in every respect far superior.—490. Much better.—491. I think that the parts of our coasts that I have mentioned are better lighted than any foreign coasts that I have been on.—492. Yes, and much better.—493. Quite as well lighted.—494. No coast so well lighted as the English coast is.—495. Much better; but I do not know any country in the world where they are more required.—496. I think they are.—497. Better than any other coasts, except the New England States of North America.—498. Yes.—499. Much better.—500. I do give the preference to the United Kingdom.

501. I believe the lights to be of a superior order and arrangement in the United Kingdom.—502. Better.—504. Yes, and better.—505. Cannot say.—507. See No. 2.—510. Yes.—511. Yes.—512. Yes; much better.—515. Yes.—516. Yes.—517. Much better.—518. Yes.—519. When going foreign, it was to the Mediterranean mostly. One voyage also to the Baltic. Cannot remember those coasts being lighted equal to the part of the coast named in first question.—521. I think they are.—522. Yes.—524. No. I think the French lights are superior in brilliancy, and seen much farther than our own.—527. Yes. I do.—528. I do. A light in the south bay of Wexford would be of great advantage.—529. Yes.—530. No.—531. I think the coasts of the United Kingdom are better lighted than any foreign coast, with the exception of the Gulf of Finland.—532. Cannot say.—534. Yes.—536. Quite as well.—537. No remark.—538. Yes; better.—540. Yes.—541. I have reason to know there is no part of the world where the navigator has more confidence in than approaching or sailing through St. George's (English) or the Irish Channel.—542. As well as any, if not better.—543. They were then better lighted.—544. Yes; better.—545. I do.—548. Yes.—550. Yes, and even better.—551. Yes.—552. Yes.—553. Equally so.—554. Yes.—555. Yes.—

556. Yes; I do not know of any improvement to be made at present.—557. Yes.—558. Perhaps better than the French, and much better than the Spanish or Portuguese.—559. Yes.—560. Cannot give an opinion.—562. Yes; quite as well.—564. Yes; I think the English coast is as well lighted as any I am acquainted with.—565. The United Kingdom is as well lighted as any coast that I have seen.—566. Yes.—567. Yes.—568. Much better.—569. Do not know any.—570. Yes.—571. In every respect.—573. Yes.—574. Yes; much better.—575. Yes.—577. Better.—578. Equally with France; better than any other.—579. Yes.—581. I consider the coasts of the United Kingdom are better lighted than those named.—583. No.—584. French lights superior.—585. I consider the lights on the coast of France, and the recent first order of lights on the coast of the United States, to be more powerful than those of the United Kingdom.—589. Yes, with certain exceptions.—590. Yes.—591. Never had an opportunity of comparing.—593. I do think the coasts of the United Kingdom are as well lighted as any of the foreign coasts. The Cape of Good Hope, Mauritius, and Ceylon are well, but the Bay of Bengal and Australian coast are rather indifferently so—few lighthouses.—594. I do.—595. I do think that the coasts of the United Kingdom are as well lighted as the foreign coast I have already named.—596. I think it is better lighted than any foreign coast.—597. Yes, better.—598. Yes.—599. I do.—600. Yes.

601. Yes.—603. Yes.—604. I consider them far better lighted.—605. Yes.—606. Yes.—613. Very much better lighted than any coast I have ever been on.—619. Yes.—621. Yes.—622. I do.—623. Generally speaking, yes.—624. I have thought the French lights superior, but am not prepared to say how much is attributable to difference of atmosphere.—625. Yes.—627. Probably as well, but not better lighted than some.—628. I do.—629. I think the coast of the United Kingdom better lighted.—630. I think the coasts of the United Kingdom are better lighted than any coast I have been upon.—631. Yes.—632. Yes.—633. Yes.—634. Cannot say.—635. Yes.—636. I think they are much better.—637. Yes.—638. I think they are.—639. Yes.—640. Far better.—641. Inferior only to the French.—642. Yes.—643. I think so.—644. Yes.—645. Yes.—646. I think so.—648. Yes.—649. Yes; the American (U.S.) coast has too many lights, but I do not think any English light is equal to Cape Griznez (French).—650. Yes.—651. Yes; I think so.—652. Yes.—653. Yes.—654. Much better.—656. Yes.—657. I think the English coast and channel are much better lighted than any foreign coasts I have visited.—658. Yes.—660. Much better.—665. Yes.—666. Yes, most decidedly.—667. Yes.—668. Yes, better.—669. Yes, I think better.—671. Yes.—672. Yes.—673. Yes.—674. Most assuredly.—675. Certainly.—676. Very much better.—678. Equally so.—679. Very much better.—680. Yes.—683. I consider it better lighted than any part I have visited.—684. Better.—685. Infinitely better.—686. Yes.—687. Yes.—688. Yes, better.—690. Yes.—691. Yes.—692. Yes.—693. Yes.—694. Yes.—695. Better.—696. Yes; much better.—697. Yes.—698. Yes.—699. I consider the Danish waters better lighted than any.—700. I consider them better lighted than any I have visited.

701. Yes, much better.—702. Yes.—703. Yes.—704. I consider that our coasts are better lighted, generally speaking.—705. No opportunity of forming an opinion.—706. Much better.—707. Yes.—708. Yes.—709. Equally, or indeed better.—715. I cannot speak from my own experience, but have often heard that the lights on the coast of France are better than ours.—716. Cannot say.—717. Cannot say.—719. No opinion.—720. Yes.—721. I do, of late years.—723. Cannot say.—724. Better than the above.—726. Yes, as regards the number and portion of the lights. I consider the French lights to be more brilliant.—727. Yes.—728. Yes, in number. The French lights are more brilliant.—729. Yes.—730. I think the coasts of the United Kingdom are on the whole better lighted than any foreign coasts that I am acquainted with.—732. Yes.—733. Yes.—735. I cannot say that I know of any better lighted than United Kingdom.—738. Yes.—740. They are.—741. Yes.—742. No.—745. I do not think they are, with the exception of the Spanish and Portuguese coasts, which have only two or three really good lights.—747. I think not.—748. Yes, better.—749. Yes.—750. No.—751. Yes.—752. Yes, and better by far.—753. The United Kingdom is better lighted than any other country.—754. See Answer to No. 3.—755. Yes.—756. Yes.—758. Much superior.—759. I believe it is, with the exception of France.—760. I think they are much better lighted.—762. Much better.—763. Yes.—764. Yes.—766. Better.—771. I consider

the coasts of Great Britain, as a general rule, are better lighted than any foreign coasts that I have seen.—773. Yes, better.—777. I think the coast of the United Kingdom is better lighted than any of those.—778. Yes, and better.—779. Yes.—781. Yes.—784. Yes.—785. I think the coasts of the United Kingdom are as well lighted as any in the world.—786. As a whole they are better.—789. Yes.

5. If you think that the Coasts of the United Kingdom are not so well lighted as those of any other country or countries, name those countries in the order in which you prefer their Lights.

3. Generally, I give preference to the lights of the United Kingdom.—5. I think the north-east coast of England is quite as well lighted as any foreign coasts I am acquainted with.—10. I think the coasts of the United Kingdom are as well lighted as any other country I am acquainted with.—13. I am not able to form an opinion.—14. I think the lights on the coast of England so good, where I am acquainted, that I am not able to suggest any improvement.—18. Our coasts are as well lighted as other countries.—21. Better.—24. None.—26. I know of no other country that is lighted better.—32. The French coast is well lighted, from Dunkirk westward.—33. France.—36. In the Straits of Dover, where there is two sand banks, where a light ship is very much wanted. I have often mentioned to masters of vessels that, if asked for, I have no doubt it would be granted.—39. The south coast of France.—41. Not known.—42. The South Foreland is very good.—43. There are many of the modern French lights surpasses many of our English.—45. England.—46. None.—48. To the best of my knowledge, the coast that I am acquainted with is as well lighted as any coast that I have witnessed.—49. None.—55. I don't know of any.—59. I consider the coast mentioned above to be lighted equal to any foreign: Russian, as next, their lights are good.—61. On the coast of Norway, in the Scognae, the lights are pretty numerous, though not so bright as ours. In the Gulf of Finland they have many lights, very close together, and some are very good.—73. The English lights are best, and in more order.—75. They are well lighted, and better than any country I have visited.—76. France and England equally well lighted.—79. None.—83. I prefer our own lights above any I have ever seen.—84. I am not acquainted with other countries.—85. None.—86. I am not acquainted with other countries.—87. Don't know.—90. Don't know.—94. Nil.—97. I give preference to the lights of the United Kingdom.

102. No country.—108. None.—110. Do not recollect.—111. No knowledge.—113. I have never seen better than the lights of the United Kingdom.—114. I think them as well lighted as any, or perhaps, better than any other part of the world.—118. I do not.—119. I think our coasts well lighted.—121. My opinion is, that the coasts of the United Kingdom are now better lighted than any other country ever I have visited.—122. I do not know.—127. I see none better than the English lights.—131. France has one brilliant light, seen for about 30 miles.—134. I cannot name any country that I have ever been to better lighted than the United Kingdom.—136. Nil.—138. No.—140. Nil.—141. Consider all equally good.—144. Sweden.—147. I think the coasts of the United Kingdom are better lighted than in those countries I have visited.—149. No country better lighted.—161. I do, to the best of my knowledge.—163. The Sinatts. The Lynn shore light might be improved by a stronger light, and another south of the Humber.—165. I know of no coasts better lighted than the coasts of the United Kingdom.—167. Nil.—170. I think that the coast of the United Kingdom is as well lighted as any other coast.—173. I cannot decide.—175. I do not know of any.—177. Yes.—179. France.—180. So far as my experience goes I think there are no coasts any better, if so well lighted as the English coasts.—181. Great Britain, above all.—188. No.—189. English lights the best.—198. Nil.

204. As well as any I have ever seen.—209. The United Kingdom is as well, with the exception as stated above in No. 4.—212. My opinion is that the lights of the United Kingdom are surpassed by none.—213. The United States of America, judging from hydrographic surveys and descriptions, appear to me to have the best system of lights, and their coasts are better lighted than those of any other nation, but I have had no opportunity of verifying this opinion by personal examination or experience.—215. Yes.

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—217. I know none I can prefer before our own coast lights.—
 218. I cannot name any.—219. The French lights are quite equal to the British lights; I have seen the French lights at a farther distance.—220. I think the coast of the United Kingdom better lighted than those foreign countries named above.—221. English lights are equal to any I have seen.—225. Yes.—228. I give a practical opinion, and incline to think that some individual foreign lights are very good, would not say better than individual English lights, yet I refer to Bordeaux, Ushant, Cape Grisnez, Schoenen, Burnholm, Dagerort, are fine specimens of lights; and the lights in the Gulf of Finland are a credit to Russia, the more so, as I have been many voyages there, and never paid one penny to or for lights, buoys, or beacons.—229. Replied to in answer to No. 4.—230. I think some of the French lights, for instance, those on the coast of Algeria, more brilliant than the generality of English lights.—232. I consider the French lights quite adequate to the British lights.—233. Nil.—234. The Gulf of Finland is the only best, in my experience, “not as regards brilliancy, but the lights are placed so very exact within the range of each other, and placed with great care as to the height of the light, to correspond with the approaching danger,” and answers well where the soundings are irregular.—235. I do not know of any country that is better lighted.—237. Cannot be better lighted.—241. I prefer the French lights.—242. The coast of the United Kingdom is better lighted than any other country with which I am acquainted.—244. There are no lights on any coast equal to those on the English coast. Grisnez, coast of France, is a good light.—249. Better lighted.—250. There are good lights on the French coast, from Ushant to St. Andese. Gorduvam, at the entrance to Bordeaux, is a capital light.—262. The lights on the coasts of the United Kingdom are equal, if not superior, to any I have seen anywhere.—266. Better.—273. England.—279. I think the coast of the United Kingdom is the best lighted coast in the world.—278. Think our coast as well lighted as any I have visited.—280. I prefer the English lights.—281. As well lighted, and in many cases better.—283. I do not think there are any coasts better lighted than the coast of the United Kingdom.—285. The Gulf of Finland is as well, but not better. French rivers are more carefully lit, say Seine, and on a cheap principle, being attended to by a custom officer on duty.—286. I think our coasts are better lighted, and that the Cattegat and Gulf of Finland is equally so.—287. The British coasts are best lighted.—288. I am of opinion the coasts of the United Kingdom are as well lighted as other countries.—292. I do not know of any foreign coasts better lighted than the coasts of the United Kingdom.—293. Much better.—297. The United Kingdom is the best lighted of any country or countries I am acquainted with.—300. I think the coasts of the United Kingdom are as well lighted as any coast I have been on.

302. France, whose lights are of more recent erection, has a slight advantage; and, from the long establishment of some of ours, it would be difficult to arrange them better.—306. Nil.—307. Not prepared to say.—309. Do not know of any.—313. I do not know any country so well lighted as the United Kingdom.—315. There are no coasts so well lighted as the coasts of the United Kingdom.—316. I know of no country's lights preferable to our own.—320. The French lights are more brilliant.—322. The coast of France and Gulf of Finland are well lighted, but not better than the United Kingdom.—323. Have not seen other coasts.—324. None.—328. Equal to any.—329. I cannot, of course, say, not being foreign.—336. I think the United Kingdom to be well lighted.—339. I think they are.—340. I think the coasts of the United Kingdom are the best lighted.—342. I think that they are much better lighted.—343. No.—345. I consider the coast of the United Kingdom better lighted than any country that I have been to.—346. United States.—349. The south coast of France, and coast of Italy.—351. I do not know of any.—352. I prefer the Fresnel lens light.—355. Well lighted.—356. England.—357. Yes.—358. I think our coasts better lighted than any I have traded upon.—361. There are none better lighted those of the United Kingdom.—363. Never saw better lights than those on the English coast.—366. Unable to answer, never having been in another country.—369. England.—374. Have not sufficient acquaintance with foreign coasts to answer this question.—375. Yes.—377. Superior.—381. I prefer the English.—384. I know, from others, that the coast of America is closely lighted, and that confusion does not arise.—386. British lights superior to all others.—387. England and Belgium equally good.—390. The French lights are, I think, better generally than any

others.—391. I have not been in other countries for some time.—395. None.—396. No other country equal to England.—399. England is the best I know of.—400. I consider them better lighted than any other country I know of.

401. France, in a very few instances only.—404. I think the United Kingdom better lighted than any other part of the world.—406. I think they are better lighted.—407. English.—410. They are.—411. None.—418. I prefer the lights of the United Kingdom before all other lights.—420. Yes.—422. I prefer the first order of French or dioptric lights; the old lights on the coast of the United States are being removed for the above lights.—423. I can name none.—425. I do.—427. I know of no foreign coast so well lighted as that of the coasts of the United Kingdom.—431. Yes.—434. I think the coasts of the United Kingdom as well lighted as any other country to my knowledge.—436. I have seen no other country better than the United Kingdom.—437. Nil.—439. Great Britain.—440. I think they are as well lighted as the coasts of any other country.—442. I think they are as well lighted as any.—445. I think they are as well lighted.—450. English lights.—451. United Kingdom.—452. United Kingdom.—454. None.—456. Far better.—458. They are better lighted than most countries.—463. The coast of the United Kingdom is as well lighted as any coast I know.—465. Great Britain.—466. Better lighted than any other country that I know.—467. None.—468. No.—469. England first, France next.—474. I know of no other country better lighted than the United Kingdom.—475. The French lights in their new colonies, and in the Mediterranean, appear superior to ours.—482. I think no country can be more judiciously lighted than the United Kingdom.—483. I think the coasts of the United Kingdom better lighted than those of any other country I have visited.—485. I think the coast of England is better lighted.—491. I think that our coasts are as well lighted as any country that I have been on.—492. None as well lighted.—493. There are more lights from New York to West Guddy, near Eastport, than there is in the same number of miles on the English coast.—494. The French coast is lighted with very powerful lights.—497. New England States, N.A., Lundy Island, and the Highlands of Newer Sink, New York, and Havannah; the latter seen farthest.—498. I think they are.

500. I believe the coasts of the United Kingdom to be much better lighted than any others I have seen.—504. Better.—505. Cannot say.—507. See No. 2.—511. No.—516. I consider the French lights as good as the English; the Norwegian next.—517. No country is so well lighted as Great Britain.—518. I know of none.—519. As above stated (No. 4).—524. I prefer the French.—527. I think the United Kingdom is as well or better lighted.—528. As well lighted as any other coast; generally better.—530. Americans.—531. I think the coasts of the United Kingdom are as well, or better, lighted than those of any other country.—532. Cannot form an opinion.—534. Nil.—536. Nil.—537. No remark.—541. I am of opinion the lights around the coasts of Great Britain and Ireland, including floating lights, are superior to any other country.—544. No.—548. None.—552. The French coast may be better, but, if so, the coast requires it.—553. No other country, to my knowledge.—554. North Channel.—556. The English and the French lights are equal; other nations are not so good.—559. I think that the English coast is better lighted than any other country; but the lights are not so strong as the French lights.—560. Cannot give an opinion.—569. Do not know.—571. I think the coasts of the United Kingdom comparatively better lighted than other known to me.—573. I consider the United Kingdom best lighted.—575. Yes.—583. France.—584. France.—589. France and Spain, in one or more instances.—591. I can offer no opinion.—593. The United Kingdom is better lighted than any other country.—595. I think the coast of the United Kingdom as well lighted as any foreign country I have been at.

601. I think they are as well lighted.—605. I think the coasts of the United Kingdom better lighted than any other, France excepted.—606. Upon the whole they are as well, but must admit the reflectors are more powerful upon the Norwegian coast.—613. None better lighted.—621. No.—622. I noticed no better lights than the South Stack, Skerries, Calf, Tuskar, Longships, the Lizards, Eddystons, and Beachy Head.—626. I think the United Kingdom is as well lighted as any country I know.—627. I consider the Gulf of Finland and the Russian coast in the Black Sea exceedingly well lighted; the lights being numerous, judi-

ciously placed, and brilliant, Spanish and French lights very brilliant also.—628. I think the coasts of the United Kingdom as well lighted as any other coast.—629. From experience I prefer none to the United Kingdom, I have found great irregularity in foreign lights.—630. I think there are no other country or countries I would prefer to the British, both to the regularity of lighting between sun-down and sun-rise.—633. I know of none better lighted than the United Kingdom.—634. Not aware.—636. I consider the coast of England better lighted than those of the other countries that I am acquainted with.—639. Next to British I notice the Russian care of the Gulf of Finland.—642. I consider the coasts of the United Kingdom as well lighted as any other. The coast of France next.—643. I think so.—650. I think that French lights generally are better than English.—651. Having been employed for a quarter of a century in the Naval Civil Department as Master Attendant, Harbour Master, &c., I cannot answer this question decidedly.—654. Better; but some of the French lights are very good, perhaps better than the English.—657. I have already stated my belief that the coast of England is much better lighted than any foreign coast I know.—660. I do not think the coasts of any country so well lighted as those of Britain.—665. Yes.—666. I have never seen any light that I prefer to those in the English Channel.—667. From what I have seen I consider the coast of England as well lighted as any Foreign country.—668. I do not think that any coast I have been on is so well lighted as the south coast of England.—671. I think the coast of the United Kingdom as well lighted as any foreign country I have visited.—675. I think they are.—687. None better lighted.—688. The English lights are best.—691. I think our coast is better lighted than any I am acquainted with.—692. As well lighted as any country.—693. Not able to give an opinion.—697. I think the English coast well lighted and good, but owing to difference of atmosphere lights cannot be seen so far as in some foreign climates.—698. Nil.—700. Nil.

701. I do not think that other countries are so well lighted as the coast of the United Kingdom, meaning those of which I have had experience.—702. None.—703. I have never seen better lights than those of the United Kingdom.—704. I cannot name any.—707. I think our coasts well lighted compared with other countries.—708. France.—709. I think the coasts of the United Kingdom well lighted.—715. Not able to give an opinion for the reason stated at No. 2.—716. Cannot say.—717. Cannot say.—719. No opinion.—720. United Kingdom.—721. I do consider our coast to be as well lighted.—723. Cannot say.—724. None better or so good.—727. The coast of the United Kingdom is decidedly the best lighted, except some parts of France.—730. Some of the French appeared to me to be the best, but nearly all the foreign lights of recent construction which I have seen appear very good.—738. I think they are quite as well lighted as any, and better than most, foreign coasts.—741. None.—742. French coast, Bay of Biscay.—743. From what little I have seen I think the lights are good and places well chosen in Ireland and England, but I cannot consider I can give satisfactory answers to these inquiries.—745. I think the French lights that I have seen are better than ours; also the light on the Bayonas (Vigo Bay), Ceuta Light, Cape Pertusato Light, Cape Camarat and Porquerolles Lights, Cape Carbon Light (Algiers).—747. The French.—749. Those lights on the English coasts I am acquainted with are good, yet I prefer the French lights.—750. I consider the coast of France to be better lighted than the coast of the United Kingdom.—753. The lights are not in fault, although improvements must keep pace with scientific discoveries. Oil must always be the standard, but many harbour lights might be lighted with gas.—755. Old England.—756. None.—758. Next to the English lights I prefer the French.—759. I consider the French lights more powerful and brilliant, and placed at every point of danger (nearly).—760. I know of none.—761. Same as in Answer 3.—762. Not competent to judge.—766. Lights upon the coast of France superior to those upon English coast.—771. Nil.—777. The Gulf of Finland is well lighted, but not better than some parts of the coast of England.—779. As good.—789. United Kingdom coast is better lighted than other countries I have visited.—790. I prefer the lights on the west coast of France to any I have seen, only the French lights are not so well placed as the lights in the United Kingdom.

6. Have you ever noticed any derangement or irregularity in the light of a Lighthouse, or Floating Light: or have you ever known it to go out; or have you ever known a Floating Light to be off her Station?—if so, state when and where.

1. No.—2. No.—3. I have not seen any derangement of the lights. The only instance witnessed by me of a light-vessel being off her station, was that of the Nore lightvessel going adrift in a very heavy gale from the W.N.W., about the year 1824 or 1825, as near as I can imagine the time from memory.—4. Not in my experience.—5. No.—6. No.—7. No.—8. Whilst at anchor in the River Mersey, many years since, probably in 1839 or 1840, I have an impression that one of their lightvessels parted her moorings at high water, and ran in over the banks; I think it was the north-west lightship.—10. I have, during my surveying operations, noticed the light on Caldy Island occasionally grow very dim.—13. I have, at times, observed discrepancies in the periods of revolution. Have not known a light to go out at improper time. Have known a lightvessel to break adrift in the North Sea, but so long since that I cannot give particulars.—14. I have known the South Foreland light to go out occasionally, and the South Sand Head lightvessel to go adrift, soon after she was placed there, but not since, and the Nore light twice.—16. I have known the Seven Stones lightship off her station, but not lately.—17. No.—18. No.—20. I have known them to break their chains, but have been replaced as soon as possible. The Cockle.—21. No.—23. Cockle, and replaced directly.—24. Not any. Yes; I have known the Leman and Owers to go adrift, but replaced with all possible speed.—25. Cockle, replaced directly.—26. No, neither with shore or floating lights. I have known the Leman and Owers, Newarp, Cockle, and Gatt light ships, break their chains, but they have been quickly brought to an anchor close to the moorings.—27. Cockle, replaced directly.—28. Cockle, and was replaced directly.—29. Only the Cockle, and was replaced directly.—30. The Cockle light, and the Newarp light, and St. Neot's light have all been adrift, but were soon replaced; not all at one time.—31. No.—32. The Sunk light drifted from her station about 16 years back, during a heavy gale at north; that is the only one I know of.—33. I have often, in peculiar weather, observed the float lights, such as the Owers, show two lights instead of one, owing to a kind of mirage.—34. I do not know of any derangement, either on shore or afloat. I have never known them to go out, but have observed that they are very punctual in lighting. Have not known any lightvessel out of place.—35. No.—36. The South Sand Goodwin lightvessel has been adrift two or three times, but I don't know the dates.—37. No.—38. No.—39. No.—40. I do not recollect any derangement or irregularity in a lighthouse or floating light, or ever known one to go out. I have known the Sunk light to drive from her station and cause the loss of nine vessels, about 18 years past.—41. The Newarp floating light off Yarmouth, about 21 years ago, drove about one mile and a half to the westward; I was passing at the time and observed it. I never noticed any derangement or irregularity in the lights of any lighthouse or floating light, except in the single instance above mentioned.—42. Not for some years.—43. I have known both Nab and Owers lightships to have been driven off their stations, so far back, I cannot name.—44. No.—46. Not any. Yes; I have known the Leman and Owers to go adrift, but replaced with all possible speed.—47. Never.—48. None, to my knowledge.—49. Not any. Yes; the Leman and Owers, but replaced with all possible speed.—50. No.—51. No.—52. No.—53. No.—54. The Rock lightship at Liverpool drove from her moorings in January, 1839.—55. I have not.—57. No.—58. No.—59. No.—60. Cockle, and was replaced as soon as possible.—61. Personally I have not known or seen any irregularity in any of our lights. Though I have seen some instances, in foreign waters, I have not personally known of any instance wherein a floating light has been off her station. I have heard of them breaking adrift in stormy weather.—62. No.—63. No.—64. I have frequently observed the South Foreland high light to be invisible for several minutes about the time of midnight, but I am not prepared to state that any irregularity exists in the present method of lighting it.—65. No.—66. I do not recollect any derangement or irregularity in a lighthouse or floating light, or ever known

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one to go out.—67. I have never noticed any derangement in any lighthouse or floating lightvessel.—68. No.—69. None.—70. I do not recollect any derangement or irregularity in a lighthouse or floating light, or ever known one to go out. I recollect the Sunk light to drive from her moorings about 18 years ago.—71. Cockle.—72. No, I never saw any off her station.—73. No.—74. I have not.—75. No.—76. No.—78. No.—79. Not any. Yes, I have known the Leman and Owers to break adrift, but placed back to her station as soon as possible.—80. I recollect the South Sand Headlight vessel to be adrift, but it was a short time after being at that station. In other respects, I have not observed any derangements in the lighthouses or lightvessels.—81. None.—83. No, never.—84. I have not.—85. I have not.—86. I have not.—87. Never.—88. On one occasion the Sunk lightship drifted from her moorings on November 21st, 1841 or 1842, when many lives and much property was lost. I passed up Swin in the morning, November 22d, about 2 A.M., in a heavy north-east gale.—89. Never.—90. Never.—91. Not for many years.—92. No.—93. I have seen the Mumbles Tower without a light on three different times, but not with the present light-keeper.—94. I have never found any derangement or irregularity in the light of a lighthouse or floating light, or have I ever known them to go out during the period they should be lighted, or have I found a floating light off her station.—95. No.—97. I have never seen any derangement of any of the lights.—99. No.—100. No.

101. Never.—102. Never.—103. No.—104. No, with the exception of the north-west lightship at Liverpool, in 1839.—105. But once; the Kish lightship was driven from her station. I cannot state the number of years; at least 30 years.—106. No.—107. No.—108. No.—110. Never.—111. I am of opinion the Hunstanton shore light does not show so well as formerly. In coming up the Lincolnshire coast I often make the Lynn Well light first, which was not formerly the case.—113. Never.—114. None.—115. Never noticed any derangement or irregularity, or have ever known a floating light off her station.—116. Have known the north-west lightship, at Liverpool, when the *Erin* steamer was lost.—118. No.—119. No.—120. Never.—121. I have known the floating light at the entrance of Liverpool part from its moorings, and also the bell buoy.—122. I never have known any derangement of lights.—123. Never.—124. No.—125. No.—126. No.—127. No.—128. No.—129. Newarp light I have known break from her moorings in a gale (three times).—130. No. I have known many of the floating lights to break adrift; the last I remember was the north-west lightship at Liverpool, in 1839.—131. Sometimes the floating lights are very dim.—132. Never.—134. I used sometimes to notice the upper light at the South Foreland being very dull, and sometimes would appear to have gone out, till lately, when the new light appeared there. Some years ago (soon after being placed) the South Sand Head light broke adrift, but many years have elapsed since such an occurrence took place.—135. No.—136. Lynn Well float parted from her moorings some time since.—138. Yes; Ballycotton light once, for which, I understand, keeper was discharged.—139. No, I have not.—140. At Lynn, some years since, the float drove from her moorings.—141. No.—142. No.—143. I never heard.—144. Not in Scotland.—145. I have not.—147. I have never noticed any derangement or irregularity in a light of a lighthouse or floating light. I have known the Saltees lightvessel off her station, in December 1824.—148. I have never seen any derangement in any of the lights, nor any floating light off her station.—149. Never.—150. No.—152. No.—153. Never.—154. No.—156. No.—157. No.—158. No.—160. No.—161. No.—162. No.—163. With the above light I have often noticed a great fullness, and with Dungeness, but not so much of late.—164. During the experience of 40 years I have not observed one single irregularity in the lights of lighthouses, nor any lightship off her station.—167. No, I have not.—170. No.—172. No.—173. On or about the 10th April 1858, off Tuskar, I could not see the light over five miles in the morning and evening; it might have been on account of the atmosphere.—174. No, I have not.—175. I have not.—177. No.—180. I have never known any irregularity in any lights, neither have I ever known any lightship to be off her station.—181. No.—183. No.—185. Never.—186. No.—187. No.—188. No.—189. No.—191. No.—192. None.—193. No.—195. Only once have I observed irregularity in a lighthouse, and that was some years ago; the light on PAgentras went out, and remained so all night.—196. No.—198. No.—199. Never.—201. No.—202. Never.—203. No.—204. Never.—

205. Only when they break from their moorings.—206. No.—208. At times, floating lightships, from bad weather.—209. None.—211. No.—212. None.—213. I have never noticed any derangement or irregularity in the light of a British lighthouse, but have frequently observed such irregularities in the lighthouses on the shores of the Mediterranean, and have several times known them to go out before daylight appeared. I have several times, within the last 25 years, known the Liverpool lightships to be off their stations. I have also known of the Arklow, Kish, and Bahama lightships being off their stations, but do not remember the dates of these occurrences.—214. Seen floating lights break adrift through stress of weather.—215. No.—216. No.—217. None.—218. I have not.—219. I have never seen any irregularity in our lighthouses or floating lights on the British coast.—220. Cape Passero (in the island of Sicily), about four years ago, not lighted, or not seen, when very near it, at two different times.—221. No.—222. No.—225. No.—227. Never.—228. No irregularity worth naming, excepting lightships drifted from their stations, but cannot give dates. Have known lightships from Seven Stones, Nore, Hasborough Gate, that is, Newarp, Dudgeon, drifted from moorings; but this is of rare occurrence.—229. No.—230. No.—231. No.—232. I have never observed any irregularity in any lighthouse or floating lightship on the British coast.—233. Never.—234. Not any, in my own experience; except in extreme cases. The Sunk lightship broke adrift about 28 years ago, and the Mouse about six years ago, both in heavy gales of wind, and great loss occasioned by it.—235. Not on the coast of England, to my knowledge.—236. Once, the Newarp in an extreme gale at north-east.—237. Lights are well attended too. One terrific gale of wind, I think the Dudgeon, I missed from her moorings.—241. Not any.—242. No.—244. Yes, the South Sand Head broke adrift in the years of 1832 and 1833.—246. No.—247. I never have.—248. I have never noticed any derangement or irregularity in any lighthouse or floating light.—249. None.—250. Formerly I have, when they were lighted with coals, at St. Anne's, Milford, and Holms, in Bristol Channel, Saltees and Seven Stones lightships have been off their stations; I do not know the exact time.—251. I cannot ascertain the date (at present), but I have been in New York when the lightship which lies off Sandy Hook was in port, having drifted.—252. I have known the Owers and Bembridge lightships to be off their station, but cannot give the date.—253. I have never observed any irregularity in lights or lightvessels.—254. I have never noticed any derangement or irregularity in any of the lights along the coast: they are all well kept.—255. Lightships at N.W. of Liverpool, been adrift, 1839.—256. Yes, I have known the floating light, stationed off Berlicce Bar, to be off her station, in June or July 1853.—257. Never.—258. Very trifling, consequently did not take a note of the time. Arklow lightvessel broke her mooring bits in (I think, '43 or '44, and ran up to Dublin; easterly gale.—259. Mouse light broke adrift about five years ago, in a gale.—260. Seven Stones lightship and N.W. lightship, near Liverpool; do not remember the dates.—261. Never knew of any irregularity.—262. I have not.—263. None.—264. Lynn Well floating light, some years since.—266. No.—268. Not any.—269. I have never noticed any derangement.—270. I have not.—273. Often, in the Baltic.—274. Never.—275. No.—276. No.—277. I never found any derangement in any light I have passed.—278. No.—279. No.—280. I have always found them only lighted, and in position.—281. Never.—283. I have never noticed any derangement of the kind referred to.—285. Not for many years. Floating lights vary in power as you pass the different radii of reflection. Gull Stream has appeared to me the strongest; Dudgeon float the least powerful, which may arise from the great refraction caused from the extensive sand bank and coasts in the Well, when the wind is off shore.—286. I have never done so.—287. I knew the N.W. lightship at Liverpool to be off her station; and in Liverpool, about the winter of 1854, when the *Earl of Roden* steamer was lost, and all hands, on her passage from Dundalk to Liverpool, on East Hoyle Bank.—288. Never.—289. No.—291. I have never known such.—292. I have not observed any derangement or irregularity in either lighthouse or floating light, or known them to go out. The Mouse light was driven from her station on the 27th December, 1852; the Sunk, some years previous.—293. No.—294. No.—296. No.—297. I have never noticed any derangement in any light, lighthouse, or floating light.—300. No.—301. No.—302. Never, to my knowledge.—303. Never.—306. Never noticed any derangement or irregularity.—

307. None.—308. No, never.—309. I have not.—310. I have known the Owers and Bembridge floating lights off their station, but do not remember the date.—311. No.—312. I remember the Sank light ship breaking drift many years ago; the date I forget, but it was the same night the *Surety* bark was lost in the neighbourhood of Yarmouth.—315. No.—315. I have not seen any derangement or irregularity in any lighthouses or floating lights.—316. No.—317. I never have.—318. I never have.—320. I have not.—321. No.—322. Knew once the Galloper light off her station, and once found the Rundlestone buoy gone.—323. No.—325. No.—326. No.—327. I have not experienced any derangements or irregularity in any lighthouses or ships.—328. No.—329. Such an occurrence has never come under my notice.—330. No.—331. No.—332. No.—333. No.—334. No.—335. No.—336. I have known a floating light off her station, viz., Sunk and Newport, but do not recollect the dates.—337. No.—339. Do not remember a case.—340. I have not known any.—342. Never.—343. Never.—344. No.—345. No.—346. No.—347. Once only, in the case of Ballyeottin light, south-east coast of Ireland, owing to some neglect; was reported to Ballast Office, Dublin, and inquired into. It happened in the early part of 1858.—348. I have often observed a difference in the brilliancy of the same lights when about the same distance from them, but cannot decide whether this was caused by the condition of the lights or the condition of the atmosphere, or the condition of the vision of the observer at the times.—349. No.—350. None.—351. Never, during my experience.—352. No.—353. None.—254. No.—355. No! No!!!—356. No.—358. No.—380. Nothing of this kind has come to my knowledge.—361. None.—363. No.—364. Never.—365. Only once, at Ballycottin, last year; light-keeper dismissed in consequence.—366. About 20 years ago, Liverpool north-west lightship drove from her station, with a hurricane.—367. No.—368. I have not.—369. I have not.—370. No.—371. I have not.—372. No.—374. I consider floating lights may answer in very sheltered roadsteads and creeks, but are not applicable to exposed coasts. They are also objectionable, from the expense of maintenance.—375. None.—376. No.—377. No.—379. Never.—380. Never.—381. Never.—382. Never.—383. No.—386. No.—387. No.—388. Leman and Owers lightships would be improved if the revolving light had an interval of darkness; the atmosphere sometimes deranges the appearance of a light; the revolution is not sufficiently distinct.—390. No.—391. Not any.—392. No, I have not.—393. The English and Welsh Grounds light blew out about eight years ago.—394. No.—395. None in Great Britain; went out, at Valparaiso, in 1850.—396. No.—397. No.—398. No.—399. Never.—400. Never.

401. No. I have heard of instances, at rare intervals, which I cannot now quote from memory.—402. Never.—403. No.—404. No.—405. No.—406. No.—407. No.—410. No.—411. No.—413. The Arklow ship, I think, in year 1847.—414. Never.—415. I have not.—416. No.—417. I have not.—418. No.—420. No.—423. None.—424. I have not.—425. None.—427. None.—428. I have not.—429. Never.—431. No.—432. No.—433. Not individually.—434. Never, unless from stress of weather.—436. I have not.—437. No.—438. No.—439. Heard of them.—440. No.—441. No.—442. No.—443. No.—444. No.—445. No.—446. Yes; the outer floating light, River Hoogly; the light to go out, and likewise the ship to be off her station.—450. No.—451. No.—452. The floating lightvessels are frequently driven from their stations in hard gales.—453. Never.—454. No.—455. No.—456. No.—457. No.—458. No.—459. Never.—461. Never.—462. No.—463. Have not noticed any derangement or irregularity in any light-house or floating light.—465. No.—466. No.—467. No.—468. No.—469. Tuskar too long in the interval for a leading light, especially in a misty night, and not having seen anything previous.—470. No.—471. No.—472. Never.—473. Not to personal experience.—474. I have never noticed derangement or irregularity with any of the lights. Years back I have noticed the Kish light to be driven from her moorings; and also the Arklow lightship driven from her moorings by storm.—475. Yes; Truconalee lighthouse, which led to the loss of the *Aea*; and floating lights are often off their stations at the mouths of the Indian rivers.—476. No.—477. No.—478. No.—479. Not to my knowledge.—481. I have never noticed any of these derangements.—482. No.—483. I have not.—484. No.—485. No.—286. No.—487. I made the Fastnet Rock light in the beginning of September 1857, at 4.10 a.m., and it never revolved until daylight. I wrote to the master light-keeper concerning it; he replied, that it was his turn on shore. I left all the particulars with Messrs. Scott and Co., Lloyd's

agents at Queenstown, but I do not think that they ever took any proceedings. I was from Callao at the time.—488. Never.—489. Yes. The Seven Stones lighthouse, some years since, off her station; on a second occasion, no light visible.—490. I have never noticed any derangement or irregularity in the light of any lighthouse or floating light, nor have I ever known one to go out. I remember, several years ago, the Liverpool north-west lightship to have been driven off her station through stress of weather, but she was immediately replaced.—491. I have never known anything wrong of either lighthouse or floating light.—492. No; except the Liverpool north-west light vessel, January 1834.—493. I have never, in my experience, seen a lightvessel off her station; neither have I observed any irregularity in the lights.—494. I have never seen any derangement, or seen any lightship off her station.—495. Never.—496. No.—498. I have once, in the month of April 1856, that the light on Ballycottin Island was first seen at 7.30 p.m., on the 7th; light not very brilliant, weather gloomy, light winds; at 20 minutes past 10 p.m. the light was fixed, and remained so for nine minutes, afterwards flashed, and then for a period of 15 minutes totally obscured; the ship only seven miles off.—499. None.—500. February 1853, bound to Bremen, found the buoys out of their place, also the lightship from her moorings, from stress of weather; ran for the Elbe, found there the lightships out of their place.

501. I would recommend Enniskillen Head inner light-house to be raised, so that they could not be mistaken, as they often are by strangers.—502. The Coningbeg lightship, off Saltees, Ireland, but cannot state the time.—504. No.—505. Cannot say that I have.—507. None.—509. No.—510. No.—511. No.—512. No.—514. No.—515. No.—516. No.—517. None.—518. I consider the Arklow lightship a very poor one.—519. At no time have I noticed any derangement.—521. None. I would propose for a leading light, such as the Start, for all instances, (ships from sea making that light cannot at all times tell their exact distance off) suppose a lower light, of a different description, was placed lower down, so as to be distinguishable just so many miles off in clear weather, say, five or more, as the occasion may require, ships would then know their exact position, and shape their course accordingly.—522. No.—524. Never.—525. No.—526. No.—527. I have never noticed such an occurrence.—528. The Arklow lightship, on one occasion, broke adrift some years past, in a dreadful gale in the channel, bound to Liverpool at same time.—529. No.—530. Often saw derangements whilst trimming the south-west and north-west lightships, when driven from their moorings.—531. I have not.—532. No.—533. No.—534. No.—536. None whatever.—537. No, I never noticed any derangement, &c. &c.—539. No.—540. Not to my recollection.—341. I am not aware of any derangement or irregularity in any lighthouse. In one instance the north-west Liverpool lightship drifted from her moorings, on the night of the 11th December, 1831, which caused the loss of the steamer *Lord Blayney*, and all hands, from Newry to Liverpool, on the West Hoyle.—542. I have never known anything of the kind, excepting one of the Liverpool lightships parting from her moorings, in January, 1839.—543. No.—544. Never.—545. Only once; the Cockle Gat light.—546. Yes; the Dudgeon floating light, which, by her ranging about, appears like a revolving light on first sighting her. Yes; on the 29th December, 1849, the Cockle floating light broke from her moorings.—548. No.—549. No.—550. No.—551. No.—552. No.—553. No, at no time.—554. No.—555. No.—556. No, I have not.—557. No.—558. Sometimes, when trimming, the light of a float will be in temporary obscurity, but not of any consequence.—559. No.—560. Yes. Gozo light revolves irregularly, varying from three-fourths to one minute and a half. Two years and a half ago the light on Pedra Branca, Straits of Singapore, on two occasions, was extinguished more than an hour before daylight, on one occasion much to my inconvenience, which circumstance I reported.—562. No.—563. No.—564. I cannot bring to mind that I have noticed any derangement in any light, or remember any floating light to be off her station, only I have heard of such things many years ago.—565. I have not known the floating lights to be off their station.—566. No.—567. No.—568. Never.—569. No.—570. No.—571. Never, to my knowledge.—572. No.—573. No. I have found the lights always correct.—574. The Leman and Owers, also the Cockle lightships, were off their stations on the 29th of December 1849.—575. No.—577. None.—578. No.—579. Yes; Dudgeon adrift, in January 1839.—580. No.—581. I have never noticed any derangement or irregularity in the light of a lighthouse or floating light, nor have I ever known a floating light to be off her station.—

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583. Lizard lights put out or not attended to, sometimes late, before sunrise.—584. No.—585. I have passed Mine Head light on a clear night and not seen it, when I considered I ought to have done so.—587. Beaver Island, on the east coast of Nova Scotia, is a revolving light. In 1854 I reported, at Halifax, the light was out of order, it being at that time fixed, and not revolving, as it should have been.—589. No.—591. Never observed.—592. North-west floating lightship, Liverpool, in January 1839.—593. I have seen several floating lights drove from their station through stress of weather, but I do not remember the dates.—594. I have not.—595. I have not noticed any derangement or any irregularity in any lighthouse or floating light, nor yet to go out or be off her station.—596. I never saw anything wrong with the English lights or lightvessels.—597. Never noticed any irregularity.—598. Not to my recollection.—599. I have not.

601. Except the Smalls light this time I have never known any. I remember the north-west lightship off Liverpool breaking adrift in the year 1833, I believe in the month of December, no other; but the Saltees has been adrift I believe.—602. Never.—603. No.—604. I have not.—605. No.—606. No.—607. North-west lightship broke adrift in the January hurricane, 1839.—608. North-west lightship broke adrift from her moorings in January, 1839.—609. North-west lightship broke adrift in January, 1839.—610. North-west lightship broke adrift in January, 1839.—611. North-west lightship broke adrift in January 1839, in a hurricane.—612. North-west lightship broke adrift in the heavy gale of January 1839, and once previously within my recollection.—613. No.—614. Point Lynus light does not mask soon enough for the Dulus Rocks. Crosby shore light is often very difficult to make out. North-west lightship has been off her station twice within my recollection.—615. Point Lynus light does not mask soon enough to clear the Dulus Rocks, and hardly enough to the westward. Not during the last 20 years.—616. No. except Invern Deer light, which sometimes appears bright instead of red. North-west lightship broke adrift in 1839 in a gale.—617. I have known the north-west lightship in Liverpool Bay to be off her station during the memorable January gale.—618. North-west lightship parted her moorings in a heavy gale, January 1839, and once since.—619. No.—621. No.—622. No; I think generally speaking our lightships cannot be beat; but make gunners of the crews, it will serve their health.—624. No.—625. No.—626. In the St. George's Channel, south entrance, something is wanted, as there is a great similarity on both sides of the Channel.—627. Not actually seen any lightship off her station; have heard of them being driven away by gales.—628. No irregularity in lighthouses or lightvessels.—629. I have never seen any irregularity in any light on shore; I have heard of a light-vessel being driven from her moorings, but never seen it.—630. I have never noticed any irregularity of any lights, either land or sea, nor have I ever missed a lightvessel from her station; I have heard so.—631. The Seven Stones light-vessel was off her station occasionally soon after she was placed at the station, but now rides safely.—632. No.—633. Never.—634. No.—635. Never.—636. Seven Stones lightship in 1843, and Arklow Bank lightship in 1853.—637. Never.—638. I have frequently noticed great irregularity in both lighthouses at Lowestoft and in the high lighthouse at Orfordness. I also think that the difference in the height of the two at Orfordness is not sufficient. I remember the Sunk lightvessel being once from her station, but so long since that I cannot say when.—639. On or about 1825 the outer Elbe lightship foundered at her moorings; all hands lost. Since that period I have never known her to be absent; but in the ice time I have complained to the Hamburg Senate of the imperfection of her light, and there is now a proposal for her to exhibit three lights to distinguish her from the Weser light. One of the General Steam Navigation Company's ships had very lately a narrow escape from this mistake.—640. Not in English lights. Nore lightship broke adrift about 1823.—641. No.—642. No.—643. No.—644. No.—645. No.—646. No.—647. No.—648. No.—649. Not in England; I have in the English West India Islands. I once knew the Gatt Stream lightship to be out of her place, but cannot state the date.—650. No.—651. Yes, some years ago I have known lights to be eclipsed in trimming them, or even put out, and I recommended a large lamp-light to be used, and to be seen seaward when the Plymouth breakwater light required trimming.—652. No.—654. None, but I have heard of north-west lightship off Liverpool being off her station, having been blown off in a heavy gale.—656. None.—657. Never.—658. No.—660. Never.—665. No.—666. Never.—667. No.—668. No.—671. No.—672.

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Yes, in the case of Ballycottin light, about early part of 1858; the affair was investigated by the Dublin Ballast Office, reported by steamship *Paupo*.—673. No.—674. No.—675. No.—676. No, at times it is difficult to ascertain if one or two lights when first seen; no.—678. Never.—679. Never observed any.—680. No.—683. No.—684. I regret to say that having been for the greater part of the last 20 years employed almost entirely on distant foreign stations, my local knowledge or experience in the English Channel is necessarily much too limited to justify my advancing any opinion on the efficiency of its lighting or buoying.—685. No.—687. Never noticed any derangement or irregularity of any lighthouse, or a floating light to be off her station.—688. None.—689. No.—690. No.—691. The Coningbeg lightship had dragged on one occasion a mile to eastward.—692. Never.—693. No.—694. No.—695. No.—696. Never.—697. No.—698. No.—699. Never.—700. Nil.

701. No.—702. None.—703. No.—704. I have generally found difficulty in first making a floating light, being unable to discover if it be one, two, or three lights, but I do not see how this can be remedied.—705. No.—706. No.—707. Never.—709. I never have.—710. I have known the Kish floating lightship off her station, but do not recollect the date.—711. I have known the Kish floating light off her station, think about the year 1843, but not since, as well as my memory serves me.—714. The north-west lightship at Liverpool, and Kish lightship at Dublin Bay.—715. I have never seen any derangement or irregularity, and have never known a light to go out. I have seen the Kish floating light driven three quarters of a mile from her station six or eight years ago, and have heard that the Saltees lightship was driven from her position.—716. No.—717. North-west lightship at the entrance into the port of Liverpool broke adrift in a heavy gale in 1833, and was towed into port by one of the mail packets *Dolphin*, and was replaced next day.—718. I recollect the north-west lightship in the Liverpool Bay to have drifted once or twice, but cannot remember dates.—719. None.—720. No.—721. Not to my knowledge.—722. I have never known any derangement or irregularity in the lights, but I have known the north-west lightship of Liverpool to be off her station some years ago.—723. The north-west lightship at the entrance into the port of Liverpool broke adrift in a heavy gale in 1833, and was towed into port by the mail packet *Dolphin*, under my command, and replaced next day.—724. I do not recollect any.—725. I have not noticed any derangement or irregularity in the lights near Stromness.—727. There are many lights named in the Mediterranean, which cannot be depended on being lighted.—728. Yes, Fiatholms light, Bristol Channel, twice last autumn, to go out, but cannot recollect date.—729. Never.—730. I do not recollect, at present, any particular light being out of order, but have often been disappointed in not seeing lights in positions where they ought to have been seen. I do not remember what I thought the causes might have been at the time. I never knew a floating light off her station.—731. No.—732. Yes; St. Juan, Porto Rico.—733. Yes; the light at Cape Frio, South America.—735. Not to my recollection.—739. The lights of North-west lightship are irregular, so that, although she may be broadside on, the three lights may not be equally brilliant at the same moment. North-west lightship, in a heavy gale, parted her moorings (January 1839), but was replaced immediately on the weather moderating.—738. I remember the Sunk lightship once breaking adrift from her moorings.—730. I have not.—741. No.—744. I have not myself found any floating light off her station; but I have heard that it has occurred during my service in these seas to the outer floating lights of the sand heads (off the Hooghly Delta), and of Bombay Harbour, and also to that upon the North Sands in the Straits of Malacca, but I cannot remember the periods of their occurrence.—745. I have never noticed any derangement or irregularity in a British lighthouse or lightvessel, nor have I ever known a floating light to be off her station.—746. No.—747. I have known the Southsea Castle light to be out; I have also known the Cape Leve south-west light to be out for twenty minutes. I have not the dates.—748. Yes; the Sunk light was once adrift, and went out some years ago.—749. No.—750. Not amongst the lights of the United Kingdom.—751. The Kish floating light, and the North-west lightship at Liverpool, also the Seven Stones, (Land's End); do not remember dates.—752. Never.—753. Very seldom. I only remember the North-west lightship breaking adrift, from defective chains.—754. Never.—755. No.—756. Saltees lightship cannot be seen well.—758. No.—759. Once, at the Caskets; it appeared as one light for a considerable time, from

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some defect, or want of regulating the machinery (when new). It was set right immediately on my reporting it.—760. I have not in my recollection known any.—762. Not to my recollection.—764. No.—765. I have frequently remarked that the three lights of the North-west lightship (when broadside on) do not appear with equal brilliancy, one or another appearing dimmer than the rest. She broke adrift in the January gale (about 1839).—766. The light upon island of Carigidon, entrance to Manilla Bay, too high; should be upon the Nun Rock.—770. Never.—771. I have never observed any derangement or irregularity in lights either on shore or afloat.—772. I have not any recollection of ever seeing a derangement in lighthouses or lightships; have heard of some, but never experienced any myself.—773. No.—775. I have often noticed the low light on the island of May (Fifeshire) dim, as if a haze was about it, and at times I have been unable to see it at no great distance off, and at the same time the high light was to be seen plain enough.—777. I have never observed any.—779. Never.—781. Very seldom.—783. The lights are irregular at the North-west lightship; whatever position she may be in she never shows the three lights distinctly at the same moment, owing to the arrangement of the reflectors. The North-west lightship broke adrift in the gale of January 1839, and twice previously within my recollection.—784. No.—785. In my experience I have not.—786. I can generally see the high lights on our coast better than the low lights; for instance, I have often seen high lights on Isle of May and Ferns when low lights were invisible.—787. The lower light of the Maidens I have seen frequently almost out, also the river Ribble light, entrance to Preston.—789. Whether from inattention, bad lamps, or oil, I cannot say, (but the lights on the coast of Ireland cannot be compared with those on the coast of Scotland, England, and Wales.) Queenstown Roches Light (seaward red) is the worst, I should say, in existence when bound in for Queens-town Harbour on a clear night, more than once I have made out the buildings before I saw the light; and again, the lights are put out before daylight in some of the light-houses, which is not the case in England, Scotland, or Wales. (This was the case while I served on the coast of Ireland.)—791. Never.

7. What British and what Foreign Light have you usually seen furthest off, an which of the two has been usually visible at the greatest distance?

1. The present South Foreland light and Cape Grisnez light at the greatest distance.
2. North Foreland light.
3. In the duty of my calling I have often noticed the South Foreland and Grisnez lights, the latter generally visible at the greatest distance with a close atmosphere.
4. Cape Grisnez on the coast of France, and Beachy Head on this side of the Channel, as nearly as possible equal in power.
5. The South Foreland and Cape Grisnez. The South Foreland upper light I have seen 40 miles off, and very frequently at 35; Cape Grisnez I have seen at 35 miles, and frequently at 30.
6. The present South Foreland high light is visible at a great distance, and so is Cape Grisnez.
7. Have not made any distinct comparisons.
10. I have seen St. Elmo light, at Malta, furthest off, and the Copeland light (Ireland), and the South Bishop light (Welsh coast), furthest off.
12. Portland high light.
13. Have never compared any.
14. South Foreland lights on the coast of England and Cape Grisnez on the coast of France.
16. I have seen the present high light on South Foreland when off Hastings. Cape Grisnez is a very powerful light.
17. The present upper South Foreland light.
18. Flamborough Head.
20. Lowestoft high light.
21. Flamborough Head, Cromer, Beachy Head, Heligoland, and Naze of Norway.
23. Lowestoft high light.
24. Cromer, 20 miles; Lowestoft, 18 miles.
25. Lowestoft high light.
26. Flamborough Head light I believe to be seen the furthest off, further than Cape Grisnez light in France.

27. Lowestoft high light.
28. Lowestoft high light.
29. Lowestoft high light.
30. Lowestoft high light.
31. The present South Foreland upper light and Cape Grisnez. The present South Foreland upper light.
32. Flamborough Head and Tynemouth (English), and Dunkirk and Cape Le Heve (French).
33. Beachy Head and Cape Grisnez. Cape Grisnez.
34. The British lights most remarkable to me are the Start and Beachy Head lights; these being revolving, break out with a brilliancy superior to fixed lights.
35. Beachy Head, English; Cape Grisnez, French.
36. Cape Grisnez.
37. Beachy Head.
38. St. Ann's, Milford Haven.
39. The Lizard, in England; Goza, near Malta; and Cape Camarat. The two latter are seen furthest off.
40. Lowestoft high light is visible at the greatest distance on this coast.
41. I have not taken notice of these distances so as to form an opinion.
42. Cape Grisnez is a good light. I think South Foreland is the best.
44. North Foreland and South Foreland, and Cape Grisnez, all good.
45. Tynemouth and the Naze of Norway. Tynemouth.
46. Cromer, 20 miles; 18 miles.
47. Flamborough Head and Cromer on the east coast, the North and South Forelands, and Cape Grisnez on the coast of France.
48. I have seen the South Foreland and Cape Grisnez lights a great distance sometimes, but it is all according to the weather; the lights are not always the same. Local knowledge make you see them many ways.
49. Cromer, 20; Lowestoft, 18 miles.
50. The present South Foreland high light is certainly the brightest light I ever saw, and is seen at the greatest distance. Cape Grisnez is the best foreign light I know of.
51. Cromer or Flamborough Head.
52. Although the lights above named are both very good, I think the Start has the best.
53. Lizard, and Calf, Isle of Man.
54. Flamborough Head and Dagerort lights, at the entrance of the Gulf of Finland; the last visible the longest.
55. I have not had any experience in lights this last 20 years, since I have been a Southampton pilot, not at a great distance.
57. Although the lights mentioned above are both very good, I think the Start has the precedence.
58. Lizard, and Calf, Isle of Man.
59. Tynemouth, Flamborough, and Cromer, 18 to 20 miles; Dagerort, Gulf of Finland, 20 miles.
60. Lowestoft high light.
61. British:—Bell Rock, Flamborough Head, Cromer, North Foreland, Dungeness. Foreign:—Koll light, Sweden; Dagerort, Russian. I consider the British lights rather the best, though some of these are good.
62. I do not recollect.
63. The present South Foreland high light.
64. Cape Grisnez, on the coast of France, has hitherto been the most powerful light in this locality; but I have not had an opportunity of comparing it with the South Foreland light as at present constructed.
65. Under different circumstances I have thought the Start light the best.
66. Lowestoft high light is visible at the greatest distance on the coast.
68. Beachy Head and Start lights. Cape Grisnez is a good light, but I give preference to the British lights.
69. Fecamp and Beachy Head lights are seen at a great distance. Cape Grisnez, Start, and St. Catherine lights are powerful lights.
70. Lowestoft high light is visible at the greatest distance on the coast.
71. Lowestoft high light.
72. The Lizard, Tuskar, and Holyhead, Cape Grisnez, Ostend, and Cape Barfleuer. Holyhead.
73. The Start light is the furthestmost light that I know of and have seen.
75. Flamborough Head, and Dagerort, entrance of Gulf of Finland.
76. The Lizard, in the United Kingdom, and the Ceuta, on the coast of Barbary.
77. Cape Grisnez, on the French coast; the Start Point, on the English coast.
79. Cromer, 20; Lowestoft, 18 miles.

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80. Flamborough Head and Beachy Head, English; Fecamp and Ailly, French lights. The English lights are seen the furthest.
81. South Foreland and Cape Grisnez. I think the former; but both are powerful and brilliant lights.
82. Beachy Head.
83. Lundy, and Lizard, and Start lights I have always seen at the greatest distance. Burlingas, on the coast of Portugal, is a powerful light, but not equal to the above lights.
84. Lundy Island, 35 miles.
85. Lundy Island light and Cape Grisnez; the first mentioned furthest.
86. Lundy Island, 35 miles.
87. Start.
88. British.
90. Start.
93. Lundy Island, British, and Cape Ottoway, South Australia, foreign; Lundy Island the greatest.
94. British:—Lizard lights, English Channel. Foreign:—Lights on high land of Never Sink, entrance to New York, United States. I think they can both be seen about the same distance. I have seen the light, when on Cape Clear, as far as any I have seen.
95. Lundy, clear weather.
96. Lundy light.
97. I have seen the South Foreland lights 26 or 27 miles distant. I have also seen Cape Grisnez light, on the coast of France, 24 or 25 miles distant.
98. English.
99. Flamborough Head.
100. Beachy Head.
101. Cannot say.
102. English lights, Flamborough Head and Cromer. Foreign lights, Dagerort, at the entrance of the Gulf of Finland.
103. Cromer in Norfolk, and the Naze of Norway. Cromer.
106. Lundy Island light.
107. Flamborough Head and Cromer. Schowen, on the Dutch coast.
108. Flamborough Head and Schowen light, on the coast of Holland, equal.
109. Beachy Head light, British. Grisnez, the greater distance.
110. Cannot recollect.
112. Beachy Head.
113. St. Bees' Head, Mull of Galloway, and Calf of Man. I think there is little difference.
114. I believe the old light on Cape Clear, Bardsey light, and the Calf of Man light are those I have seen at the greatest distance.
115. The British lights I have seen furthest off are the Mull of Galloway and Calf of Man. The foreign I cannot say which, they being generally so dim.
116. South Stack. Greatest distance, Cape Grisnez.
117. Lizard.
118. Flamborough Head, Spurn, and Cromer, on the coast of England; West Cappell and Schowen, Holland.
119. British lights the best.
120. The Lizard light, at a distance of 18 miles; I have never noticed a foreign light.
121. I always found that the lights on the British coast could be seen at the full distance marked to be seen in clear weather.
122. I am not acquainted with foreign lights.
123. The Lizard light I have seen at a distance of 18 miles. I have never particularly noticed a foreign light.
124. High light of South Foreland, or Lizards, clear weather. Never took that particular notice whether they could be seen further than Schowen light, on the Dutch coast, or Cape Grisnez, on the French coast.
125. The Lizard.
126. Lizard.
127. The present South Foreland high light at the greatest distance, and the light at Cape Grisnez.
128. The present South Foreland upper light and Cape Grisnez. South Foreland upper light.
129. Flamborough Head and Cromer; also good light on Helgoland.
130. Flamborough Head in Yorkshire.
131. Cromer light furthest off, about 22 miles.
132. The Start light.
134. The South Foreland upper light and that of Cape Grisnez. The new Upper South Foreland light, certainly.
135. Beachy Head.
136. Naze of Norway, and Dagerort, Gulf of Finland.
137. British.
138. Ballycotton and Cape Grisnez.
139. The South and North Foreland, Dunkirk Harbour light, and Cape Grisnez.
140. Flamborough Head and Cromer.
141. Holyhead, and Schowen on the Dutch coast.
142. The Lizard.
143. Cromer or South Foreland.
144. The first-class lights on the coast of Scotland are visible as far off as any I know.
145. Cape Clear, Calf of Man, and Mull of Cantire, British; and Highlands of Never Sink, United States, at about the same distance.
147. Kinsale light, about 10 leagues; Cape St. Antonio, Spain, about 10 leagues.
148. I have seen the British lights furthest off.
149. Not able to answer.
150. The Lizard and South Foreland lights I have seen further than any lights, either on the coast of Great Britain or any foreign coast.
152. British lights.
153. France and English in clear weather.
155. Cape Clear.
156. Tuskar, Flamborough Head, and Lundy Island, and Fastnett Rock.
157. South Foreland, and Dagerort light, Finland.
158. Fastnett Rock, about 22 miles distance; St. Anna, north coast, Brazil, same distance.
161. Cape Clear light.
162. Beachy Head and South Foreland.
163. St. Catharine's and Beachy Head, Cape La Heve, and Grisnez.
164. All the new Catadioptric lights are excellent wherever erected.
165. I think the South Stack and Tuskar very good lights. The new light on Mount Video could be seen as far off as either.
166. Lundy.
167. Flamborough Head light.
168. I have seen the light on Goza, the Island of Malta, the greatest distance,—seeing it about 35 miles.
170. I never took particular notice.
173. I am not able to decide.
174. Lizard.
175. I have not taken particular notice.
178. On the coast of England the Start light; the Havana light in the Gulf of Florida.
180. I do not know; but my impression is, that the Tuskar, or the light on Fastnett, are as good as any that has come under my observation.
181. Highlands of New York, South Stack, and Skerries, Ans. Highlands.
183. Cape Clear before removal, and island of Neversink, New York; the former farthest.
185. The greatest distance I ever saw one light was 30 miles.
186. Skellig Bar. Raza Island, Rio de Janeiro harbour.
188. Cannot tell exactly.
189. Flamborough Head, North Rana Ozchein, Beachy Head, Cape Grisnez.
193. The Koll and Flamborough Head.
194. Flamborough Head and Cromer.
195. The Lizard light I have seen furthest off, I think, in the Channel, and Cape Briay, Van Diemen's Land; light on Kent Group Bassett. I have also seen the new Madras light a great distance.
197. I have ran in heavy weather, in heavy gales, and other critical circumstances for the Lizard light with more confidence than I would have done with any other light similarly situated with which I am acquainted, and I have never been disappointed, always having made them at a sufficient distance to secure safety.
198. Beachy Head light the greatest distance. Beachy Head, British; Grisnez, French.
201. South and North Foreland, and Cape Grisnez in France.
202. The Lizard light in England, and the light recently put on Cape Borda, Kangaroo Island, South Australia.
203. I should think Flamborough Head or the Naze.
204. No answer to this question.
205. Flamborough Head and Dagerort.
206. Lundy light in the Bristol Channel.
208. Cannot exactly say whether Barra Head or Dagerort most distance.
209. Beachy Head, Flamborough, Barra Head, and Bell Rock, about 25 miles. Dagerort light, in the Baltic, fully 35 miles.
211. Flamborough Head and Cromer.

213. Tuskar Roads light; Bowlings light. Tuskar usually visible at the greatest distance.
214. Flamborough and Bell Rock.
215. Buchan Ness.
217. I never saw one at a greater distance than Flamborough Head bright light.
218. Flamborough and Beachy Head, Lizard, Cape Clear, Tuskar, St. Paul's, Gulf of St. Lawrence. Our lights are seen much better and further off than foreign lights. I have never been in want of any more lights on any part of our coast or channels.
219. Cromer light on the British coast, and Cape Grisnez on the French coast. Cape Grisnez visible at the greatest distance.
220. Flamborough Head on the east coast, and Lizard on the west coast of England; Cape St. Vincent (coast of Portugal), and Goza, near Malta. Goza light seen farthest.
221. Lundy Island light.
222. British, Flamborough Head.
224. Beachy Head and the Start are the two best lights.
225. Holyhead on the coast of Wales, and the Calf in the Isle of Man, with Lundy Island.
226. Upper South Foreland, and Cromer, and Flamborough; and Cape Grisnez the farthest.
227. Flamborough Head light and Schowen light; but I think Flamborough has the preference.
228. Flamborough Head and Dagerort; but the distance all the principal lights can be seen must be determined by the dip of the horizon, as I have seen all our principal lights dipping two feet above I could see it, and on deck could not have seen Cromer, and Cape Grisnez very brilliant on deck in dark weather.
229. Flamborough Head, as far as the British are concerned; but as regards the foreign, I have no decided opinion on the subject.
230. The Start light in England, Cape St. Vincent in Spain, and those about the Straits of Bonifacio. I think I have seen the latter lights furthest; but the greater clearness of the atmosphere should be remembered.
231. The British lights are generally visible further off than the foreign lights. The lights on the coast of Livonia are next to them.
232. I have seen the light from Flamborough Head, on the British coast, further than any other light; Cape Grisnez light, on the French coast, further than any on the British coast.
233. North Foreland and Bermuda equal distance. Cannot give a preference to one foreign light.
234. Flamborough Head light, north-east coast of England, is the best light, and seen at the greatest distance. Hansholm, coast of Jutland, is the best in that direction, but not equal to the former. There are good lights on each side of the British Channel, but the Lizard is the best.
235. Flamborough Head and Tynemouth Castle, which I have seen nearly 30 miles off, Heligoland about 20 miles.
236. Flamborough Head and Cromer: Schowen, in Holland; Fecamp, in France.
237. The Start and Flamborough Head lights. French lights opposite Dungeness are good.
238. I think Cape Clear is the best light.
239. I think Cape Clear is as good as any I have seen.
241. Genoa, 30 miles; Lizard, 24 miles.
242. Cannot say.
244. North Foreland, seen from Dunkirk Roads (40 miles); Dunkirk, Gravelines, seen from the Downs (40 miles); Grisnez, seen from the Downs (22 miles); South Foreland, west of Dungeness (23 miles).
246. Cannot say, particularly.
247. Cannot say.
248. The revolving light on Beachy Head.
249. Tuskar and Point of Cornwall.
250. St. Anne's light, Milford; Lundy Island; Lizard. The Cordouan, I believe, is visible at the greatest distance.
251. Lundy Island over 30 miles; Highlands (New York), 22 miles.
252. I have seen Beachy Head light at a greater distance than any other light.
253. I have always seen British lights furthest off, such as the Lizard, the Start, Fastness, Skelligs, Mull of Cantyre, and Bardsey.
255. Holyhead.
256. Stack, Holyhead, Cape Clear, Ireland; Mull of Galloway, Scotland; and foreign, Havana; Cuba. The first-named British at the greatest distance.
257. Lizard and Ushant. Ushant.
258. New light on Old Head of Kinsale or Lundy, in the Bristol Channel; Rock of Lisbon, Portuguese coast. Either of the first, although the latter has the advantage of a clearer atmosphere.
259. Flamborough Head.
261. The Lizard, and Cape St. Vincent. The Lizard seen further off.
262. British;—The Old Head, of Kinsale, and Calf of Man upper light. Have not seen many foreign lights.
263. St. Catherine's Point, Isle of Wight; and Cape Grisnez, coast of France.
264. Flamborough Head and Cromer.
266. Lundy; Genoa, Genoa.
269. Flamborough Head on the English coast, Schowen light on the Dutch coast. The same distance.
270. Lizard lights; Genoa. Genoa.
272. Beachy Head, Holyhead, Flamborough Head.
274. Never compared the range of any lights.
275. Lundy Island, and Cape Grisnez. Cape Grisnez.
276. Start and Beachy Head.
278. Never took particular notice.
279. South Foreland upper light and Cape Grisnez equally good; the former much better since it has been altered.
280. Flamborough Head, Lizard, Tuskar, South Stack, British; Cape Barleur, Grisnez, French; Cape St. Vincent, Portugal.
281. Start.
283. I have seen the light on Barra, Isle of Usk, furthest of British lights, and the High Lands of Never Sink America, furthest of foreign lights.
284. Cape Clear and Leighorn lights; the latter seen at the greatest distance on account of the state of the atmosphere.
285. Cape Grisnez in France the most powerful foreign light I have seen. Lizard I have thought the best of English lights. I have seen Cape Clear 30 miles, yet it was generally ill to be seen. Mull of Cantyre, Barra Head, and Cape Wrath, &c. are too high, being often enveloped in fog.
286. I consider Flamborough Head light to be seen furthest off, and no foreign light that I know so nearly equal it.—287. Flamborough Head is the light I have seen furthest off.
288. British light, the Lizard: Foreign light, Barleur, on the coast of France. I think one equal in brilliancy to the other.
289. Holyhead and Naversink. Holyhead.
291. St. Agnes, Scilly, and Cape Grisnez opposite Dungeness. I have seen St. Agnes at greater distance.
292. On the north-east coast, Flamborough Head and Tynemouth, from 25 to 30 miles; on the coast of France, the Cordouan, 30 miles; Heligoland, about 20 miles.
293. Lizard, Tynemouth, and Bell Rock, about 20 miles.
294. Flamborough and the Bell Rock.
295. British lights seen at the greatest distance.
296. Tynemouth and Bell Rock lights about 21 miles.
297. Barra Head light, Lewis Islands, Scotland, and Cape Grisnez, north of France.
298. The Lizard lights.
299. Flamborough Head revolving light I have seen distinct at 20 miles, and Schowen revolving light, on coast of Holland, quite distinct at 23 miles.
300. The Lizards, and Ceuta in Morocco. The Lizards I have usually seen the furthest off.
301. The lights furthest seen by me have been Genoa, Cape Grisnez, and Tuskar.
302. I believe I have seen Beachy Head further than any light in the world.
303. I have seen the Hook Town light at 17 miles distance. Cannot speak particularly as to the distance I have observed other lights at.
304. Lizard lights 30 miles off.
305. Flamborough Head light.
306. British light, Flamborough Head. Foreign light, Cape Grisnez (French light). Flamborough Head light the greatest distance.
307. Not prepared to say.
308. Cape Clear, Lundy, South Foreland, Flamborough, Mull of Galloway, Cape St. Vincent, Lisbon, Pelorus at the Ferro Messina. I have seen the British lights the furthest off.
309. None in particular.
310. I have seen Beachy light at a greater distance than any other.
311. South Foreland and Cape Grisnez.
312. South Foreland and Cape Grisnez. Cape Grisnez.
313. Lundy Island and Cape Grisnez usually.

315. Calf of Man upper light and Sidney Head light; but the Calf of Man at the greatest distance.
316. British light, Lizard; St. Vincent, foreign.
317. The Start light and the High Lands off New York both about equal.
318. British light, Flamborough Head: foreign light, Dagerort, in the Gulf of Finland. Flamborough Head.
320. Beachy Head, St. Catherine, Portland, and the Start; Cape Le Heve, Barfleur, Cape La Hague. Cape Le Heve I have seen the furthest off.
321. Noss Head. Cannot say as regards a foreign light.
322. Flamborough Head on north coast, and Lundy Island, Bristol Channel.
323. Isle of Man, 30 miles; Lizard, 30 miles.
324. Cape Clear and Valparaiso. Cape Clear.
325. Scilly lights are good, and seldom obscured by fog. Berling light, on the coast of Portugal is a good light; but I do not know any foreign light as good as the English.
326. Flamborough Head, east coast of England; Cape Grisnez, coast of France. I have seen the latter furthest off.
327. The greatest distance I ever saw a light was 30 miles; that was Goza light. I have not particularly noticed the distance of the English lights.
328. Flamborough Head and Naze of Norway. Flamborough Head.
329. I can offer no opinion for the reason stated in answer to No. 2.
332. Lizard, and Cape Grisnez in France, when a bright light was seen the greatest distance.
334. I have seen the Calf furthest off in clear weather.
335. Lundy Island. This will depend on the state of the weather.
336. Cromer, Flamborough Head, Tynemouth, Lizard, Forelands; north of France; Dagerort, Gulf of Finland.
337. Flamborough Head light, 25 miles distant.
338. St. Paul's, on the Gulf of St. Lawrence, is quite visible in a clear atmosphere at 10 leagues.
339. Do not remember.
340. Cannot say.
342. I have never taken notice of that.
343. English.
344. Seen Tory Island light at the greatest distance.
345. Lundy Island light.
346. Sandy Hook, United States. Holyhead greatest.
347. Lundy Island can be seen further off than any other, British or foreign.
348. Beachy Head, the Start, the Lizard, Minehead, Mull of Galloway, Cape Grisnez, Ushant.
349. I have seen the Start light a good distance off; but Genoa light, and Porquerelles, on the islands of Hyries (France), a much greater distance.
350. Flamborough Head light and Dagerort light; both are remarkably good lights.
351. Beachy Head and Cape Le Heve. I have seen Beachy Head further in clear weather.
352. About equal.
353. Tuskar light.
354. I do not know of any foreign light visible further than British lights.
355. All very good.
356. British.
358. Beachy Head, Cromer, and Flamborough Head, seen them generally in clear weather 32 miles; Schowen (Holland) seen frequently 30 miles.
359. The English lights are generally seen the furthest.
360. Cannot speak to this.
361. The light on Cape Fria, coast of Brazil, I have seen the furthest off, say 28 miles; but there are those on the Fastness and the Tuskar preferable to the one above, as there can be no mistaking them from any other light, and I have seen them 20 miles off.
363. Cromer light, Flamborough Head, and South Foreland.
364. The Start light, English; Cape Barfleur, French. Cape Barfleur seen furthest.
365. I saw Lundy Island light 28 or 30 miles off on last Tuesday evening, which I think about the greatest limit a light can be seen. The Rock of Lisbon I have also seen a long way off.
366. I am not aware.
368. Lundy and Godrevy.
370. I have seen the South and North Rock, on the coast of Ireland, furthest off.
371. Lundy and the Nash.
372. South Foreland, Cape Grisnez. North Foreland, Cape Le Heve.
373. The same answer as to No. 5 Question.
375. Ballycottin, on south coast of Ireland; Bayona Island, entrance of Vigo. The latter one.
376. Beachy Head and Cape Le Heve much the same.
377. I have seen Tuskar and Cape Clear, now Fasnett Rock, and Calf of Man. Latter seen from the shores of More, distance 12 to 14 leagues.
378. I have seen Lundy light about nine leagues.
379. Lizard. Lizard.
380. Lizard or Lundy. Cape St. Vincent.
381. Lundy, English, about 30 miles; and Isle de Bas, French, about 27 miles.
382. Lizard, English; Cape St. Vincent, foreign.
383. Buchan Ness; Genoa light. The Buchan Ness.
385. Flamborough Head and Calais; the former at the greatest distance.
386. Eagle Island, Arran Island, Skellig Island.
387. British, Flamborough Head and Cromer. Foreign Schowen, coast of Holland, and Scow light, coast of Jutland, equal.
388. Flamborough Head and Dunnet, head of British lights. Oxoe in Norway, Heihzeholm on Gottland, Schowen in Holland.
389. Cape Carbone.
390. Lizard, and Cape Grisnez, and the latter can be seen farther. Beachy Head is seen a great distance in clear weather, but not always to be depended upon.
391. Rock light, Liverpool; in fact all in the Irish Channel are good.
392. The clearest lights are Beachy Head and the Start.
393. I have seen Lundy Island light distinctly 33 miles in very clear weather.
394. Lundy Island visible at the greatest distance. Cape Grisnez, France.
395. The Mull of Galloway. British visible at greatest distance.
396. British.
397. Fastnett Rock, Cape Clear, and the Highlands of Naversink, New Jersey. Fastnett Rock I have always seen at the greatest distance.
398. Mine Head, and Cies Island light, the entrance of Vigo, Spain, seen 32 miles.
399. British.
400. The Skellig (British) I have seen further off than any foreign light I know of.
401. The Start and the Grisnez, of which the Start has been seen the furthest.
402. Best, British; Calf of Man and Tuskar.
403. Lundy Island and South Stack.
404. Lizard, Cape La Hague.
406. Saltees, English; Foreign light, have not taken particular notice.
408. Skerryvore and Cape Otway.
409. The light of Barra Head I have seen at the furthest distance. The light of Burlings is the second I have seen the furthest, on the coast of Portugal.
410. The British.
411. Fastnett Rock, British; Neuveits, Cuba. I think I have seen the light at Neuveits furthest off.
413. The Wicklow light; Mount Desert Rock light, State of Maine.
414. Fastnett and Tuskar.
415. The Lizard light. I do not remember to have seen a foreign light any considerable distance.
416. Cannot say.
417. Holyhead and Valparaiso. British light seen furthest off.
418. To the best of my judgment I have seen the Calf light the furthest visible of any other.
419. Start Point in England; the Moro at the Havanna. The latter is the best of the two.
420. Flamborough Head.
425. Cape Roman, S. C.
427. Holyhead and Isle of Man or Calf of Man.
428. The light on Bermuda can be seen 35 miles.
429. Never took particular notice.
431. Cape Clear, Mantuckie.
432. I would prefer English lights as far as I have seen.
433. Know not of any light to surpass the Tuskar.
434. Ushant, Insterhaul, Wicklow Head, Fastnett Rock, and Tuskar light.
436. I cannot state any particular one.
437. Start Point, Holyhead, and Cape St. Vincent. British lights.
438. Tuskar.
440. South Stack and Ushant furthest off.
441. English lights, Lizard and Tuskar.
442. Lundy Island in clear weather; Tortugal, in Gulf of Mexico.
443. Holyhead and Valparaiso. Holyhead.

144. The Tuskar.
 445. Cape Clear.
 447. Lundy Island and False Point. Lundy Island generally visible at greatest distance.
 448. English lights are usually seen according to scale; foreign lights the same.
 449. Beachy Head, Flamborough Head, Holyhead. Foreign, Cape St. Vincent, Ceuta, and Goza.
 450. Lundy Island, Bristol Channel; Cape Grisnez, French coast.
 451. British.
 452. Lundy and St. Bees.
 454. Not noticed.
 455. In my opinion the British lights in general are seen further.
 456. Cannot say.
 458. Oversall light; Areona light in Prussia.
 460. Flamborough Head and Cape Grisnez.
 461. South Stack and the Ushant. The South Stack.
 462. The Calf of Man light at home, and Bombay light on the Malabar coast; the former visible at the greatest distance.
 463. I think Lundy Island in the Bristol Channel, seen 30 miles.
 465. Cannot reply.
 466. Do not recollect.
 467. Cape Grisnez on the French coast.
 469. South Stack; Bell Isle light, France. Lundy Island, England.
 470. British, Flamborough Head; Ireland, Ballycotton; Cape St. Vincent, foreign.
 471. Cape Spear, Newfoundland; Rock of Lisbon. Cape Spear.
 472. Tuskar in St. George's Channel.
 473. Tuskar Rock light in St. George's Channel, Beachy Head in English Channel. Lundy Island furthest, and Cape Grisnez on the French coast.
 475. The light on Cape Carbon, Algeria, visible further than any English light.
 476. Start light. Bayonna light off Vigo Bay furthest.
 478. St. Ann's, Milford Haven, and Lizard lights.
 479. Beachy Head on the east coast of England; from the French coast, Cape Le Heve. Beachy Head the greatest distance.
 480. Flamborough Head. Naze of Norway.
 482. I think no lights excel the British; the French are equal in brilliancy. Amongst so many good lights I cannot give a definite answer as to visible distance, so much depends on situation and weather.
 483. Black Rock, Tuskar, and South Stack in the Irish Channel, and Pedra Branca in the entrance of Singapore Straits; the latter at the greatest distance.
 484. Cannot say, never having compared.
 485. England's.
 486. Cape Clear, Tuskar, Holyhead; Gay Head, High Land of Sandy Hook, and all the New American lights in the Gulf of Mexico of the first order. Lens lights are equal and some better than the first named.
 487. British, Fastnett Rock.
 488. Cape Clear when lit, South Stack, and Sand Island, Alabama; the latter.
 489. Those in the St. George's Channel of the first magnitude, and those on the south coast of France east of Marseilles.
 491. Fastnett Rock, Old Head of Kinsale, Mine Head, Tuskar, South Stack, Point Lenas, Calf of Man, St. Bee's Head, Mull Cantire, Wicklow; all of which I think can be seen further off than any foreign lights that I have seen.
 492. English Channel, the Start Point, Bristol Channel, Lundy Island, and St. Ann's. St. George's, Tuskar.
 493. The brightest I remember to have seen was Cape Grisnez many years ago. I have seen Lundy Island light in a clear night 45 miles.
 494. St. Agness light, on Scilly, I have seen more than 20 miles off, and Plannier light off Marseilles.
 495. The Calf of Man light, and Cape Grisnez, coast of France. The Calf of Man; but this I attribute to its greater distance.
 496. Most of my experience on the coast of Great Britain has been thick weather.
 497. Lundy Island and the Highland of Naversink New York harbour; the latter seen furthest.
 498. I think Cape Grisnez light, on the coast of France, superior to our lights in general. Holyhead, British; Cape Lagubhas, British Colonies.
 500. I think our lights the most preferable.
501. The Tuskar, in my opinion, is the best light I have seen. Alexandria, in Egypt, is the best foreign light.
 502. Lundy Island, in clear weather, but always capped in hazy weather.
 503. The British lights that I have seen furthest off are the Calf of Man and Mull of Galloway.
 504. Tory, Inistrahul, and Runs Point.
 507. Point of Ayr, Isle of Man.
 509. Holyhead light.
 510. Flamborough Head.
 511. Cromer, Flamborough Head, Hartlepool, Tynemouth Castle, and Heligoland. Flamborough Head seen at the greatest distance.
 512. It depends so much on the state of the atmosphere, with overcast weather, as is often the case with strong south-west winds; the Start, St. Catharine's, and the Isle de Bas.
 515. Tuskar.
 516. The South Foreland, British; and Cape Grisnez, French. Each according to the weather.
 517. Lundy, from its great height (in clear weather only), England; France, Cape Grisnez.
 518. Lundy Island and Tuskar; Lundy furthest.
 519. British, Flamborough Head or Cromer; Bristol Channel, Lundy.
 520. The Calf of Man and Start.
 521. Could not say confidently.
 522. The present South Foreland high light (British) and Beachy Head and Cape Grisnez; the South Foreland being seen furthest.
 524. Capes Le Hague, Le Heve, Belle Isle, Bay of Biscay, and Grisnez; British Channel.
 525. The present South Foreland light and Cape Grisnez. The South Foreland is seen furthest.
 526. Have never taken particular notice, so as to compare. I consider the British lights, in general quite as good, and often better, than other ships.
 527. Flamborough Head and Scaw, on coast of Jutland.
 528. Tuskar Rock and the Hole in the Wall, Bahamas.
 529. The Lizard lights.
 530. Lundy Island and the Old Head of Kinsale.
 531. Beachy Head in England, and the Cordouan Tower in France.
 532. Have never seen foreign lights.
 533. Taking the different states of the atmosphere into consideration, I consider Dungeness as good a light as any on the English coast, and Cape Grisnez on the French. I prefer the former.
 534. North Foreland and Cape Grisnez; the latter visible at greatest distance (about four years ago).
 536. Never observed any particular differences in distance.
 537. Can make no comparison.
 539. Cannot say positively; think white light is furthest seen.
 540. Flamborough Head and Cape Barfleur.
 541. I have seen the Tuskar light 11 or 12 leagues off, and Cape Clear, now Fastnett Rock; also the Calf of Man lights from the coast of France, winter time, a distance of 13 or 14 leagues off, frequently.
 542. Old Head of Kinsale, Tuskar, Holyhead; Cape St. Vincent, Cape Finisterre. English lights, I consider, are to be seen furthest.
 543. Being so long ago, I do not recollect.
 545. Schowen, on the coast of Holland, and Flamborough Head.
 548. Old Head of Kinsale.
 549. Cannot say.
 550. That of Beachy Head, and of Cape Grisnez, on the coast of France. I consider the first one the best.
 551. Flamborough Head, and Butt of Lewis; Dagerort light, entrance to Finland.
 552. It depends, on the elevation, but I generally see the foreign lights as far as the English, if not further.
 553. England, and Foreign, Hamburg Head.
 554. Old Head of Kinsale is very good.
 555. Start Point light; Moros St. Paul's, on the coast of Brazil; and the light on Isle of Bayonne, at the entrance to Vigo Bay.
 556. Cannot say; depends on the atmosphere.
 557. The Start, coast of Devonshire; Cape Grisnez, coast of France. The Start is visible at the greatest distance.
 558. I consider Beachy Head light the most distinct at a distance.
 557. Lizard lights, in the English Channel; and French lights, in general, better than English.
 560. Pertusato light, in the Straits of Benzaico, is the best I have seen. It is visible 30 miles from the deck, and irregular in its revolutions.
 561. Mull of Cantyre light, seen 22 miles off.

7

Question

7

562. The Start light; Bayonne light, off Vigo Bay, 30 miles; Cadiz light, 20 miles; Ceuta light, 28 miles.
564. I think I have seen Cromer light as far as any light on the English coast.
565. I have seen the Lizard lights, in clear nights, 26 or 27 miles off; I have also seen Cape Grisnez, near Boulogne, 28 to 30 miles off, in a clear night; this is one of the best revolving lights in all the channel.
567. The light on Goza, Malta.
568. Start, and Moros of St. Paul's (Brazil), seen at about equal distances.
569. Lundy lighthouse.
570. Start, and Bayonne, coast of Spain.
571. The lights of the present day are of so superior a nature that each, according to height and position, on a clear night, shows a great distance; yet it must be allowed that British coast lights are comparatively more powerful, and more to be relied upon.
573. The Lizard, British; and Genoa, foreign; I have seen Genoa light furthest.
574. Flamborough Head I have seen at the greatest distance.
575. Fastnet, Ballycotton, Mine Head, Skerries; Cape Florida. I consider Fasnet light good.
577. I never made a comparison.
578. Lizard and South Stack, British; Cape Grisnez, &c., French. Genoa light can be seen a great way off in clear weather.
579. Beachy Head, Lundy, and Cordouan (Gironde), and Grisnez.
580. Lundy Island, Bristol Channel, and Belle Isle, coast of France; Lundy visible at the greatest distance.
581. The British lights, I consider, are visible at the greatest distance.
582. The Lizard, on the English, and the light on Cape Grisnez, on the French side of the channel; the Lizard furthest.
583. South Stack (Holyhead); Barfleur, in France.
584. South Stack (I. C.), in clear weather; Cape Barfleur (France); and Ceuta, coast of Africa; Cape Barfleur seen furthest.
585. Ballycotton light; Highland light of Cape Cod; Highlands of Naversink. The American lights to be seen the greatest distance.
589. Holyhead (South Stack), British; Ceuta, Spanish.
590. Flamborough Head, England; Cape Barfleur, France.
591. South Foreland (not observed any foreign light).
593. The Start light in the English Channel and Flamborough Head seen furthest off, the former at the greatest distance.
595. I have usually seen Flamborough Head light on the British coast and Cape Grisnez on the French coast; Cape Grisnez usually the greatest distance.
596. I think the French lights are visible the greatest distance, say Cape Grisnez and the Saints Rocks light, both are fine lights.
597. Hally Head and Tuskar.
598. Beachy Head and Cape Grisnez, the former the greater distance.
599. Cannot positively state at this time.
600. Lizard and Havana; Lizard greatest.
601. Inimstrahul, Skerryone, Barra Head, Ballycotton, Kinsale, Mine Head, South Stack, South Bishop, Highland lights, Fire Island. The lights in the United States are equal to others now.
602. Start and Lundy Island.
603. South Foreland and Cape Grisnez; South Foreland.
604. The Lizard and Dunkirk; the Lizard I have seen at the greatest distance.
605. The Start light I have seen 18 miles off, Raza light, Rio Janeiro, seen 18 miles.
606. Lundy and Barra Head, British; Naze, Norway.
607. Calf of Man lights in clear weather.
608. Calf of Man or Bidston.
610. Stack light.
611. Bidston light.
612. Bidston light.
613. British.
618. Bidston light.
619. English lights are in general seen the furthest.
621. The Hook Tower at Waterford, Cape Grisnez, coast of France.
623. South Stack, Cape Barfleur, and Ceuta, all equally visible under similar circumstances or atmospheres.
624. The light upon Ceuta in the Mediterranean is the most brilliant I have ever seen; but such lights as the Skerries, South Stack, Tuskar, Lizard, and Start, are most efficient, and might appear as good in the same climate.
625. South Stack and Vigo.
627. South Stack (British); Ceuta (Spanish) in Africa; and Goza in Mediterranean. The state of atmosphere may have some influence in the Mediterranean.
628. British, Old Head, Kinsale; foreign, Fire Island light; Old Head visible at the greatest distance.
629. The Lizard lights are to be seen furthest off than any other lights I have seen.
630. I have seen the Lizard lights the furthest of either British or foreign.
631. Cannot positively say.
632. Beachy Head, Cromer, Flamborough Head, and Tyne-mouth I have seen often seven leagues off. Fecamp light I have seen the furthest of any foreign lights.
633. Cromer, Flamborough Head, and Tyne-mouth, six and seven leagues.
634. Cannot say.
635. The Lizard lights I have seen distinctly about 22 miles distant.
636. Lundy Island light with clear atmosphere, Bristol Channel, 30 miles; Cape Grisnez, coast of France, 25 miles. Cape Grisnez usually visible at the greatest distance.
637. The British light I should say is St. Catharine's; the foreign, the lights on the Island of Goza or Alexandria light.
638. Of British lights I think I have seen Cromer furthest off. Of foreign lights, Grisnez, and Grisnez further than Cromer.
639. Flamborough Head is seen as far off as any light with which I am well acquainted on our coast, and further than any I know on the opposite coast.
640. South Stack light, Holyhead; New York lights.
641. Beachy Head, Lundy Island, Start Point, the light on Isle Dieu, Isle Planier, Cordouan tower, Saintes, all seen till they dip out; French lights brightest.
642. The late trial of the electric light at the South Foreland was the one seen at the greatest distance; the others are about on a par with the first-class lights in France.
643. Where the lights generally are good it would be difficult to fix on any one in particular, perhaps, in preference to others, though it may be possible.
644. Lundy Island, Bristol Channel.
645. Start light when the weather has been clear; light on the Morro of San Paulo, Brazil. I have seen the latter light 26 miles off.
648. The Start light and the Moro light at the Havanna; but I consider the latter the best light.
649. Grisnez (French), Tuskar, South Rock, Rathlin, Beachy Head.
650. Ceuta light in Mediterranean; Barfleur light in France.
651. I considered the light at the French lighthouse at the entrance of Bordeaux river one of the best in 1814, and at least equal to our Lizard light.
652. Start Point light and Cape Pertusato in Straits of Bonifacio, the latter always seen furthest off, possibly from having the greatest elevation.
653. Flamborough Head; Ushant, which I have seen at greater distance.
654. The Caskets and Barfleur. These lights I have seen farther than any other, considering their elevation. Ballycotton lights I consider the best in the Irish Channel. I do not think so much of the Fasnet two lights far apart on Cape Clear, one a flash and the other steady would have been better than the Fasnet.
656. The Start and Cape Grisnez, both equally visible from my experience.
657. The light on Beachy Head, and the light on Cape Grisnez; the latter is the stronger light of the two, and can be seen furthest off.
660. Start Point and Cape Roca. Have seen the Start light furthest off.
665. Dagerort, in Gulf of Finland.
666. The lights of the English Channel I have generally seen furthest off.
667. Lizard, Beachy Head, and Cape Barfleur, doubtful which is best.
668. Lizard lights and Ceuta light. I have usually seen Ceuta light furthest, as the atmosphere is generally very clear.
669. Cape Grisnez, the two South Foreland, the Lizard, and the New Bishop lights have appeared to me to be the best. The light on the Bishop is I think the best I have seen.

671. The Lizard high light and Beachy Head light on the English coast, and Cape Grisnez on the French coast. I think I have seen Beachy Head light furthest off.
672. British ; Lundy Island before any other.
673. The Calf of Man, and Cape Grisnez, coast of France.
674. The Lizard and Cape Grisnez. I am doubtful which of these lights I have seen furthest off.
675. Cannot say.
676. Lizard lights, and Ushant. Lizard has been visible at the greatest distance.
678. Lizard lights, and Cape Grisnez. The latter I think is the brightest, and seen further.
679. Start light, Cape Antonio, Cuba.
680. Cannot answer from memory, and have no dates. My impression is that Raza light off Rio de Janeiro is the best foreign light that I have seen.
683. Beachy Head light, the Lizard, and the Start I have seen at a greater distance than any foreign light.
685. Lizard lights. I know of no light on a foreign coast to compare with it.
686. Lundy Island light ; Cape Grisnez, coast of France. Lundy light furthest seen in clear weather.
687. Lizard lights.
688. The Lizard and Ushant.
689. Cape Grisnez, France ; Lundy Island light, Lundy Island.
690. Lizards I have seen at the greatest distance ; Cape St. Vincent.
691. Ballycotton light seen at greatest distance ; Boston outer light good ; Cape Pini, Newfoundland, good.
692. South Foreland, and Cape Grisnez.
693. The Lizard lights, and Cordouan (entrance to the Garonne) ; the former are very good lights, but the latter is seen at the greatest distance.
694. Fastnet Rock, and Tarifa, Straits of Gibraltar ; the former visible at the greatest distance.
695. I think you see the Lizard lights as far any.
696. Lizard ; Calais, and usually visible at the greatest distance.
697. Beachy Head ; Monte Video seen at greatest distance.
698. The Baltic ; French lights in the Channel and Portuguese are, as far as my judgment will permit (having seen the latter a few times), equal to our lights, and seen as far.
99. The Start, Beachy Head, and Cape Grisnez ; but have not seen the Needles light.
700. Lizard lights and Start light ; Gibraltar and Alexandria on the coast of Egypt ; the British lights being usually visible the furthest.
701. I do not remember.
702. Beachy Head and Vigo ; Vigo.
703. The lighthouse on Gibb's Hill, Bermuda.
704. Lundy Island light, and Cape Grisnez. Lundy has been visible usually at the greatest distance.
705. May Island light furthest off, fixed light. Cape Grisnez, revolving light.
706. Beachy Head, Monte Video ; the former the greatest distance.
707. I have not had many opportunities of forming an opinion.
708. Cromer or Foulness light greatest distance ; Cape La Heve, in France.
709. South Foreland and Cape Wrath, Cape Grisnez, and Dunkirk ; South Foreland and Cape Wrath the furthest off.
710. The South Stack at Holyhead.
711. The Stack light at Holyhead.
712. British light seen furthest is the South Stack.
715. The Stack of Holyhead, Tuskar, and the Fastnet Rock are the British lights I have seen furthest off.
716. Holyhead, and Bailey in Irish Channel.
717. Cannot say.
718. Bidston and the rock in Liverpool Bay ; Bidston visible furthest off.
719. Cannot say.
720. British lights, South Stack and Flamborough Head ; French light, Ushant, the greatest distance.
721. Lundy Island, Bristol Channel, South Stack, St. Georges, Flamborough Head, North Coast ; Ushant I have seen the greatest distance.
723. Cannot say.
724. South Stack.
726. The Lizard, English ; Cape Barfleur, French.
727. The light on Ceuta, opposite Gibraltar, and Start Point lights, are to be seen a great distance, but I think Ceuta the best.
728. Ballycotton flash light, Irish coast ; Lizard, English coast ; Sanguinaire, island of Corsica ; Ballycotton.
729. Start light, coast of Devonshire ; light on Bayonna's entrance to Vigo Bay, coast of Spain. The Vigo light visible the greatest distance.
730. I have not noted these points, and seldom been in positions to ascertain the exact and greatest distance from any lights. The light at Cape Grisnez appeared very bright a long way off.
732. British (Bermuda).
733. Have seen the revolving light at the Mons San Paulo (Brazils) farther off than any English light.
735. The state of the atmosphere so often varies, that with any certainty I could not state any particular one.
736. The Madras light is a splendid one ; I have seen it from aloft 30 miles.
737. Bidston light, or the South Stack.
738. Cromer, on the coast of England, and Cape Grisnez, on the coast of France.
741. Cromer.
742. Beachy Head, and Belle Isle ; I prefer Belle Isle.
745. I have seen the Start, the Calf of Man, the South Stack, Corsewall light, and the Needles (on a very clear night) a long way, but I have seen Cape Camaret and Porquerolles much further.
746. Flamborough Head, bright light.
747. The Cape La Heve and Fecamp lights are seen in ordinarily clear weather eight to nine leagues ; I have seen them a much greater distance, and on one occasion as much as 40 miles.
748. The Bermuda light I have seen about 24 miles off.
749. The Needles light, when on the cliff, clear weather, full 30 miles ; the light on Cape la Heve, in clear weather, between 30 and 40.
750. The lights which I have made at the greatest distance are the ones on Cape Grisnez, and the light on the Cios Islands.
751. The Lizard (Land's End), and South Stack (Anglesea).
752. This depends on weather mainly. English lights are best.
753. The worst piece of legislation was in altering the old Trinity rules for ships and steamers meeting. All the improved lighting will never compensate for this blunder. Laws that apply to steamers only should not include sailing ships.
754. I have seen the lights on Bermuda bearing N.W. by N, in 24 miles difference of latitude, which is further than I recollect to have seen any other.
755. Lizard's and Holyhead.
756. Old Head of Kinsale.
758. Lizard, Ushant, Corinna, and Ceuta lights.
759. Beachy Head and Cape la Heve ; Cape la Heve seen farthest.
763. I do not at present recollect.
761. The following, in the order put : Loop Head, Hook Tower, Tuskar, Clare Island, Clew Bay.
762. To the best of my recollection, the Porquerolles light, on the south coast of France, is the best I have seen. The Start light the next.
763. The Start and Beachy lights, Kent's Group, in fine weather often seen from 30 to 40 miles, in dirty weather never visible.
764. The Start in England, and Cape la Hogue in France.
766. I consider the light upon the Burlings, coast of Portugal as good as any I have seen.
767. Madras Light I have often seen 30 miles from aloft.
770. I have seen most of the channel lights from the mast-head of large ships quite bright in clear weather directly they were above the horizon, and long before they could be seen from the deck.
771. Bonifacio Light, on Cape Pertusato, Corsica, and the Start Point light. I have seen both lights from a ship's deck 20 miles.
772. Tuskar, Skerries, Point Linas, Lizard, Start, Ushant, all first rate.
773. The Lizard or Start, and Isle de Bas ; Lizard visible at the greatest distance.
774. Cromer, in Norfolk ; Cape Grisnez, in France.
777. Cannot say which I have seen furthest off.
778. South Foreland and Calais, Foreland farthest off.
779. Portland and Caskets.
783. Calf of Man.
784. St. Agnes, Scilly ; Planier, near Marseilles. The first.
785. Cape Clear and Barfleur lights ; Cape Clear the greatest distance.
789. British invariably.
790. I have seen Lundy Island upper light the furthest of any British light, and Corduan light in the entrance of the river Gironde the furthest of any foreign light, and the latter the furthest of the two.

8

Question

8

8. Have you ever felt a want of Lighthouses or Floating Lights on any part of the Coast or in any of the Channels of the United Kingdom?—if so, where?
1. I have not.—2. No.
 3. Yes, for many years I felt the want of a lightvessel at the east end of the Tongue, and also at the Girdler, the both of which have been for some years placed at those points.
 4. I have not.—5. No.—6. No.
 7. Yes; but the omissions have been attended to, as in the cases of the Cork Ledge, Cockle, and Gunfleet lightvessels, and of those shore lights which have recently been established in Zetland, and upon our east coast.
 8. Yes, in Broadhaven Bay; but a harbour light has been placed there within the past four years, which remedies the defect.
 9. Yes. To mark the entrance of Forrey harbour.
 10. No.
 12. On Berry Head.
 13. In Galway Bay, to guide between Black and Margaretta Rocks. On Straw Island, Killarney Bay, Aranmore, Galway. In nearly all the harbours and roadsteads round the coast.
 14. Formerly, but not now.
 16. The whole of the coast that I pass is well lighted now.
 17. No, except on the Varne.
 18. Since 1834 have not been at sea, cannot say now.
 20. No.—21. No.
 22. A channel light at Ilfracombe, in the Bristol Channel.
 23. No.—24. No.—25. No.
 26. No, not any where, except near the Outer Dowsing.
 27. No.—28. No.—29. No.—30. No.
 31. No; except the Varne.
 32. There has been that want on the North Hinder, but now a lightship is placed there.
 34. I do not know the want of any light in the district for which I am licensed.
 35. No.
 36. In the straits of Dover, on the N.W. part of the Varne. I have often thought of communicating with the editor of the "Shipping Gazette" upon the subject.
 37. No.—38. No.
 39. Yes. A floating light on the Shambles, two leading lights by night into Plymouth Sound, by the western passage, and the same for Southampton Water.
 40. There is no particular want of any more lighthouses or floating lights between Lowestoft and Gravesend.
 41. No.
 42. I think a light would be serviceable on the Varne.
 43. No.—44. No.—46. No.
 47. A floating light placed near the north-west part of Varne would be of great advantage navigating this part of the English Channel.
 48. This question I cannot or do not properly understand. Some, perhaps, would like to have a light every fathom, others can do without it, therefore I cannot answer.
 49. No.—50. No.—51. No want.
 52. Yes; whilst in charge of ships taking the harbour of Exmouth by night, when a lighthouse on Strait Point, as before stated, would be a great boon.
 53. Wolf Rock.
 55. No.
 56. Southampton Water.
 57. Yes; whilst in charge of ships taking the harbour of Exmouth by night, when a lighthouse on Strait Point, as before stated, would be a great boon.
 58. Wolf Rock.
 59. No.—60. No.
 61. I have often thought it would be a desirable thing to place a floating light near the Outer Dowsing; many ships have been lost there it is to be feared, and their crews; also the south end of the Shipwash.
 62. No.—63. I have not
 64. I am of opinion that a floating light off the south-east point of the Goodwin Sands would materially assist the navigation at the back of the sands, and prevent many serious losses.
 65. Yes; when in command of vessels taking the bar at Exmouth.
 66. I do not see any occasion for any more lighthouses or floating lights between Lowestoft and Gravesend.
 67. No.—68. None.—69. No.
 70. I do not see any occasion for any more lighthouses or floating lights between Lowestoft and Gravesend.
 71. No.—72. No.
 73. The Hanois of Guernsey. But there is one, I know of no want anywhere else.
 75. No.—76. Not particularly.
 78. Yes; a floating light at the N.W. end of the Varne.
 79. No.
 80. I have felt a want of both on all parts of the coast and channel that I am acquainted with, but that does not now exist, it having been remedied by the corporation of Trinity House, London.
 81. None.—82. No.
 83. None. I think our coast well lighted now.
 84. I have not.
 85. Yes, on the west Scarweather sands.
 86. I have not.—87. No.
 88. In the channel, from Maulhead to Kirkwall, Orkney, and on the Cross sand of Yarmouth, Norfolk.
 90. No.
 91. On the west coast of Scotland.
 92. Want of lighthouse on the north point, and beacon on the Monkstone.
 93. I have, on the west end of the Skerweathers.
 94. I have never felt the want of any lights. I consider them well lighted.
 95. Morthoe Point, West Skerweathers. Morthoe Point especially.
 96. Morthoe Point; also a red light in the Naish Tower, as a guide to keep clear of Breaksea Point.
 97. No, none.
 99. A floating light on south end of Cross Sand; a floating light at the Goldstone, near Holy Island; a light in place of the beacon at Ancsar Rocks, Firth of Forth.
 100. No.
 101. See No. 3.
 102. On the Varne Sand off Dover.
 103. No.
 104. Every voyage during the winter months I feel the want of a light on St. Abb's Head, and a floating light at the Plough Rock, Holy Island, or leading light through the Fairway.
 105. There should be a floating light at south end of Codling Bank; between it and north side of South Ridge there is a deep channel 3 miles wide. The Codling Bank has a buoy on it now, and is a most dangerous bank from its form and position.
 106. On Mort Point.
 107. No.—108. None.
 110. At one time there were lights required in the Swin to Queen's Channel; that defect is certainly now remedied, or seemed to be last year, when I went to the continent.
 111. As already stated, one in Lynn Roads, or at the Wisbeach Bar buoy, would be very serviceable.
 113. No.—114. No, none.—115. Never.
 116. Often, in reaching in towards the Irish land of Blackwater, and on the south side Bristol Channel from Mort Point.
 118. No.—119. No.—120. Never.—121. No.—122. No.—123. Never.—124. No.—125. No.—126. No.—127. I have not.
 128. No; except the Varne.
 129. No.
 130. I was the chief mover in getting a lightship placed on the Bahama Bank, Isle of Man; lighted, I think, in January 1846.
 131. A light and buoy are wanted in the Outer Dowsing, bearing 15 miles N.N.E. of the Dudgeon, and 45 S.S.E. of Flamborough.
 132. On the Varne.
 133. Gore or Hook off Margate Sand.
 134. No; although sometimes I have fancied a light on the S.W. end of the Varne, where the buoy is now, might be of service to those persons who could not obtain the services of a pilot.
 135. No.
 136. North end, Inner Dowsings.
 137. Yes, leading lights at the Cockle entrance to Yarmouth Roads.
 138. No.
 139. Considerable benefit would be afforded by a floating light being appointed on the flats near the west last buoy at the entrance of the Horse Channel.

II.

3 R

140. On the north end of the Inner Dowings.
 141. No.—142. No.
 143. South-west end of the Barnard.
 144. I have frequently felt a want of lights in the Minch, but it is now well lighted.
 145. I never have.—147. No.—148. I have never felt the want of any lighthouses or floating light.—149. Never.—150. None.
 151. Wolf Rock, entre les îles Scilly et Longschèp, où il n'y a qu'une bouée, il y aurait grand besoin d'un feu.
 152. No.—153. No.—156. No.—157. Never.—159. Not for the last six or eight years.—160. No.
 161. Ormes Head.
 162. Not being acquainted with the coast, cannot tell.
 163. Yes. A floating light ship is wanted on the Shambles, another on the outer part of the Inner Dowings, and a lighthouse five miles south of Humber.
 164. No time left for due consideration, going to sea.
 165. I have not of late years found any want whatever of lighthouses or lightships in the channels or coasts of the United Kingdom.
 166. No.—167. No.—170. None.—172. No.
 174. Not recently.
 175. I have not.—177. No.
 179. Grassholme Island.
 180. I think the English coasts are all well lighted.
 181. No.—183. No.
 185. I leave that to your countrymen.
 186. No.
 188. Not in Great Britain; but there should be one light on the south of Bornholm, and one on the coast of Jutland, about Røbsnorth or Hartshals.
 189. No.—191. No.—193. No.
 194. Yes. Outer and Inner Dowings.
 195. No.
 196. Formerly, Point, Liverpool, one of the first class, and the entrance of the Queen's Channel.
 197. I have often felt the want of a floating light in the Fairway, to the southward of the shoals off Beachy Head, say at about three miles outside the outer shore. Was a float placed there, and burn a blue light every hour during the night, as do the Calcutta floats, it would be next to impossible with ordinary care, even in the thickest weather, for a ship to pass without its being seen and run on shore on the French coast; and would, if in existence, in all human probability have prevented the greater number, if not the whole, of the wrecks and consequent loss of life on the French coast within the last few years, occasioned by ships passing Beachy in hazy weather without seeing it. Besides, Beachy Head light is entirely useless for proceeding down channel, until the danger it was intended to guard against is passed. The float to be placed sufficiently far south to allow for any slight error or errors arising from indifferent compasses, local attractions, careless or bad steering, or error in judging the distance off shore when passing the Wight or St. Catherine's Point lighthouse. It would be equally useful for ships bound down channel, and would, I think, do away with the necessity of Beachy Head light altogether. Though not coming strictly within the limits of the question, I beg leave to suggest a most important addition to the usefulness of Dungeness lighthouse, viz., a time ball to be dropped every hour between sunrise and sunset. It would be of more practical benefit to shipping than all the rest of the time balls at present in the United Kingdom put together. I have frequently felt the want of such a convenience when bound outward in winter time, and no opportunity of solar observations. No one with experience of the working of chronometers will rely on the rates received with them from the shore; their removal, change of temperature, and other influences to which they are liable, will in nine cases out of ten alter their rates. I have seen and possessed three box chronometers, and good instruments too, as was proved by their previous and subsequent performance, which in consequence of removal by rail from Fenchurch Street to Blackwall, went wild to an extent of more than a minute in a day for the first day or two. By getting their errors on passing Dungeness, even without a rate, they will be of much service in a short voyage, and if an opportunity offers, say at Madeira or Canaries, to obtain sights, a sea rate will be obtained which is not likely to alter much afterwards. I feel satisfied that if the experiment was made with the Dungeness lighthouse, it would be found so beneficial that the system would soon be extended to several of the other lighthouses, say, for English Channel to Start Point and Lizard, and but little ingenuity would be required to adopt it to night-time signals as well as day. It would not only benefit ships from English ports, but also all ships from Baltic and German ports bound south or west.
198. No.
 199. When in the Liverpool trade we felt the want of a lightship off the Bahama Bank, and the lights at Portpatrick after it was discontinued, but is now relighted again.
 200. I think there should be a light at Great Ormshead.
 201. None in particular.—202. No.—203. Not lately.
 204. Yes; a want of a floating light off the Outer Dowings shoal, S.E. of Flamborough Head. Very much in the fairway of navigation on that part of the coast.
 205. Montrose Ness is in want of a light.
 206. No.
 208. A light much required at Montrose Ness in the winter season, when ships running down with a southerly wind. Ships often get to leeward before they can see the leading lights.
 209. A lighthouse on Montrose Ness.
 211. A floating light on the Heaps where the beacon buoy is now placed.
 212. A floating light would be of much service placed on the north end of the Outer Dowings. I would also recommend that rockets be exhibited on board the Dungeness floating light.
 213. The coasts above referred to are generally well lighted.
 214. Montrose Ness, much wanted.
 215. No.
 216. Would suggest two leading lights (inland) for the Cocklegate.
 217. All parts of the coast I consider well lighted, where I have sailed.
 218. I have never been in want of any more lights on any part of our coast or channels.
 219. I have never felt a want of lighthouses or floating lights in any part of the British Channel.
 220. Experienced the want, or loss, of Cape Clear light when running for the west coast of Ireland, the Fastness light not being seen so far.
 221. No.—222. No, not personally.—226. No.—227. Never.
 228. I was master in 1831, since which time many lights have been established, all of which are highly valuable. I know parts where lights are urgently required. Does Whitby pier light burn all night? it should. A floating light would be of service on the north end of Sizwell Bank, between the Nesses, and in the vicinity of Blackwater Bank, where the ill-fated passenger ship *Ponona* was lost.
 229. No.
 230. No. The old Needles' light was bad, but the new one is very good.
 231. No.
 233. Near the outer Gunliva.
 234. I do not know of any particular light required at present, except on the Inner or Outer Garbard, on the north-east end.
 235. Not of late years.
 236. Cross Sandhead, a lightship; and Filey Bridge, east coast, a lighthouse.
 237. Not since steam became general.
 240. I have felt the want of a lighthouse on the east side of the Firth of Clyde, from Corswell Point to Cumbra Head.
 241. Turnbury Point and MacCormick Island.
 242. Never.
 243. At Montrose, also Firth of Forth.
 244. Yes; a floating light in the Straits of Dover. Between Ridge and Varne ships frequently strike.
 247. No.—248. I do not know the want of a light.—249. No.
 250. Yes; I often felt a want of a light at the Land's End, near the Rudleston, and another on Kemeshead, entrance to Cardigan harbour.
 252. I have never felt a want of lights on any part of the English coast in the English Channel.
 253. Never experienced any want of either.
 255. In Drogheda Bay.
 256. Yes; Langness Point, Isle of Man.
 257. River Shannon on Scatry, and Breaksea Point in Bristol Channel.

8

Question

8

258. Want a light on Black Head, north side of Belfast Lough; Scotch mail steamer *Stag* got on shore there in March 1857, also other steamers. Also a light on Turnberry Point, Ayrshire coast, Scotland.
259. A light on the Inner Dowsing would be of great service.
261. Have several times found the want of a light on the S.W. end of Guernsey.
262. Yes; previous to lighthouses being erected on the Isle of Sana, Rachlan Island, Skerivore, all in north channel, and Skelligs, south-west coast of Ireland, and Blackwater Bank, and now Fife Ness, east coast of Scotland.
263. Yes. A bright light on Ilfracombe, near Devon, as a channel light.
264. North end of the Inner Dowsing.
266. No.—269. No.
270. Mort Point, North Devon.
274. I think a floating light is desirable about midway between the South Bishops and Bardery, 10 miles north of the entrance of Cardigan.
275. Wolf Rock.
276. No.—277. I have never felt want in any part of the channel I have been in.—278. Not to my recollection.
279. Yes; a light would be of great service on the Tiraght, westernmost island of the Blaskets, west coast of Ireland, to one side the Foze Rock, there being no light between Skelligs and Loop Head, and a great angle. A small light on south end of Scattery, Shannon, and that river should be buoyed. The light at Samphires, Tralee Bay, is hardly visible till close to it; it is hardly visible more than a mile.
280. No; except on the island of Guernsey.
281. No.
282. Skerries Park Rush, Rathlin Sound, Lough Strangford entrance, Lough Carlingford.
283. Yes; in running in for the Shannon or Galway Bay. A light on one of the outer Blaskets would make it much safer at night.
284. No.
285. Many, but now supplied. A float would be very useful at Outer Dowsing shoal. A light is much wanted on Oxcar's Rock, Firth of Forth; perhaps also on Fifeness.
286. St. Abh's Head, or the south-east way of the Firth of Forth, and Oxcar Rock in the Forth.
287. In the sound of Isla, the sound of Jura, the State Isles, Stovehead, the Butt of Lewis.
288. Never.—289. Never.
291. I have always felt the want of a light upon the westernmost island of the Blaskets, west coast of Ireland; as also upon the south-west point of Scattery, in the river Shannon.
292. Of late years I have not.
293. No.—297. No.—298. No.—300. No.
301. Put a light on the Wolf Rock and you have a guide to all the channels.
302. I felt the want of a light in St. Alban's Head last week. If the least haze is on you may be abreast of St. Albans and not see either the Needles or Portland lights, therefore unable safely to take the shelter of Portland harbour.
303. Never. — 306. Never. — 308. No, never. — 309. No where.—310. No.
311. Off the south-east spit of the Goodwin Sands, to fire minute guns in thick weather.
313. No.
314. A lightship wanted on the west end of Scarweather Sands, off Swansea Bay.
315. None.
316. Wolf Rock, south-west of the Longships.
317. I must say that my opinion is, that a good floating light should be placed on the "Varne," and think it would be the salvation of many lives and much property, having myself been on it, before the buoy was placed, twice. I repeat, it would be exceedingly useful.
318. I have never experienced the want of light, excepting at the Varne shoal in the Straits of Dover, where I think a lightvessel would be of great service.
319. The Inner Dowsing.
320. The harbour light at Weymouth was out several nights last winter.
321. No.
322. I have lost many tides from want of a light on Straight Point, near Exmouth Bar.
323. No.
324. Yes; at the north end of Blackwater Bank, which is outside the range of Tuskar, and Arklow float not visible.
325. No. During the last few years several important lights have been placed.
326. No.
327. I have not, most times being in the foreign trade, I have not much experience of pilots' waters.
328. Inner Dowsing.
329. I have not.
330. Yes, on the Foze Rock, off the Blasket Islands, county Kerry, Ireland.
331. No.
332. Not of late years, there being so many new lights.
334. I have felt the want of a light on the Chickens as I have come through the Sound, and not seen either lights or houses.
335. Wolf Rock, near the Land's End, Cornwall.
336. North-east end of the Inner Dowsing and St. Abh's Head.
337. A light was wanting off Whitby, which is now supplied.
338. A floating light is very much required at Monvuagon shoal, in the Gulf of St. Lawrence, in thick weather; vessels passing up and down often go on shore for the want of such, or an alarming bell, as guns are on Black and Green Islands.
339. Not of late.
340. I have not.
342. Not on any part of the coast that I am acquainted with.
343. Never.—345. No.—346. No.
347. Yes; a light is much wanted on the island of Grassholm, near the Smalls, for the navigation between Milford Haven and Ireland.
348. Yes; on the outer extremity of the South Rock Reefs, south-east coast of Ireland.
349. Yes; at St. Alban's Head, and along the coast between Start and Portland.
350. Never.
351. Not since the lighthouses on the Start and St. Catherine's Point have been erected.
352. No.—353. None. — 354. No.—355. No.—356. No.—357. No.
358. I have felt the want of some to show the south end of Harborough Sand.
359. None; except the Channel Islands.
360. Certainly not in the British Channel.
361. None; for in any thing like clear weather, I can say for these few years past, before losing sight of one I picked up another.
362. Yes; a light is very much required on Canaghsharra Point, between Sligo Bay and Killala Bay.
363. Yes; on Straight Point, near Exmouth Bar.
364. Want of a light on St. Alban's Head.
365. Not for some years.
366. Much wanted at Turnberry Point, 5 miles north of this place.
367. On the west end of the Scarweather and the west end of the Culvers, in the Bristol Channel.
368. I have. Mort Point.
369. I have not.—370. Never found any.
371. I have. Mort Point, north coast of Devon.
372. No.
374. I have observed a great want of guiding and directing lights and signals in the approach to harbours. I consider there is a want of prominent lights in Tees Bay.
375. On Foze Rock, off Blaskets, west coast of Ireland; on a Durse Island, same coast.
376. No.—377. No.
378. A lighthouse on Morte Point, a floating light on the Scarweather Sand.
379. Yes; on the tail of the Scarweather Sands near Swansea, and the Rundlestone, as before mentioned.
381. On the east end of the Shambles, and on the west end of the Varne.
382. Yes, on the sands called Scarweather, off Swansea, and Rendlestone.
383. In the East Swin, and off Yarmouth.
384. There is great inconvenience on the coast I have named.
385. Yes; in the lower part of the Thames, the Swin, and the Humber some years back, but think all those places are sufficiently lighted at the present time.
386. No.—387. No.
388. Yes, between Flamborough Head and Spurn; and recommend the Grimsby dock tower to be lighted. It can be seen 30 miles off, and could be seen at the Dudgeon.

389. On the Wolf Rock, a lightvessel off the Sarn Badrig Sand, and a lightvessel midway between Tuskar and Holyhead.
390. St. Alban's Head. A lightship on the Shambles and on the Varne, and perhaps the Royal Sovereign Shoals at Beachy Head.
391. Dunaney Point, on the east coast of Ireland, entrance to Dundalk Bay, entrance to Liverpool, west end. At West Hoyle, heavy weather N.W. ship cannot be seen any distance.
392. No.
393. Morte Point, and west end of Culver Sand, Bristol Channel.
394. On the east end of the Shambles, near Portland.
395. Yes; at Great Ormshead, in North Wales.
396. Never.
397. Yes; on North Arran Island, north-west of Ireland.
398. No.—399. No.
400. I think a light upon the Baskets on the west coast of Ireland would be very serviceable; I have not generally otherwise.
401. On the Irish and Scotch coasts formerly.
402. None.—403. No.—404. No.—405. No.—406. No.—407. No.
408. A light is much wanted on the north end of King's Island, Bass Straits.
409. Never.—410. No.—411. No.
412. Poa 51° 58' Bog, 2° 3' L.O. Greenwich, benaint "Ydre Gabhard."
414. Never.—415. I have not.—416. No.—417. I have not.—418. No.—420. No.—425. No.
427. Yes, on the Blackwater Bank, previous to the stationing the present lightship there.
428. I should think there is enough in the George's and south coast of Ireland. Too many is as bad as too few.
429. No.
431. A lighthouse is much wanted on the mainland, inside the Blackwater Bank; with a light equal to that of Cape Clear (stationary light), it would be a great boon.
432. Not latterly. Formerly a want, but now supplied.
423. Never; so long as I had a deep sea lead and line.
434. On the Black Rock of Oehill, N.W. of Ireland, and the entrance of Boumon, island of Islay.
436. No.—437. No.—438. No.
439. Borough Head.
440. No.
441. Guernsey.
442. No.—443. Never.—444. No.—445. No.—446. No.—448. Light wanted on Ormshead coast, Caernarvon. A gun to be fired every half hour in lieu of the blue light, which is burned every two hours in foggy weather, at the Liverpool N.W. lightship.
449. None.—450. No.—451. No.—452. No.—453. Never.
454. Running in Pakfield Gate.
455. No.
456. St. Abb's Head, north coast of Scotland.
457. No.—458. No want whatever.—459. Never.
461. In Caernarvon Bay.
462. No.—463. No.—465. No.—466. No.—467. No.—468. No.—469. No.—471. No.—472. No.
474. Some years past when coming along shore to the westward, passing inside Sovereign Shoal at Beachy Head; but now, Eastlavin being lighted up, serves every purpose.
475. I think floating Fernoy lights would conduce much to the safety of the English Channel.
476. St. Alban's Head.
478. At the west part of Nash and Sear Sands.
479. Yes. To the entrance of Boston Deepes very useful.
481. I have, in Cardigan Bay. I think a lightship on the west end of the Causeway and another on the west end of the Patches would be the means of saving many ships and lives.
482. I think a light to guide between the South Track and Fork Spit of the Goodwin Sand would be very useful.
483. I have not.—484. No.—485. No.
486. I have, until the ship was placed on Blackwater Bank; and would like to see a better one on Arklow.
487. I do not recollect at present.
488. Never.—490. Never felt a want of lighthouses or floating lights on any part of the coast, or in the channels.—491. None.—492. No.
493. On the coast of Ireland, from Cork to Waterford; which is now filled up by Ballycotton and Minehead lights.
494. I have often felt and seen the want of a light in St. Ives Bay.
495. Previous to placing a lightship on the Blackwater Bank, I have felt the want of one in that locality.
496. No.
498. Yes; running from Cork Harbour for the Scilly Islands, the light on St. Agnes is not generally seen from the deck.
499. No.
500. From my experience and attention in any of the channels, I must say no.
501. Very much, between Jary Island and Rathlin O'Birne Island, in looking out for the land in westerly and north-westerly gales.
502. No.
503. I have felt the want of a light very much in the Sound of Rathlin; a light on Sheep Island would be of great service to the steam and coasting trade.
504. No; using the necessary precautions.
505. A lightship off Lytham Bank I have often need the want of, instead of the Nelson buoy.
507. On the north side of entrance to Belfast Lough.
509. No.
511. Yes; the Outer Dowsings; also the Swain Heaps.
512. No.
513. St. Abb's Head.
514. Morte Point, entrance of the Bristol Channel, light-house.
515. The upper light on the Calf of Man ought to be placed on the Chickens.
516. No.
517. Floating light wanted on west end of the Culver Sand, Bristol Channel.
518. A floating light on west end of Culver Sand; and a bell buoy on One Fathom Bank required.
519. At the present day, none.—521. No.
522. Two leading lights in the Cockle, into or out of the Yarmouth Roads; and a light on St. Abb's Head I have greatly felt the want of.
523. The want of a light on the west coast of Zetland has been severely felt by many vessels.
524. Never.
525. Two leading lights through the Cockle into or out of Yarmouth Roads.
526. Yes, on the west end of the Scarweather Sand, Bristol Channel.
527. I have felt the want of a light on St. Abb's Head; entrance of Firth of Forth.
528. From information received from experienced coasting masters, well acquainted in the channels, a light in the south bay of this port would be of the utmost importance.
529. None.
530. I have, in the Gulf of St. Lawrence.
531. Not of late.—532. No.—534. No.
535. A floating light on the Inner Dowsing is much required, in navigating Lynn and Boston Deepes, would also be serviceable to vessels navigating between the Humber and Yarmouth Roads.
536. No.
537. Yes. I felt the want of a light upon Sgeir Moal, Sound of Jura: I felt the want weekly. Sgeir Moal is, in my opinion, the most dangerous rock between the limits specified in No. 1. There was one steamer, full of passengers (300), wrecked upon it, the *Chester*, and many a steamer struck a narrow escape in passing it. I think a light is more needed here than on any of those new proposed places upon the west coast.
539. St. Abb's Head. The lower light in the fairway should be moved west, to make, along with the high light, leading lights through that channel. A light, instead of the beacon, on the Oxcars, in the Firth of Forth; guiding lights on Fifeness, for the purpose of clearing the Carr Rock; a light on the Butt of the Lewes.
540. Yes; on the north-west coast of Guernsey.
541. The lighthouses at the entrance of Carlingford Lough are good lights, and judiciously placed as a leading mark, running in for Carlingford Lough, day or night.
542. Not on the coast of the United Kingdom. Very great want of lights in the colonies.
543. Yes. Highland of Scotland; east, north, and west coast of Zetland.
544. No.
545. Inner and Outer Dowsings.
546. Yes; I think if there were some leading lights on Yarmouth Downs, for the Cockle Gat, would be the means of keeping ships from getting on the Scorby Sands, &c. I think, if a floating light were on the Inner Dowsing, would be very useful, and of great service for the Deepes, &c. I would suggest, say, a red light.

548. Loch Strangford.
 549. No.—550. No.—552. No.—553. Never.
 554. Between the Tuskar and the Welsh coast.
 555. Yes. When arriving with the Brazil and West India mail, have often felt the want of a floating light on the Thorn Bank. If a light was placed there, it would, when arriving at night, frequently be the cause of the mails being landed several hours earlier.
 556. No, I have not.
 557. On the Hanois, on the west end of Guernsey.
 558. When the new float at the Shambles is placed, I do not see the necessity for another anywhere in the channel, except at the Hanois, Guernsey.
 559. Yes; would recommend a light on the east land of Mount's Bay, by opening of the same to clear the Rundlestone Rock. And likewise a revolving light on the Shambles, between Portland and St. Alban's Head.
 560. No, having been many years absent from England.
 561. In the Sound of Jura, on Skein Marble Rock, Ruisdor Island, and north entrance of Oban Bay.
 562. Yes; between St. Alban's Head and Durlstone Point.
 563. Yes.
 564. Yes, I have a long time felt the want of a floating light off the Cross Sand, and I think a light at the Outer Dowings would be of great service also.
 565. I think lightships are much wanted on the north side of the Varne, Straits of Dover, as these shoals are very dangerous to all vessels, more so to large ships.
 566. Outer Dowings, Boston Bar, Cockle Gat.
 567. No.
 568. Frequently felt the want of a floating light on the Thorn Bank, on the Solent, when arriving with the West India or Brazil mail at Southampton during the night, and if one were placed there it would often be the means of having the mails landed some hours earlier.
 569. No.
 570. Frequently felt the want of a floating light on the Thorn Shoal, in the Solent, when arriving from the West Indies and Brazils with the mails. A light on the Thorn would be of great advantage to the mail packets arriving, and would often facilitate the landing of the mails, particularly in the winter.
 571. On St. Abb's Head, where there is now one in construction.
 573. No.—574. No.
 575. Light much wanted upon the Bull, Cow and Calf, west coast of Ireland; Arklow and Kish Banks. Likewise a lightvessel between Tuskar and the Welsh coast, as a guide in thick weather.
 576. Arranmore, Ireland; and Sheep Island, in the Sound of Ruthlin.
 577. Very much in the Coningbeg.
 578. Yes, on Great Orme's Head.
 579. Yes; prior to the time of those floating lights, which have been established within these last 25 years.
 580. Yes. Morte Point, north coast of Devon; and Fowey Harbour, south coast of Cornwall.
 581. I am not aware of any part in need of a lighthouse or floating light.
 583. A light on Three Stone On, and one on the Wolf, or Gol Pedan Penrith (Land's End).
 584. Land's End.
 586. A lighthouse wanted on Orme's Head; a floating lightvessel in place of the bell buoy at the entrance of Liverpool.
 589. Yes; Wolf Rock, in going round the Land's End.
 590. Yes; on the north-west end of Guernsey, now, I believe, in contemplation; also on the south-east side of Yarmouth Sands.
 591. Yes; on my passage to and from the Bristol Channel, where the Godrevy Island light is now erected.
 593. I have at one time, but not now.
 594. Lighthouses wanted:—At Start Point, and at Breaksea Point in the Bristol Channel, and at the entrance of Ferry Harbour. I have been obliged to keep at sea in a gale of wind many times, which I should not have done if there had been a light to point out Ferry Harbour. At two different times, in gales of wind, that I have been off Ferry, in the night there were vessels driven on shore close to the eastward of the entrance of Ferry Harbour: one was called the *Shepherdess*, loaded with teak, from foreign, some of the crew drowned; the other, at another time, was called the *Comet*, of Southampton, loaded with flour, all hands drowned. Either of these times we could have run for Ferry Harbour if there had been a light there.
595. I have felt the want of a floating light at the outer entrance of St. Nicholas Gatway as a guide for ships passing outside of the rapids in stormy weather.
 596. Never.—597. Never.—598. Not for many years.—599. I have not.—600. No.
 601. I have often felt the want of a lighthouse in place of the lightship off Coningbeg, and of a lightship at Blackwater Bank.
 602. Berry Head, Torbay, Dodman Fishguard, Scomar Island, and up Milford Haven.
 603. I have felt the want of a floating light to clear the Varne and Ridge in the Straits of Dover.
 604. I have felt a want of a light on Breaksey Point in the Bristol Channel. I would recommend a light on the Spit of Passage at Waterford Harbour.
 605. In running from Portland for the Needles at night in hazy weather I have thought a light at St. Alban's Head would be useful, but perhaps the new light at Needles may alter the case.
 606. Yes; a floating lightship on the west end of the Causeway, Cardigan Bay.
 607. A pile lighthouse on the west end of Hovle Bank. A lightship at the entrance of Queen's Channel, River Mersey, Beaumaris River.
 608. Yes; a lighthouse should be placed about Walton, or the north wall of Liverpool Docks to act with Rock lighthouse for Rock Channel, and to lead up Crosby Channel.
 609. A light on Orme's Head is much wanted. A floating light instead of the bell buoy, Queen's Channel, would facilitate the navigation of the Mersey.
 610. On Orme's Head, or on west end of Hoyle Bank. A floating light at the entrance of the Mersey [in place of a bell beacon. Leading lights for Beaumaris River.
 611. Yes, in Orme's Head. A floating light at entrance of Queen's Channel; leading lights up Beaumaris River.
 612. As a pilot I have not.
 613. Yes, on the Varne Sand. I refer especially to merchant vessels, where good leadsmen are rare, and where, from their having so few men, they are soon done up, especially during the long winter nights, and when, from the state of the weather, the Foreland and Dungeness lights cannot be seen.
 614. Yes, on the Orme's Head. Lights are much wanted for Beaumaris River, to lead up the channel.
 615. A lighthouse on Orme's Head would be of importance to navigation. It should be masked, so as to give warning when approaching Constable Bank. A lightship should be placed where the bell beacon now is.
 616. A light on the Orme's Head. A lightvessel in the place of the bell beacon.
 617. I have felt the want of a light on the Great Orme's Head.
 618. Yes, on the Orme's Head, and at the bar of the Queen's Channel, Liverpool.
 621. Shambles, off Portland.
 622. A light would be very useful outside the west end of West Hoyle, between the north-west lightship and Orme's Head, as the current setting into the River Dee is apt to take a vessel on that dangerous Hoyle Bank.
 623. In running from Liverpool to Havre in a steamer I have felt the want of a light on Seven Stone Oar or near. In crossing Bristol Channel with a south-west gale and spring flood, the Longships may easily be shut in if sufficient allowance be not made. A stranger would not make enough.
 624. A lightship instead of the bell buoy at the entrance of the present principal channel to the port of Liverpool would be a great advantage.
 625. No.
 626. A light is much wanted either on the Stock or Skerries west of the Pentland Firth, also near the North Carr Rock, on the east of Fife, Scotland.
 628. I have felt the want of a light on the Stag Rocks, St. George's Channel.
 629. Yes, the Outer Dowsing, 16 miles from the land, with 2½ fathoms.
 630. Yes, one on the Outer Dowsing.
 632. Yes, west end of Outer Dowsing, the straightest passage from the Yorkshire coast to Haisborough Sand End being to the eastward of the Dudgeon Shoal, and particularly with easterly winds.
 633. On the northward of the Outer Dowsing.
 634. No.
 635. A lightvessel would be very servicable on the Varne or Ridge.

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636. Blackwater Bank, coast of Ireland, was much wanted, now happily established; also the lights in Sea Reach and Princes Channel. Warner Light, eastward Isle of Wight.
637. Yes; very great on St. Alban's Head, and on the Bramble Shoals (north-west end).
638. Running constantly between London and Edinburgh, and passing at the back of Yarmouth Sands in the night, I every bad night feel the want of a light outside and near the north-east Cross Sand, and submit whether if one were placed there the light at St. Nicholas could not be dispensed with. A light at the Outer Dowings would also be a great boon to all coasters, particularly to loaded colliers.
639. Many years ago I have felt great wants, particularly between Orfordness and Harwich, but these have been since supplied. I made many representations on the subject.
640. A light on Orme's Head, and a lightship instead of the bell beacon, Liverpool. Also on the Ve Skerries, Shetland, west coast.
641. A light would be useful on Grassholme, off Milford Haven, on the Dodman Head, and on Morte Point, in the Bristol Channel.
642. Not of late years.—643. Not to my present recollection.—644. No.
645. I consider that a revolving light on St. Alban's Head would be of great service for "steam navigation."
646. I have felt the want of a floating light in the Strait of Dover.
647. On the Great Orme's Head.
648. A lightship on the Bramble would be very useful for all steamers bound to Southampton at night.
649. I think Dungeness should be a better light; and I think a lightship on West Hoyle would be valuable.
650. No.
651. I have often sadly wanted lights in our old wars, when "channel groping" in dark and hazy nights; but now we are so well provided that the lead is sadly neglected, and losses arise on that account.
652. No.
653. On the western part of the island of Guernsey.
654. Lightships on a line of the headlands off Cardigan and Carnarvon Bays would be of great service, and I have seen the want of them.
656. None.
657. I have frequently experienced the want of a light to guide into Spithead by night; but this is now obviated by a lightvessel having been placed near the Warner Shoal.
658. No.—660. No.
665. Varne, in Straits of Dover.
666. No, not in the parts of the English Channel I am acquainted with.—667. No.
668. No, except near the Shambles, where a lightvessel is about to be placed.
669. I have frequently felt anxious when running up, with the wind southward, for fear of getting embayed near the Needles. The light standing so high is frequently obscured.
671. No.
672. Yes, on the island of Grassholme.
673. Yes, on the island of Grassholme.
674. No.
675. Shambles.
676. No.
677. As above stated, I have seen the want of a light on Strumble Head, near Fishguard Bay.
678. Yes, on the Wolf Rock.
679. No.—680. No.—683. No.
685. Yes; east end of Shambles, and Royal Sovereign Shoal.
686. On Shiant Isles, in the Minch.
687. Yes; on passing the Shambles; also the Royal Sovereign Shoals, coming down at night from Dungeness.
688. No.
689. Shambles, near Portland.
690. For entering Portland at night clear of the Shambles.
691. No.—692. Never.—693. No.—694. No.—695. No.
696. Never since the light has been placed on the Bishop, off Scilly Islands.
697. Yes, on the Brisons; for in thick weather sometimes Longships cannot be seen, and would tend to keep ships clear of Wolf Rocks.
698. Not in the English Channel.
699. The only light required is that proposed for the Shambles; that is, concluding the Needles light answers the proposed purpose of clearing Durlleston Point, on which point I suggested to the Trinity Board to place a light, as St. Alban's Head, and that neighbourhood is a difficult navigation for the strength of the tides.
700. Nil.
701. I think a lighthouse on the Wolf Rock would be of great utility.
702. South-west end of Guernsey.
703. I think not.
704. I have not experienced any want of lights, &c.
705. Floating light at south-west end of Gull Stream floating light near the Keeps in Swin Channel.
706. No.
707. Yes; floating lights on Royal Sovereigns, Shambles, and Rundlestone would tend in a great degree to the safety of vessels navigating the channel.
708. North end of the Outer Dowings, on the east coast.
709. On the east end of the Shambles.
713. At Dublin a better light on the north side of the channel, situated between Pigeon House and the North Wall End in place of the present one, which cannot be seen in any haze, and is so similar to lightships.
714. A lightship at Spencer's Spit, entrance to Rock Channel, Liverpool.
715. I have often felt the want of lightships at Coningbeg and Blackwater Bank before lightships were placed there; but am of opinion that the Blackwater lightship should not be lit with a revolving light.
716. Yes; a better light on the north side of Dublin River, between the Pigeon House and North Wall lighthouse.
717. No.
718. Yes; on the Levan Spit, between Puffin Island and Beammaris.
719. I have much felt the want of a light on the Rockabill.
720. No.
722. Not any place that I can think of.
723. No.—724. None.
725. A light is much required in Holborn Head, Caithness, low down, to guide vessels to proper anchorage ground, in the night time in Scabster Roads. Dermot Head light is of no use in this respect.
727. For vessels running in channel I think there should be a light somewhere about the Bolt Sail.
728. Yes, a floating light off the Foreland, Bristol Channel; a spar, at least 20 feet above high-water mark, with a large ball on it, on centre of Monkstone Rock, Bristol Channel, and a beacon on the Hook Buoy.
729. No.
730. I remember very little now where I thought lights would be of service, and could not say the positions without referring to charts and notes taken at sea. I have found the want of one outside the Cross Sand off Yarmouth. I would have preferred the Newarp light in that position.
731. No.
732. Yes, off Shambles.
733. Yes, during the existence of the red light on the cliff at the Needles.
735. I am not aware that I have particularly.
737. Yes, on Orme's Head; at the entrance of the Queen's Channel, River Mersey; leading lights up Beaumaris River.
738. On St. Abb's Head, entering the Frith of Forth, and at the outside of Yarmouth Sands, near the Cross Sands.
741. The Outer Dowings.
742. Outer Dowings, North Sea.
745. Not since the Needles light has been moved down to the rocks.
746. The Cross Sand off Yarmouth, and the Outer Dowings.
748. As mentioned in answer to Question No. 3.
750. The Dodman, Penlee Point, Berry Head, and Bembridge Ridge.
752. Never.—754. I have not.—755. No.—756. None.—758. No.
759. St. Alban's Head.
760. I have frequently found the greatest want of a lighthouse on the most western rock of the Baskets, the Tiraught Rock, when bound to or from the Shannon.
761. A red light and a beacon by day was, and perhaps still is wanted, on the Omearth Rock, Carlingford Bay; and also at Foynes, and in Dungarvon Bay, on Carrickapane Rock. See 23.
762. For reasons before given, no.—763. No.
764. I think leading coloured lights in the channel of Little Russel, in Guernsey, are required.

765. A lightvessel in Cardigan Bay; a light on the Orme's Head; a lightvessel on the entrance of Queen's Channel, River Mersey; leading lights up Beaumaris River.

766. No.

769. A lightship is much wanted West End Wash Sands, British Channel. A red fixed light is much wanted on Grasshallow Island, off Milford Haven, for the protection of coasters in general passing through the islands in dark weather, and a bell or gong in thick weather; this is of the greatest importance, not more so in the three channels. I had much experience in this part while in command of a mail steamer between Milford and Waterford; this I have often mentioned to many of the authorities at Milford.

770. The turning point at Calshot Spit is very badly defined at night.

771. No.—772. No.

773. Yes, one to define the channel between the Brambles and Calshot shore (entrance of Southampton); one required on Hanois Rock, Guernsey; one on Corbiere (Jersey). I also think a light on St. Clement's Island (western entrance of Mount's Bay) most desirable, not only as a night mark to clear Wolf Rock to the eastward, but also to warn a ship of her position should she of a dark or hazy night be standing into Mount's Bay, where there are formidable dangers. Such a light, when seen from inside, might also serve to guide clear of the Lowlea and Cambrose.

774. I have frequently felt a want of a light on the north end of Outer Dowsing, North Sea.

775. I have often felt the want of a light when rounding the North Carr (Fifeshire). The low light on the Island of May is too far off the danger it is intended to clear; it can only be seen in the clearest of weather.

776. Yes, in the North Sea (viz.), floating light near the north end of Outer Dowsing Shoal.

777. I never felt a want of any.

778. Outer Dowsings; a light there would be of great service, as I have sounded in two fathoms. I often have ships 22 feet water in charge.

779. No.

780. At Lochendahl, Island of Islay.

781. I think a light in lat. 49° 30', lon. 8° W. would be very useful in running into the English Channel in winter.

782. Yes, in Rathlin Sound (coast of Antrim), in Lough Strangford, and Lough Carlingford.

783. I have not felt such a want; but a light on Orme's Head would be very useful to strangers, as also two leading lights for Beaumaris River, and a floating light at entrance of Queen's Channel, River Mersey.

784. No.—785. I have not.

786. In the trade I am at present in I find a great want of a light on the North Carr, or the coast against, to know when to round it.

787. Very much so on the Black Rock off Achil Head.

789. Yes.

790. On the approaches to Liverpool, say a light on the Orme Head, or a lightship on the Constable Bank and one at the entrance to the Queen's Channel.

791. Never.—792. No.—793. No.

from any ship or shore light.—17. In the neighbourhood of the Downs it is, in my opinion, their power should be increased in order to distinguish them more satisfactorily from the ships' lights in the roadstead.—18. Since every ship must carry lights, cannot say.—19. Yes.—20. Yes.—21. Yes.—22. Yes.—23. Yes.—24. Yes.—25. Yes.—26. I think that the floating lights cannot very well be taken for ships' or shore lights.—27. Yes.—28. Yes.—29. Yes.—30. Yes.—31. Yes.—32. Yes.—33. I do not think the present float lights are sufficiently brilliant to distinguish them from the shore or ships' lights.—34. The floating lights have a sufficient brilliancy, except in extreme cases, hazy weather, which, of course, cannot be remedied.—35. Our floating lights are very good, but ships' lights are too brilliant, especially the lights used at anchor.—36. I believe they are, and I think the Trinity House has taken every precaution in that respect.—37. Yes.—38. Yes.—39. I think they are.—40. Our floating lights are generally very brilliant and clear, and are so distinct from ships' and shore lights that we do not often make any mistake in them.—41. I think a greater distinction should be made, as I have often been in doubts whether it was a floating light or a ships' light that was seen.—42. Yes.—44. Yes.—45. Yes.—46. Yes.—47. Yes; I never experienced any difficulty in recognizing their distinctive character.—48. Yes; Yes; I think the present arrangement of the lightvessels are very justly adapted for the purpose they are intended for.—49. Yes.—50. I do.—51. Yes.—52. Yes.—53. Quite sufficient.—54. They are good, but it would be much better, where it is possible, to show bright revolving lights, to distinguish from sailing ships.—55. Yes.—57. Yes.—58. Quite sufficient.—59. Yes.—60. Yes.—61. I think our floating lights are capable of improvement, at all events they ought to be superior to all ships' lights.—62. I do.—63. I do.—64. I am of opinion that the floating lights are sufficiently bright for the purposes for which they are intended.—65. Yes.—66. Our floating lights are generally very brilliant and clear, and are so distinct from shore lights and ships' lights that we do not often make a mistake in them.—67. I do.—68. Yes.—69. Yes.—70. Our floating lights are generally very brilliant and clear, and are so distinct from ships' and shore lights that we do not often make any mistake in them.—71. Yes.—72. Many of the lightships exhibit but one light or two, and, I think, would be easier distinguished if three were shown.—73. They are sufficiently brilliant, and not to be mistaken, for they are larger, and placed in a peculiar position.—74. Yes.—75. I think that floating lights ought to be revolving to distinguish them from vessels' lights at a distance.—76. Yes.—77. Bembrige floating light, at the east end of the Isle of Wight, not sufficiently distinct.—78. Yes.—79. Yes.—80. Yes, I do.—81. I do, since the adoption of the present system of signal lights for sailing vessels.—82. Yes.—83. I think that Arklow and the Kish light ought to be improved more powerful.—84. Yes, with caution.—85. I do.—86. Yes, with caution.—87. Yes.—88. Quite sufficient.—90. Yes.—91. In order to prevent as much as possible the mistaking of a ship's masthead light for that of a lightship, I would suggest that blue should be substituted for the present bright light of the former; for, although it has not yet been considered applicable for distance, it might be made sufficiently marked for that required by the Admiralty regulations.—92. Yes.—93. Yes, with caution.—94. I think them sufficiently brilliant and distinct in character to prevent their being mistaken except in thick or hazy weather.—95. In the late improvement in ships' lights, I nearly mistook a ship's light for the Holmes light.—96. Yes.—97. I do consider them so.—98. Very good lights what I have seen.—99. Yes.—100. Yes.

102. Quite perfect.—103. Yes.—104. Yes.—106. Yes.—107. Yes.—108. Yes.—109. All except the Owers light, which has one light; screw steamers masthead high might be mistaken for it.—110. Those I have lately seen appeared to me very good; ships carrying so many lights now seems to me an evil.—111. I have experienced some difficulty with the Bull Float, at the entrance of the Humber, to distinguish it from ships' lights.—112. Yes.—113. I think them generally sufficient.—114. Yes, quite.—115. I do.—116. There is not enough distinction in the whole of the lightships, there should always be one coloured light with white eyes, or the bright lights to be put triangular.—117. Yes.—118. Yes.—119. Yes.—120. I do.—121. Yes.—122. I think they are sufficiently brilliant.—123.—I do.—124. Yes.—125. We have no floating light.—126. Yes.—127. I do.—128. Yes. 129. Yes.—130. Yes.—131.—Not sufficiently distinct, they ought to be double, say a bright and a coloured light, in order to make them distinguishable from ships' lights.—132. The Owers, as stated above, and to burn a blue light or maroon every half hour, as the lights at the entrance of the Hooghly and Bombay.—134. Yes, I do.—135. Yes.—136.

9. Do you think that the Floating Lights generally in the United Kingdom are sufficiently brilliant or distinct in character to prevent them from being mistaken for Ships' Lights or Shore Lights?

1. I do.—2. Where there is a floating light near a roadstead there is often a difficulty in distinguishing a brilliant ship's light from the lightship, viz., the "Mouse."—3. I always find them sufficiently distinct at all reasonable times.

—4. I think the Owers light an exception to the generally excellent floating lights on the coast. I think it ought to be more distinctive in character and of greater brilliancy.—5. Yes.—6. Yes.—7. I think they are, but the risk might be still further avoided by a more liberal use of rockets or blue lights in misty or obscure weather; the number of rockets sent up at intervals to correspond with the number of lights carried by the vessel.—8. Yes.—10. Yes.—12. Yes.—13. There are no floating lights on the coast of Ireland with which I am intimately acquainted.—14. Perfectly so.—16. I think them sufficiently brilliant to distinguish them

I think not possible.—137. I do.—138.—Yes.—139. I have always found them to be sufficiently brilliant.—140. I think not possible to mistake them.—141. Yes.—142. Yes.—143. Yes.—144. Yes; generally in clear weather.—145. I think they are.—147. Yes.—148. I think the floating lights are sufficiently brilliant to distinguish them from any other lights.—149. I do.—150. Yes; if the two are of equal distance I should know the light of our floating lights from that of a sailing ship's light; but as all lights dim in proportion to distance, so that a sailing ship's light may often be taken for a floating or shore light.—152. Yes.—153. No.—155. I mistook the light on Blackwater Bank for the Wicklow lights, and had I not gone aloft and caught a glimpse of the Tuskar, serious consequences might have happened.—156. Yes.—157. Yes.—158. Lights of Blackwater Bank lightvessel not safe, as one is a revolving light. Believe some will not observe the difference between it and Tuskar, especially in hazy weather; and that the *Ponoma* was lost in consequence of that revolving light. Believe three fixed lights in triangle more suitable.—159. From my experience I think they are.—160. Yes.—161. I consider the light on Blackwater Bank has been taken for Tuskar, it being a flash or revolving light.—162. Yes.—163. Some of them are, some not; the Dudgeon, the Sunk, and the Mouse are not good enough.—164. Great care ought to be taken not to mistake the dipping in the sea of floating lights for a revolving or flash light.—165. I have never found any difficulty in distinguishing them from ships' lights or shore lights.—166. No.—167. Not at a distance beyond eight miles.—168. I think they are sufficiently distinct; the best to my knowledge being the New Land, mouth of the Humber.—170. Yes.—172. No.—175. I do.—177. Yes.—178. I do.—179. I do.—180. I do think that some of the floating lights are rather dim, and are often mistaken for ships' lights.—181. All except Blackwater Bank boat, which should be two revolving lights, the same as the Calf of Man lights, no mistake can then be made.—183. Yes.—185. They are brilliant and distinct.—186. I think some of the floating lights are wanting in brightness, as the Coningbeg, off Saltee Island.—187. Yes.—189. Yes.—191. Yes.—192. Yes.—193. Yes.—194. Yes.—195. In the British Channel I think they are.—196. Yes.—198. Yes.—199. They are known from shore lights, being nearly always in motion.—200. Yes.

201. The South Goodwin.—202. They might be more brilliant, but they are generally and easily distinguished from having more than one light of the same colour, while those of steamers or sailing vessels are of various colours.—203. Yes.—204. Yes.—205. Depends upon the atmosphere.—206. Yes.—207. I think them efficient in every respect.—208. Yes, according to atmosphere.—211. Yes.—212. Yes.—213. I have myself frequently been unable for a time to distinguish between the floating lights and ships' and steamers' lights when making for Liverpool, and I think there is room for improvement in the system of floating lights.—214. Yes.—215. No.—217. I think so.—218. I do think they are sufficiently brilliant and distinguishable from ships and shore lights.—219. I think there cannot be any improvement on the floating lights on the British coast; I have never been mistaken with ships' lights or shore lights, but I have been with the fishermen's lights in the season, Frenchmen.—220. I think not sufficiently, it being sometimes difficult to distinguish them from ships' or shore lights.—221. Yes.—222. Yes.—224. The Needles light (red) is very similar to a steam vessel, and it would be a great advantage if it revolved.—226. Yes.—227. Decidedly they are.—228. I have seen many of the floating lights dipping a few degrees in my altitude, putting them in and out (or visible and invisible); they could be improved, but they are superior to ships' lights at present; but much depends on cleanliness and attention.—229. Yes.—230. I do not know sufficient of floating lights to answer this question.—231. Yes.—232. In my opinion, I do not think there can be any improvement in the floating lights.—233. They are.—234. I do not know that there are any of the floating lights but what may be clearly distinguished from ships' lights or lights on shore.—235. At a distance on a clear night it is sometimes difficult to distinguish them, and always thought ships' riding lights and fishermen's lights ought to be blue to make a distinction.—236. An improvement is very desirable.—237. You would do great good to colour the white lights, sufficiently distinguishable from our own plain white lights.—238. Quite distinct.—239. I think so.—240. Yes.—241. Some of them not very distinct.—242. Yes.—244. Mouse light, West Swin, not sufficiently distinguished from ships at anchor.—246. Yes.—247. Sufficiently brilliant.—248. I think they are sufficiently brilliant and distinct in character.—249. Yes.—250. I think they are.—251. What I have seen of them so far does not enable me to think the

contrary.—252. I have mistaken ships' lights for floating lights, and think it desirable that the latter should be as brilliant as possible.—253. I think they are extremely well arranged.—255. Might have red or green splash lights to show hourly, instead of two hours, as some have adopted.—256. Yes.—257. No.—258. In case of three lights, the centre one should be higher than at present, as when "end on" they appear like one. Kish, Irish, and North-west (Liverpool) lights are, for above reason, not so easy to distinguish.—259. Yes.—260. Impossible to mistake them.—261. Quite sufficient.—262. Yes; but if they could be made more brilliant it would be an improvement. I have seldom seen a light from a lightvessel more than a few miles.—263. The floating lights are good, and require no alteration.—264. Perfectly so.—265. Most decidedly so.—266. Yes.—268. Yes.—269. Yes.—270. I do.—272. Yes.—273. I think they are.—274. I think they are.—275. No.—276. Yes.—277. I always found it easy to distinguish floating lights from ships' lights or lights on shore.—278. Yes.—279. Yes.—280. I do.—281. Generally good.—282. Yes.—283. I think with proper attention no mistake of that kind need occur.—284. Generally they are, but the Arklow Bank lightship is not distinct enough; it should have three green lights of strong magnitude.—285. Yes; but steamers' lights are often too powerful, and are mistaken for floats or shore lights when seen in showery weather; hence many mistakes from multiplicity of lights.—286. I do think they are sufficiently distinct.—287. I think they are sufficiently distinct.—288. To the best of my knowledge I think the floating lights generally in the United Kingdom to be sufficiently brilliant to prevent misconception.—289. Yes.—291. I think all floating lights sufficiently brilliant to distinguish them from ships' lights or shore lights.—292. I do.—293. Floating lights are often mistaken for ships' lights.—295. Yes.—296. Floating lights are apt to be taken for a ships' red light.—297. Quite sufficient.—298. From Scilly Islands to the Start Point are sufficiently brilliant, that I think they cannot be taken for ships' lights or shore lights.—299. I have always found them answer their purpose, and cannot see who they could be mistaking for shore lights on account of the motion, and their brilliancy always exceeds the sailing vessel.—300. Yes.

301. Yes.—302. Generally so; the single lights might be an exception.—303. I do.—304. Yes.—306. All sufficiently brilliant, except the Ores light, east of Isle of Wight.—307. Yes.—308. I have always found them distinct.—309. I think they are not so strong as they ought to be.—310. If floating lights could be made more brilliant, they would be more readily distinguished from ships' lights.—311. Yes.—312. Yes.—313. Yes.—314. This depends on weather and circumstances, as the rolling or pitching of the ship or the changing position of the ship by wind or tides will give a different appearance to the lights.—315. Yes.—316. Generally they are, but the Seven Stones and Saltees are exceptions.—317. I do.—318. I think they are generally.—319. Yes.—320. I do.—321. Yes.—322. I think the floating lights in the United Kingdom cannot be better arranged.—323. Yes.—324. With above exception of Arklow Float.—325. Yes.—326. Yes.—327. Yes.—328. Yes.—329. In my opinion they are.—331. Yes.—332. Dungeness is not so brilliant as it ought, being in a narrow channel where so many ships and fishermen are always passing with bright lights, and have often taken the one for the other.—334. Yes.—335. They appear to be sufficiently brilliant, but mistakes do often occur in taking one for the other.—336. Yes.—338. They are.—339. I think at times lights floating will be mistaken.—340. I think they are sufficiently brilliant to be distinguished from shore lights or ships'—341. Yes.—342. Yes. I think so.—343. Quite so.—344. Have sometimes found a difficulty.—346. Different in colour from ships.—347. Yes.—348. In general the floating lights are not sufficiently distinct in character to prevent them from being frequently mistaken for travelling vessels' lights or shore lights at night.—349. Yes.—350. I cannot think they can be mistaken.—351. I do, with ordinary attention and judgment.—352. Yes.—353. Yes.—354. No.—355. Yes.—356. Yes.—357. Yes.—358. I think all floating lights that only show one bright light should have something to distinguish them from sailing vessels.—360. Those that have come under my observation are certainly so.—361. The floating lights are all good on the coasts of the United Kingdom, with this exception, they should be more explained both to situations and the time when lighted, as in the month of November last I nearly took the light upon the Blackwater Bank for the Tuskar had it not I, being well aware that I was further up Channel, and seeing the two lights instead of the one not changing colours. There cannot be mistaking any of them for a shore light.—363. Yes.—364. No.—365. I do.—366. Cannot say.—368. I do.—369. I think

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quite sufficient.—370. I think so.—371. I do.—372. Yes.—374. No, as far as my experience goes.—375. Not remarkable enough, more brilliant, and would suggest two lights in every lightship.—376. Yes.—377. Cannot.—378. Yes.—379. Yes.—380. Yes.—381. Yes.—382. Yes.—383. Yes.—385. Yes, in clear weather, but not so readily in hazy weather.—386. Yes.—387. Yes.—388. Yes; the sole exception is the Lemon and Over.—389. They would be better if more brilliant and distinct; I have seen many sailing vessels' lights which were difficult to make out, whether sailing vessel or floating lights, until near approach.—390. Yes.—392. Yes, they are very good, unless under peculiar circumstances.—393. Yes.—394. Yes.—395. The Blackwater lightship and the Arklow Bank lightship are liable to be mistaken for each other in daytime, particularly in hazy weather, both being masted alike.—396. Quite so.—397. Yes, I do.—398. Yes.—399. Yes.—400. I do.

401. Yes, when well attended.—402. Yes.—403. No, not in moderately thick weather.—404. Yes.—405. Yes.—406. Yes.—407. Yes.—408. Could not distinguish the "Start" from ships' lights; weather hazy.—409. Yes.—410. Yes.—411. Yes, all that I am acquainted with, except Henebogs.—413. Yes, what I have seen.—414. I think they are not first class vessels.—415. I think so.—416. Yes.—417. I do.—418. Yes.—420. Yes.—423. At times I have been mistaken, but rectified the mistake in time.—424. Floating lights may easily be mistaken for shore lights sometimes.—427. I have sometimes been at a loss to determine in hazy weather whether Bardsey light was on land or a ship's light.—429. Yes.—431. They might be made more brilliant.—432. Yes.—433. Yes.—434. Yes.—436. I do.—437. Yes.—440. Yes.—441. Yes.—442. Yes.—443. Yes.—444. Yes.—445. Yes.—446. No.—447. Yes.—448. Yes.—449. Yes.—450. Not bright enough nor high enough.—451. Yes.—452. Yes.—453. Never.—454. Yes.—456. Yes.—457. Yes.—458. Think they are brilliant enough.—459. I think they are.—460. At times you cannot tell them from fishing crafts' lights.—461. Yes.—462. No.—463. Yes.—465. No.—466. Yes.—467. Yes.—468. Yes.—469. Yes.—470. No; Dudgeon is not.—471. Yes.—472. Yes.—473. Have found some difficulty in distinguishing float lights from fishermen and ships' lights, but mostly owing to the state of atmosphere.—474. I have always found them sufficiently distinguishable.—475. Generally, yes.—476. Yes.—477. Yes.—478. Yes.—479. Yes.—480. Yes.—481. I think they are quite sufficiently brilliant, not to be mistaken for shore lights.—482. I think that they could not be better arranged.—483. I conceive it impossible any of the floating lights of the United Kingdom could by any possibility be mistaken for a ship's light; of the other I am by no means so sure.—484. Not sufficiently brilliant to prevent them being mistaken.—485. Yes.—486. In my opinion the light on Blackwater Bank ought not revolve, as it might be mistaken for Tuskar.—487. In general I do.—488. They are not sufficiently brilliant.—489. I do consider some more uniform and distinct character required and necessary to all single float lights, to distinguish them from ships' lights.—490. Floating lights in the United Kingdom are sufficiently brilliant, and, with care, cannot be mistaken either for shore or ships' lights.—491. I think that floating lights may be known from ships' lights or shore lights.—492. Yes; I think the Saltees is the worst.—493. They might be brighter to advantage.—494. I think the floating lights are often mistaken for ships' lights.—495. I do think that the floating lights are sufficiently brilliant and distinct in character to prevent them from being mistaken for anything but what they are. Perhaps a little more elevation would be an improvement.—496. Have not sufficient knowledge on the points to express an opinion.—497. I do not.—498. There might be probably some improvement made in several of them, such as the Saltees, Arklow, and the Owers; when the weather is a little hazy they are not well discerned.—499. No; not in moderately hazy weather.—500. I think not, as the lights now adopted on board of ships are so far different from lights on land or floating lights.

501. I have never found any serious difficulty.—502. I think them quite distinct to be mistaken for any light on shore.—503. I never have had any difficulty in distinguishing the lights.—504. I do.—507. Yes.—509. Yes.—510. The floating lights ought to be made more brilliant, as they are sometimes mistaken for steamboats' lights.—511. Yes.—512. Yes, generally speaking they are; but I have had a difficulty in distinguishing the Gull light from Ramsgate, and the North Foreland coming from southward.—514. Yes.—515. Yes.—516. Yes.—517. Floating lights are good.—518. I do not see how they can be improved.—519. The only deficient light is the Dudgeon, which, if possible, should be improved.—521. I think at present they are.—522. I never mistook them.—524. Yes,

II.

I think they are well placed, and can hardly be improved upon; I speak, of course, of those parts I am in the habit of traversing.—525. Never mistook them in clear weather.—526. Yes.—527. Sufficiently brilliant, but not easily distinguished from ships.—528. Generally not power enough.—530. It is hard to distinguish floating lights in bad weather; if an improvement could be made, it would be necessary.—531. I think they are.—532. Cannot say.—534. Yes.—535. Ships' lights are very commonly too brilliant.—536. I do.—537. There are none in use upon the west coast.—539. As far as I recollect they are sufficient.—540. Increase of brilliancy very desirable to make them more distinct.—541. I fear the melancholy loss of the *Pomona* lately on the Blackwater Bank, was occasioned through inattention to the lead, and the master, in my opinion, taking the floating lights on the bank for Tuskar lights, and which floating lights on the bank I fear was not laid down on the chart on board of the Irish or St. George's Channel. All newly erected lights should be pointed out on the charts, and sufficient notice given hereafter by the shipping master, or others, previous to sailing.—542. I do.—543. I only know that at Liverpool, which is as easily distinguishable from the particular configuration of the three lights on it.—544. Yes.—545. I do.—546. Yes, in general.—548. No.—549. Yes.—550. Yes.—551. Where practicable, floating lights should revolve.—552. I have never been deceived by them.—553. Equally so.—554. No.—555. Yes.—556. A distinction is requisite between the Owers and St. Catharine light, both being fixed lights.—557. Yes.—558. Some are very difficult to make out, as the Owers and Nab.—559. Yes, under the present regulations of ships' lights.—560. Unable to give an opinion, having been many years absent from England.—561. There are not any floating lights on the west of Scotland.—562. Yes, all sufficiently brilliant, except Portland in hazy weather.—563. Yes.—564. The floating lights are very brilliant and good lights, but sometimes ships and fishermen carry such bright lights, that if the floating light is stationary, it is difficult for a time only to distinguish one from the other.—565. I think that floating lights ought to be made as powerful as possible, as many ships now carrying very large bright lights, might be very easily taken for one of the light ships when in the vicinity of one. I have known this to be the case off the Owers; if that light was improved it would be one of the greatest improvements in the Channel, and prevent many ships being lost in the night amongst these very dangerous rocks.—566. Yes, but I should suggest rockets at Dudgeon, at stated intervals of 15 minutes.—567. When there are a number of ships and fishing boats in the Swin, it is sometimes difficult to distinguish the middle light.—568. Yes.—569. Yes.—570. Yes.—571. I think unmistakable.—573. I consider them sufficiently brilliant.—574. Yes.—575. No.—577. Yes.—578. Double or treble lights, yes; single lights, no.—579. Yes.—580. Yes, but think the Nore and Mouse lights might be improved.—581. I think they are sufficiently brilliant and distinct.—582. They are, in my opinion, not sufficiently distinctive.—583. Yes.—584. Yes.—585.—Generally so.—587. Saltees lightship (two lights) off Waterford, Ireland, are not sufficiently brilliant; when the weather is hazy, you are close on board of them, before seeing them.—588. Coningbeg lightship, off the Saltees, (two lights) deficient in power, can only be seen a very short distance when the weather is at all hazy.—589. Yes.—590. No.—591. Yes.—593. The lights on floating vessels are not sufficiently brilliant for distinction from ship lights.—595. I do think the floating lights are sufficiently brilliant to prevent them from being mistaken for ships or lights.—596. I think they are.—597. I do.—598. Yes.—599. I never had any difficulty in distinguishing them.—600. Those I am acquainted with, which consist of all from North Foreland to Scilly, I am perfectly satisfied with.

601. Oft times it is very difficult for awhile to distinguish them from such lights as many of the steamers carry at the masthead, and such as many ships carry or used to carry at the bowsprit ere the coloured lights came in use.—602. I have been mistaken at first sight.—603. Not at all times.—604. I do think floating lights are sufficiently brilliant to prevent any mistake.—605. Yes.—606. Yes.—607. Yes.—608. Yes.—609. Yes.—610. Yes.—611. Yes.—612. Yes.—613. With common care I do not think it possible to mistake them from shore or ship lights.—614. Yes.—615. Yes.—616. They might be improved and made more distinct.—617. I think the lightships in Liverpool Bay sufficiently brilliant, and never mistook them for ships' lights or shore lights.—618. Yes.—619. Yes.—621. I consider that floating lightships are not sufficiently brilliant to distinguish them from shore lights, but more especially ship lights.—622. I do.—623. No.—624. I think the Seven Stones, off

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the Land's End, and the Saltees deficient in this respect.—625. Not sufficiently distinct in character.—627. I think they might and ought to be more brilliantly lighted.—628. I think they are sufficiently brilliant.—629. The Dudgeon and the Sunk.—630. The Dudgeon and the Sunk, with the late improvements in lighting, might be made better.—631. Yes.—632. So far as I have seen, yes.—633. I do think them sufficiently brilliant.—634. Yes.—6.5. Quite sufficiently distinct not to be mistaken for ships' lights.—636. I do.—637. Yes.—638. When stationary, I have frequently been unable to distinguish them from the lights of ships riding in their vicinity, which on board some are very good; and I regret that more uniformity in the quality of lanterns and lights carried by ships is not made imperative.—639. Yes, if there is an intelligent exercise of proper precautions.—640. No.—641. Yes.—642. I do not consider the white fixed floating lights sufficiently distinct from the present lights on board ships at anchor or the shore.—643. Yes.—644. Yes.—645. I have seen but few floating lights; those I have seen appear to me to be effective.—646. Yes.—647. Yes.—648. Yes.—649. Yes.—650. No.—651. I think that floating lights should be made more brilliant, and have greater space-penetrating power than any ordinary ship light whatever.—652. Not sufficiently familiar with them to give a competent opinion.—653. Yes.—654. I consider all the floating lights in the Channel are insufficient, and are often mistaken for ships' and shore lights. The Saltees light is a poor one and all the others up to the Kish Bank, and in my opinion should be further off shore.—656. Those with which I am acquainted, I think generally are.—657. I think the lights shown in the floating lightvessels are sufficiently brilliant and distinct in character to prevent their being mistaken for ships' lights or lights on shore.—658. Yes.—660. Yes.—665. Yes.—666. Yes.—667. Yes.—668. Yes.—669. Some vessels' lights are so good that it is not possible to distinguish them from the lightships. I have been unable to make out the Eddystone light from a number of vessels' lights around.—671. I think the lights in the United Kingdom sufficiently distinct to prevent their being mistaken for ships' lights or lights on shore.—672. Yes.—673. Yes.—674. Yes.—675. Yes.—676. I am of opinion they are sufficiently brilliant to prevent their being mistaken for ships' lights, although I have known instances where, when first seen by lookout men, they have been reported as ships' lights.—677. I think they are.—678. Scarcely so.—679. Yes.—680. Yes.—683. Those I have seen cannot, with common attention, be mistaken for shore or ship lights.—685. Yes.—687. Sufficiently brilliant, but the light at Dungeness difficult to distinguish at night when any other ships are rounding it.—688. Yes.—689. Yes.—690. Yes.—691. All the lightships I am acquainted with have two lights. I have never mistaken them for ships' or shore lights, though all fixed lights are liable to be mistaken.—692. I think they might be more brilliant and distinct by having them of greater height and of different colours.—693. This is a very difficult question to answer, as so much must depend upon the state of the weather.—694. Yes.—695. The soundings and bearing of the light would be sufficient to know it by.—696. Yes.—697. Yes.—698. Yes, in English Channel.—699. I do not think they are generally.—700. Those I have seen I should think could not be, with care, taken for ship or shore lights.—701. Hardly.—702. No.—703. I think they are sufficiently distinct.—704. I think they are often mistaken for ships' lights. The more brilliant they can be made the better, as long as, when there are two or three in one vessel, they can be prevented from producing such a glare as to appear as one light.—705. Yes.—706. Yes.—707. Yes.—708. Some deficient.—709. I do think them sufficiently brilliant not to mistake them.—711. Yes.—715. I think that they could not be taken for ships' or shore lights.—716. No.—717. Those I am acquainted with are sufficiently good.—718. I think they are in the above places.—719. Sufficiently.—720. Yes, in clear weather.—722. I consider that they are.—723. Those I am acquainted with are sufficiently good.—724. I do.—725. It is stated by some that Dunnet Head light is placed too high, vessels often mistaking it for a star; and a foreign vessel some years ago, so taking it, ran ashore in Munkle Bay.—726. They are frequently liable to be mistaken. A more distinct character of light would be a great improvement.—727. I think by proper attention floating lights may generally be distinguished from ships' lights.—728. Yes, as regards English ships' lights. Many of the American ships are in the habit of carrying lanterns at their jib boom ends in the channel.—729. Yes.—730. When at sea I did not think there was much fear of mistakes; but now, all vessels being com-

pelled to carry lights, some of the best kind, there might be mistakes by those who have not much experience in distinguishing the different descriptions of lights.—731. Yes.—732. Yes.—733. Generally.—737. Might be improved.—738. As some vessels exhibit very bright lights at anchor, I think the floating lights might be made more brilliant.—739. Generally, except the Mouse lightship.—740. I think they are.—741. Yes.—742. Yes, except a distinguishing light at the Mouse.—745. Yes.—746. Yes.—747. I do not think those that I am accustomed to see are, viz., the Owers and Nab.—748. The present system of ships' lights is rather calculated to deceive.—749. Yes.—750. No.—751. An alteration might be made in the arrangement of the lights in Dublin Bay to the advantage of navigators.—752. Yes.—753. If they are not sufficiently brilliant, they should be improved.—754. So far as I am acquainted, I think they are all that can be desired.—755. Yes.—756. Yes.—758. Yes.—759. Yes, as far as my experience goes.—760. I do not think them sufficiently distinct in character from ship or shore lights.—762. Not competent to judge.—763. Yes.—764. Yes.—765. May be improved.—766. Yes.—770. Yes.—771. I consider they are sufficiently brilliant to prevent their being mistaken for ships' lights or lights on shore.—772. I think the floating lights all sufficiently good, and powerful enough.—773. Yes, and ought not to be mistaken.—774. I think so, in general.—776. Yes.—777. I think they are.—778. Sufficiently brilliant and distinct.—779. No.—781. Yes.—782. Yes.—784. Yes.—785. What I have seen I think they are.—789. Not sufficiently brilliant to prevent them from being mistaken for other lights.—791. Quite so.—792. Yes.—793. Yes.

10. Do you think that the Fog Signals now used in Lighthouses and Floating Lights in the United Kingdom are efficient?

1. Yes.—2. Yes.—3. Those that I am acquainted with are quite efficient.—4. I do.—5. Yes.—6. Yes.—7. Yes.—8. Am not acquainted, to any extent, with the methods in use.—10. Yes.—13. Have no information.—14. Perfectly so.—15. Yes.—16. I think so.—17. Yes.—18. I suppose so.—19. Yes.—20. Yes.—21. Yes.—22. No, there ought to be a large bell to distinguish it from other lights on St. Anne's.—23. Yes.—24. Yes.—25. Yes.—26. I think they are quite sufficient.—27. Yes.—28. Yes.—29. Yes.—30. Yes.—31. Yes.—32. Yes.—33. They cannot be heard far enough.—34. The fog signals are inefficient. The gongs cannot be heard but in calm weather, and on board of steamers not at all. I would suggest the firing a gun, at a given time, at the Needles and Bembridge, which would enable the packet steamers to approach, and make their passage.—35. Yes.—36. I have passed light vessels very near, and have not heard the signal until after having passed the lightship. I am not aware of any fog signals being at Dungeness or the South Foreland.—37. Yes.—38. Yes.—39. I think gongs preferable to bells.—40. There cannot be anything more required than the present fog signals that are used in lighthouses and floating lights.—42. Yes.—43. Superior gongs best signal.—44. Yes.—45. Yes.—46. Yes.—47. Yes.—48. Yes.—49. Yes.—50. Yes.—51. Yes.—52. Yes.—53. Yes.—54. No; a gun fired at short intervals would be a better signal on board floating lightships.—55. Yes.—56. Yes.—57. Yes.—58. Yes.—59. Yes.—60. Yes.—61. I do not. It is highly important that these be very efficient, and most regularly attended to.—62. Yes.—63. Yes.—64. I am of opinion that fog signals on board lightships ought to be sounded by machinery, so as to ensure a regular interval between the sounds. The method now in use is uncertain, and quite depends on the watch on deck; and I have known them to be neglected for a long time, and only sounded when a vessel is seen approaching through the fog.—65. Yes.—66. There cannot be anything more required than the present signals that are used.—67. I do.—68. Yes.—69. Yes.—70. There cannot be anything more required than the present signals that are used.—71. Yes.—72. Yes, if well attended to.—73. Perfectly, those that I am acquainted with.—74. I have no experience of them to say.—75. I never heard any.—76. They admit of improvements. The lights also of small vessels generally not bright enough.—77. Yes.—78. I am of opinion that the gongs now used on board floating lightvessels cannot be heard at a sufficient distance.—79. Yes.—80. I think the floating-light

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signals efficient, but respecting the lighthouses have no knowledge.—81. I do.—82. Yes.—83. Yes.—84. I am not used to them.—85. I do.—86. I am not used to them.—87. Yes.—88. I have seldom heard them at any of the stations.—90. Yes.—92. Yes.—93. I do.—94. I think them efficient.—95. Yes.—96. Yes.—97. Yes.—98. Yes.—99. Yes.—100. No.

102. Yes.—103. Yes.—104. No.; a gun on Flamborough Head, Outer Fern, and Buchan Ness, I think are wanted. 105. Guns should be fixed to answer guns from vessels both at Kirk lightships and Kingstown pierhead.—106. Yes.—107. Yes.—108. Yes.; they cannot be better.—109. Yes, in lightships.—110. Cannot say.—111. Those I am acquainted with I think are efficient.—112. Yes.—113. Yes, I think they are.—114. Yes, quite so at the time I was conversant with them.—115. I scarcely can say.—116. Do not think that bells and gongs are sufficient. Guns fired every fifteen minutes, or at longer periods, would help a great deal.—117. Yes.—118. Yes.—119. Cannot say.—120. If a gong were substituted at the breakwater light, instead of a bell, it would be preferable.—121. I should consider a powerful whistle, wrought by an air cylinder, as an accompaniment to lighthouses or floating lights, an improvement. Such could be easily adopted, and would be heard at a great distance.—122. I think they are.—123. I think if a gong were substituted at the breakwater light instead of a bell, it would be preferable.—124. Yes.—125. None in the district.—126. Yes.—127. Yes.—128. Yes.—129. Yes.—130. Yes.—131. The signals are rarely heard in foggy weather, as far as my own knowledge goes.—132. Cannot give an opinion.—134. Yes, I do.—135. Yes.—136. Yes.—137. I do not; they cannot be heard at a sufficient distance, except in calm weather.—138. Yes.—139. From what I know of them I believe they are.—140. Yes.—141. I think so.—142. Yes.—143. Yes.—144. Cannot say.—145. I have neither seen nor heard one of them.—147. Yes.—148. I have never had an opportunity of judging.—149. Not acquainted with signals.—150. I do not think them efficient.—153. They are, I believe.—156. Yes.—157. Yes.—158. No.—159. Cannot say, not having experienced such.—160.—Yes.—161. Not having ever heard, cannot form an opinion.—162. Have never heard a fog signal.—163. Yes.—165. I cannot say I have ever been in a position to hear the fog signals.—166. If properly attended to.—167. They are of great use, but I consider a gun or bell better.—170. Yes.—172. Yes.—173. I do.—174. Never heard any.—175. I cannot say.—177. Yes.—180. I have never heard a fog signal on the English coast, and yet they may be very efficient.—181. No; they should all be gongs, striking all the time.—183. No.—184. No; they ought to be a gun fired from the floating lightship every half hour in thick weather.—185. They are.—186. Not in some cases.—189. Yes.—191. Yes.—193. Yes.—194. No improvement to suggest.—195. I cannot speak from experience.—198. Yes.—199. Those that I know are pretty good.

201. Yes.—202. I have never been sufficiently near in thick weather to test them.—203.—Yes.—204. Yes.—205. Yes.—206. Yes.—207. I do.—208. Yes.—209. Cannot say.—211. Yes.—212. I do.—213. I do not think them either sufficient or efficient. They cannot be heard distinctly at a reasonable distance to avoid danger.—215. Yes.—216. Yes.—217. Yes.—218. Yes, I think they are efficient.—220. Had no experience.—221. Never heard or seen any.—222. I have been 24 years in the coasting trade, and have never distinguished one from a lighthouse during that time, though riding within a mile of Humstanton by the day together.—224. Yes.—226. No.—227. Yes, but the steam whistle is far superior.—228. Yes.—229. Yes; but I consider, nevertheless, that a bell would be better in all instances than a gong.—230. I never saw or heard any fog signals, though I have been very close to the Start and Portland in fogs.—231. Yes.—232. No opinion.—233. Cannot say.—234. Quite efficient, in my opinion, for the purposes required.—235. I think if a gun were fired at intervals, it would make them more so; say, 30 minutes.—236. When used according to instructions.—237. Could you fire a gun every half-hour?—241. Give little attention.—242. Cannot give an opinion.—244. Do not know of any, only the gong in thick weather.—246. Yes.—247. Yes.—248. I think the fog signals are efficient.—249. Yes.—250. I think not. The report of cannon once every five minutes would be advisable in gales of wind; bell or a gong in moderate weather may do.—252. Yes.—253. I cannot answer this question. I have not been near either in foggy weather to prove efficiency.—254. I have never heard or known of any fog signals being used in any of the lighthouses on the east coast of Scotland.—255. A large gun much better.—256. Yes, if properly attended to.—

257. No.—258. I do not. A gun discharged every 5, 10, or 15 minutes would be much more serviceable to steamers; as, when the engines are slowed, the noise of steam quite drowns the bell or gong on shore.—259. They would be much better if they could be heard further off.—260. A gun fired every half-hour will be essential.—261. Quite efficient.—262. Cannot answer this question.—263. Yes.—264. Yes.—266. Yes.—268. Yes.—269. Yes.—270. I do.—272. Yes.—274. Never had an opportunity of testing the efficiency of any fog signals.—275. Yes.—276. Yes.—277. I never had experience of fog signals now used.—278. No; some are very bad gongs in use, or not properly struck.—280. I do.—281. Yes.—282. The fog bells are not always sufficient.—283. I think guns are the only efficient fog signals in blowing weather.—284. Yes.—285. Yes.—286. I do think they are efficient.—287. I think a gong is the best fog signal.—288. I do.—291. I think them quite efficient.—292. I think a gun fired occasionally would answer better.—293. They are of great use.—295. No; both a gun and gong should be at every lighthouse or lightvessel.—296. Yes.—297. Yes.—299. Quite efficient; as I have, in a dense fog, obtained correct bearings of a lightvessel by the sound of the gong.—300. Yes.

301. Yes.—302. In very foggy weather a maroon or explosive signal, like a gun, would be useful.—303. I do.—304. Yes.—305.—Quite sufficient.—306. Yes.—307. Yes.—308. I never had an opportunity to know.—309. Yes.—310. I have never experienced inconvenience from the present arrangement.—311. Yes.—312. Yes.—313. Yes.—315. I do.—316. I never heard one to give an opinion.—317. I do.—318. I think they are efficient; but feel that the gun signal, as used in parts of the United States, would be of great service.—319. Yes.—320. Yes; but an improvement may be made at the Baskets by a gun every quarter of an hour.—321. Cannot say, having left sea in 1853.—322. The fog signals cannot be better arranged, in my opinion.—323. Not known.—325. I never heard one at sea, never being near a station during a fog.—326. Yes.—327. There should be a report of a cannon sometimes, more especially in shallow water-points and low lands.—328. Yes.—329. I think they are.—330. No.—332. In floating lights.—333. Yes, perfectly.—334. Yes.—335. Yes; if kept in use in foggy weather.—336. Yes.—337. Yes, but often neglected.—340. I think they are.—341. Yes.—342. Yes, I do.—344. Never heard a fog signal.—346. Never heard any.—347. Yes.—349. Yes.—350. I cannot say.—351. I cannot speak from experience on this head but I would recommend the "trumpet musket" to be used on board lightvessels in addition to the fog horn and gong.—352. No.—353. I do.—354. Yes.—355. Yes.—356. Yes.—357. Yes.—358. I think the gong generally used on board lightships not loud enough.—359. Yes.—360. I do not know.—361. Efficient.—363. Yes.—364. No.—365. Yes.—366. I am unable to answer.—368. I do.—369. I think quite sufficient.—370. They are very fair.—371. I do.—372. Yes.—374. There is a great want of good fog signals for lighthouses. On the south-pier lighthouse here I used a gong for a short time; but, from the difficulty in procuring one sufficiently loud, I have again been obliged to have recourse to the bell, which is objectionable from being used for so many other purposes.—375. No use in strong winds; very well in calm winds.—376. Yes.—377. I should say not.—378. A gun on Lundy would be an improvement in fogs.—379. Yes.—380. Yes.—381. I cannot say.—382. Yes.—383. I never heard any fog signals from either lighthouse or floating lights.—385. No.—386. Yes.—387. Yes. I think the fog signals should be used more frequently; every one or two minutes.—388. No; the gong can only be heard in very still weather.—390. A shrill whistling sound would be heard further.—391. I do. I recommend a gun to be fired from Carlingford House, as the mountains obscure the light in hazy weather.—392. I do think they may be improved, but will not venture to suggest the better method.—393. No.—394. I never heard one.—395. I think not.—396. Yes.—397. Yes.—398. Yes, where the bells are good.—399. Yes.—400. I do.

401. No, by no means. More powerful and frequent sounds should be effected.—402. Yes.—403. No.—404. Yes.—405. Yes.—406. To the best of my judgment I think so.—407. No.—410. Yes.—411. No.—413. I do not know, having heard none.—414. Never required them.—415. I have seldom heard them, and think it would be better if the bells were struck at shorter intervals.—416. Do not know.—417. I do.—418. Yes.—420. Yes.—422.—No. A cannon would be much better, and could be heard a great deal further than a bell or gong.—423. They are little use, unless very near, when blowing hard, when the ship is to windward of the light.—421. I do.—427. The gun on the South Stack is the only one I

know of personally. That I think efficient.—428. Cannot say.—429. Never having heard them, cannot say.—431. Rockets displaying red lights at intervals would be an addition.—432. Yes.—433. Yes.—434. Yes.—436. Yes.—437. Never been near enough to prove.—438. Yes.—440. I have never heard any.—441. Never heard any.—442. As far as I am aware.—444. Yes.—445. I do not know.—446. Yes.—447. I never heard any of them.—448. Yes, only with reference to the Liverpool north-west lightship.—449. Yes.—450. No.—451. Yes.—452. If properly attended to.—454. No.—456. Yes.—457. Unknown.—458. Have not had any experience of them yet.—459. Very fair.—461. Yes.—462. Would suggest that brass guns of small calibre be fired at regular intervals.—463. Yes.—465. Yes.—466. Do not know.—467. Do not know.—468. Yes.—469. Yes.—470. I have never seen nor heard them.—471. Never heard them.—472. I prefer the gun.—474. I certainly do think so.—475. Yes.—476. Never heard or observed any.—477. Yes.—478. Yes.—479. Yes.—480. Yes.—481. I think they are quite efficient.—482. Quite so, as they are distinct from other fog signals.—483. I do.—484. No.—485. Bells are not sufficient; they ought to be guns with funnels fixed to them to extend the sound.—486. Never heard one.—487. I am not able to give an opinion, as I have never been close enough to any in thick weather to judge.—488. Never heard them.—489. Yes, when properly attended.—490. I think the fog signals are efficient, and I have always found them well attended to.—492. I think so.—493. Quite so.—494. I think a gun would be a very great advantage, if fired every half hour from both lighthouses and lightships in foggy weather.—495. No.—497. Could be better.—498. I have been several times close in to the shore in a fog, and never heard the signals. An improvement in that respect is requisite.—499. No.—500. I think the most requisite in thick weather would be firing cannon at intervals.

501. I believe a small snarut gun, to be fired at stated intervals in foggy weather, would be an improvement on the coast.—502. Yes.—503. I never have heard of any fog signals except the Liverpool lightships.—504. Yes.—505. No.—507. Yes, but would recommend a bell at Point of Ayr, also one at Innishowen lights.—508. A gun every 15 minutes would be better heard.—509. Yes.—510. Sufficient when followed up.—511. Yes.—512. Yes.—516. I have never heard any.—517. Many are not loud enough.—518. Gongs are good if used as they ought to be.—519. Not efficient, which I experienced no later than Monday last, when near the north end of the Goodwin.—520. I do; no fog signals in our Dundalk lighthouse.—521. If properly attended to, I think, quite sufficient.—522. Yes.—524. Yes.—525. Yes.—527. I do not.—528. If properly attended to, but in many cases not.—530. If they could be used oftener I would prefer minute guns.—531. I do.—532. Cannot say.—533. Yes.—534. Yes.—535. Quite efficient, if attended to, which is not always the case.—536. I think they are.—537. There are none in use upon the west coast.—539. Yes.—540. Cannot say.—541. I am of opinion the fog signals are very inefficient to warn vessels from approaching the shore, &c.—542. They are not efficient.—543. I know nothing of them.—544. Yes.—545. I do.—546. Yes. I would suggest a gun every 15 minutes in fog weather.—548. Yes.—549. Yes.—550. Yes.—551. The intervals are too long.—552. I would recommend them to be used on all lighthouses and vessels, and then let there be a little delay, by which it might be known what lighthouse or vessel it was.—553. Quite efficient.—554. No.—555. Yes.—556. Yes. I do.—557. I think that the fog signals are not used with sufficient frequency.—558. Yes, for the lead would always be a warning to a careful master.—559. Yes.—560. Unable to give an opinion, having been many years absent from England.—563. No.—565. I think the fog signals in the lightships are very good if properly made use of.—566. Yes.—567. Yes, when attended to.—568. Quite so.—569. Yes.—570. Yes.—571. I have found them to be so on several occasions.—572. No experience.—573. Yes.—574. Yes.—575. No. I consider that all lightships in thick weather ought to use guns in place of gongs or bells, as they could be heard when blowing hard.—576. Required a gun on all islands where a lighthouse is, and a good bell or a gong in floating lights.—577. Yes.—578. Yes.—579. Yes. I think no fog signal, if we may except the gun, not even the steamer's whistle can surpass the deep sonorous sound of the gong. (See *Appendix to Mariners' Evidence*, p. 579).—580. Lundy high is often obscured when the low light is visible in hazy or foggy weather, and I would suggest that the low light should be visible in a southerly direction equal to that of a northerly one.—581. I consider they are very efficient.—583. Seldom heard any; the present bell at Victoria or Queen's Channel useless.—584. No experience.—

589. No.—590. No.—591. Yes.—593. No. Fog signals are not used at all lighthouses, for, at Kinnaird Head (here), the lighthouse is not provided with any horn, bell, or rockets, &c.—595. I do think the fog signals now used are quite efficient.—596. I never heard or saw any fog signals at any of the lighthouses.—597. Never being high them, cannot say.—598. Yes.—599. I never heard one of them.

601. Never heard a fog signal used, except from the lightships at Liverpool; they appear good.—602. Yes, but think the gongs ought to be sounded at intervals by time, and a certain number. Each lighthouse or vessel to be numbered in each channel; the gong to sound the number.—603. Yes.—604. I do.—605. Have had no experience of them.—606. As far as I can tell.—607. May be improved.—608. Yes.—609. Doubtful.—610. Yes.—611. Yes, but may be made more so.—612. Yes, but may be improved.—613. I do.—614. They might be more efficient.—615. No, as regards the North-west lightship, where a gong and bell alone are used. Guns would be preferable. A blue light and rocket would be better during darkness.—616. No.—617. They are, in Liverpool Bay, if paid attention to.—618. No.—619. No experience.—621. Efficient.—622. Certainly not. Firing a gun, at a given time, would be preferable to the present system.—623. No. They should be more frequent.—625. Very inefficient.—627. They might be made more so.—628. I think they are efficient.—629. I think they are the best.—630. I think there are none better.—631. Yes.—632. Yes, when well attended to.—633. I do.—634. Not aware.—635. Never experienced them.—636. I do (bells might be increased in size, to give loudness of sound). I approve of Chinese gongs, from their peculiar and powerful sound, for lightships.—637. Yes; but at the same time I should strongly recommend a gun at the Needles Rocks, or a large bell.—638. I think them not sufficiently loud.—639. I do not know anything about them.—640. No.—641. No experience.—642. Do not consider they are heard at a sufficient distance.—643. Yes, and more would cause confusion, and do more harm than good.—644. Yes.—645. I think simple machinery might be used to keep up a continuous humming noise; for example, say the three lights on the Goodwin; viz., South Foreland, Gull, and North Sand Head.—646. So far as I know or have experienced, yes.—647. Yes.—648. Yes.—649. No; especially for steamers, as bells are difficult to hear when engines are working.—650. No.—651. I would prefer gongs (sonorous) to bells in lightvessels and lighthouses, if it were for no other reason than mere distinction.—652. Not sufficiently experienced to give an answer.—653. Yes.—654. I do not.—656. Had no experience.—657. Efficient.—658. Yes.—660. No.—666. I am unacquainted with them.—667. Yes, but very little experience.—668. No. It has struck me that a small gun fired occasionally, from vessels in such positions as the Seven Stones, Nab, Owers, South and North Goodwin, &c.—671. I think some improvement might be made in floating lightvessels, something more noisy and distinct being substituted for gongs; something on the plan of a whistle of a steam engine.—672. No.—673. No.—674. Yes.—675. Yes.—676. I cannot speak from experience, as I have not been in the vicinity of light vessels or houses during a fog.—678. I do.—679. Yes.—680. No experience.—683. Yes.—685. Yes, and could suggest no improvement.—686. I think so.—687. Efficient.—688. I have found no difficulty from them.—689. Yes.—690. Yes.—691. I have never heard a fog signal from either of them.—692. Not sufficiently acquainted with them to offer any information, but I consider a gong as most efficient.—693. I do not know.—694. Yes.—695. Never experienced the effect of any.—696. Have not experienced much fog in the Channel, to judge accurately.—697. Yes.—698. Cannot give an opinion.—699. I have not had an opportunity of judging.—700. Yes.

701. Yes.—702. Yes.—703. I cannot say.—704. I have not had much experience in the use of fog signals, but I would recommend uniformity, and that to be a gong worked by machinery, which I consider the best.—705. Yes.—706. Yes.—707. Yes.—708. No.—709. I think they are.—710. The signal fog gun at Holyhead is very badly placed at present, on the top of the mountain, which makes it all but useless for the packet service, for which it was put. It ought to be moved to the South Stack Island as the best place. If not there, to be placed low down on the low part of the North Stack.—711. The signal fog gun at Holyhead is very badly placed; at present it is on the top, or near the top, of the mountain, which makes it all but useless for the packet service, for which it was put there. It ought instantly to be placed on the low point at the North Stack. Even for general purposes it is useless where it is.—712. I strongly recommend that the gun on Holyhead mountain be removed

to the South Stack, for the safety of vessels in general as well as the packet service.—713. No. There should be a fog gun in the North-west lightship, Liverpool, at the South Stack, Holyhead, and Kish light, Dublin Bay.—714. Might be more efficient by a fog gun in North-west lightship, Liverpool, South Stack Rock, and Kish lightship.—715. I do not. I would recommend that all lightships at the entrance of a bay or channel where ships have to run for, should have a signal gun in addition to the gong and bell. I consider the signal gun at Holyhead very badly placed; it should be on the South Stack.—716. I do not. Gun I would recommend in the North-west lightship, Liverpool, and Kish, Dublin Bay.—717. The fog signals in the North-west lightship at Liverpool, and Kish lightship at Dublin Bay, and the Copelands Island, the entrance of Belfast Lough, are not efficient. I would strongly recommend two guns every half hour, which would be a very great service, in thick weather, for all vessels.—718. No. The North-west lightship, before named, requires a fog gun, also the Menai Straits lights.—719. Efficient.—720. Sometimes.—721. I think in many stations a gun, particularly on board the Kish lightship.—722. A gun be fired half-hourly on lightships and lighthouses at the entrance of ports where there is much traffic, as the report of a gun can be heard much further than the sound of a bell.—723. The fog signals in the North-west lightship at Liverpool and Kish lightship, Dublin, are not efficient. I strongly recommend fog guns every half-hour.—724. Not at Holyhead—very inefficient. I would recommend, either on the South Stack Rock, or on the low part of the North Stack, as soon as possible, the fog gun.—727. By proper attention to the signals now given, I think them sufficient.—728. In Bristol Channel, yes.—729. To the best of my belief they are.—730. I do not know what fog signals are used now, but when at sea thought they were not half the service they might have been.—731. Yes.—732. Yes.—733. Generally, when diligently attended.—737. No.—738. Yes.—739. No.—740. I think a gun fired occasionally at Flamborough Head would be of service.—741. If properly attended to.—742. I would prefer a gun fired every half hour at Flamborough Head and Newarp lightvessel.—745. Yes.—746. Yes.—747. I do not think they are.—748. I always endeavour to keep farther off lighthouses than to be able to answer this question.—749. Yes, as far as I can judge.—750. No.—751. Not by any means. Greater sound should be given in foggy weather. A gun fired at short intervals on board the Kish lightship would be of the greatest service.—752.—Yes.—753. Signal guns can alone be effectual.—754. Have never been sufficiently near to distinguish; always avoid floating lights as much as possible.—755. Yes.—756. Yes.—758. Yes.—I think them very defective.—760. I cannot say.—761. I think the time and tolling of bells might be improved. See reply to Query 27.—762. Not competent to judge.—763. Yes.—764. Yes.—765. May be improved.—766. I do not know, nor have I never heard of any fog signals.—770. I have never heard any.—771. I have never heard or seen any fog signals made use of in any lighthouses or lightships except at Sambre Light Head, Halifax, and that was firing guns.—772. I know nothing of them.—773. If clock machinery were applied to the gongs, bells, or rattles, it would be a safeguard against neglect.—774. I think they are not well attended to in lightvessels, and a gun fired occasionally at Flamborough Head.—775. They are not efficient; there is much need for improvement.—776. No.—777. I think they are very useful.—778. Yes.—782. An improvement in this respect is desirable; the fog bells are not heard at a sufficient distance.—783. Yes; but the bell is much better than the gong.—784. May be improved.—785. Have not had experience enough to tell.—786. It would be more efficient if they could be heard farther, for we are often very close before we are able to hear these signals.—789. No.—720. Crossby lightship, and Formby lightship, both strike nine strokes on the bell during foggy weather. Now I think if one or the other would strike only six strokes, and the other nine, it would give seamen an idea which of the two channels he was in, and I think the north-west lightship should fire a gun every half-hour in addition to the gong.—791. No.—792. No.—793. No.

11. Do you think that Fog Signals are used with sufficient frequency in Lighthouses and Floating Lights in the United Kingdom?

1. Yes.—2. The gongs on board lightships might be sounded a little oftener in foggy weather.—3. Yes, as far

as my experience goes.—4. I do.—5. Yes.—6. Yes.—7. Yes, because no great frequency is required during fogs, the weather being still, and the motion of vessels through the water being slow.—10. Yes.—13. I cannot say; but the necessary frequency depends on the facility or intricacy of the navigation, breadth of channel, and other local conditions. Cases of wreck have occurred for want of fog signals.—14. I never found otherwise.—15. Yes.—16. I think they cannot be too careful about fog signals on board floating lightships, as I drifted past the Southsands lightship in a dense fog, and never heard her fog signals. I passed her close to twice.—17. Yes.—18. I suppose so.—19. Yes.—20. Yes.—21. Yes.—22. Yes.—23. Yes.—24. Yes.—25. Yes.—26. I think that they are. I always hear them when passing.—27. Yes.—28. Yes.—29. Yes.—30. Yes.—31. I do.—32. Yes, provided proper attention be paid to the instructions given.—33. I do not.—34. The fog signals are used with sufficient frequency, but cannot be heard at a great distance if it is blowing.—35. Yes.—36. Where there is a great traffic of shipping there should be no cessation; for, in narrow channels, it would be advisable. There should be no limited time.—37. Yes.—38. Yes.—39. Yes.—40. The more frequently fog signals are used in lighthouses and floating lights, the better it is for shipping.—41. No.—42. Yes.—44. In my locality, yes.—45. Yes.—46. Yes.—47. I think they ought to be used more frequently.—48. I have always found them so when I needed them.—49. Yes.—50. Yes.—51. I believe so.—52. I have never felt any inconvenience therefrom.—53. Yes.—54. It would be better if they were used more frequently.—55. Yes.—56. Yes.—57. I have never felt any inconvenience therefrom.—58. Yes.—59. I have not observed any neglect.—60. Yes.—61. Not generally.—62. I never felt any inconvenience in that respect.—63. Yes.—64. I think that fog signals in lighthouses and lightships ought to be used at regular intervals; and in order to accomplish this, they ought to be struck by machinery.—65. I have never experienced any inconvenience through their infrequent usage.—66. The more frequently signals are used in lighthouses and lightships the better.—67. Yes.—68. Yes.—69. Yes.—70. The more frequently fog signals are used in lighthouses and lightships the better.—71. Yes.—72. I think they are.—73. Yes, very good.—74. Yes.—78. Yes.—79. Yes.—81. I do.—82. Yes.—84. Yes, if used according to regulations.—85. I do.—86. Yes, if used according to regulations.—87. Yes.—88. Every five minutes in fog.—89. Yes.—93. I think the fog signals in floating lights should be used every five minutes, especially when placed in a tide's way. They cannot be sounded too often.—94. I have ever found them used when required.—95. Yes.—96. Yes.—97. Yes.—99. Yes.—100. Yes.

102. Yes.—103. Yes.—104. No.—106. Yes.—107. Yes.—108. Yes, I believe they are.—110. Cannot say.—111. I think they are so, as far as I know them.—112. Yes.—113. Any I have heard are.—114. Fog signals ought to be kept up with continuance during fogs.—115. I cannot say.—118. Yes.—119. Cannot say.—120. I do.—121. I am not aware what means are adopted to ascertain how and where they are used. The use of them should be recorded in a daily log.—122. No.—123. I do.—124. Lightships' gongs ought to be sounded at least every five minutes.—127. Yes.—128. Yes.—129.—They might use them oftener with great benefit to shipping.—130. Yes, so far as I have the means of observing.—131. No.—133. No, not in floating lights.—134. Yes.—135. Yes.—136. Yes.—137. I do not. I think every two minutes would be too often.—138. Yes.—139. Well attended to.—140. Yes.—141. Yes.—142. Yes.—143. Yes.—144. Cannot say.—145. I cannot say that they are not.—147. Yes.—149. Not acquainted with signals or their use.—150. No, they are not used with sufficient frequency; but could an improvement in the sound be obtained, the present time would suffice.—153. Yes.—156. Yes.—157. Yes.—158. No.—160. Yes.—161. Cannot say.—162. Cannot tell.—163. Yes.—165. I can only answer as in the previous question, No. 10.—166. If rung according to instructions.—167. I consider in a fog they should be continually used.—168. I think not.—170. Yes.—172. Yes.—173. I have had no difficulty.—174. Never heard any.—175. I cannot say.—177. Yes.—180. To this question I am not prepared to answer.—181. Question answered in No. 10.—183. No.—185. I do not know.—186. No.—189. Yes.—191. Yes.—192. Yes.—193. Never high enough to hear those signals in a fog.—194. Whenever observed, very regular.—195. I have had no experience.—196. Yes.—198. Yes.—199. Those that I know are.

201. Yes.—202. I cannot say.—203. Yes.—204. Yes.—205. Yes.—206. Yes.—207. I do.—208. Yes.—209. Cannot say.—211. Yes.—212. Should, in all cases, be used

every five minutes.—213. I do not; with a fast steamer, in foggy or hazy weather, they are at present nearly useless.—214. Yes.—215. Yes.—217. I never had any fault to find.—218. Yes. I do.—219. I have never seen or heard any fog signals in lighthouses used, but I have heard the gong from lightvessels.—220. Have had no experience.—221. Never heard any.—222. Lighthouses, no; floating lights, yes.—224. Yes.—225. Yes.—227. In the floating lights they are well attended; in the lighthouses I have had no opportunity of ascertaining.—228. I should think not, having been many years at sea as master, and have seldom heard fog signals.—229. Yes.—230. No.—231. Yes. 233. Cannot say.—234. I am of opinion they are, to the best of my knowledge.—235. When attended to, they are.—237. There ought not to be pauses of more than five minutes. In my steamer the bell never ceases.—242. Cannot say.—244. Not frequently enough.—247. Cannot say.—248. I think the fog signals are used with sufficient frequency.—249. Yes.—250. I never found them to be so sufficiently frequent; as they ought to be.—251. Not sufficiently acquainted to express an opinion.—252. Yes, except in narrow channels.—253. I cannot reply to this question from experience.—255. At Holyhead the gun is most valuable.—256. No.—257. No.—258. I do not.—259. I do not think they are; floating lights in particular.—261. Quite sufficient.—262. Cannot answer this question.—263. Yes.—264. Yes.—265. I can say as much of the breakwater fog signal.—266. Yes.—268. A fog bell on the Macaulie buoy is required.—269. Yes.—270. No.—272. Yes.—275. No.—276. Yes.—277. I cannot say, as I had no experience of them.—278. Yes.—279. Yes.—280. I do.—281. Yes.—282. As far as my observation goes, yes.—283. I have never found any want of them.—284. Yes.—285. Yes.—286. I think they are attended to regularly.—287. I think they should be used more than they are.—288. I do.—284. Cannot be used too often.—291. I consider that those signals are well attended to.—292. I do.—293. I think they are.—294. Yes.—295. No.—296. I have not much experience.—297. Yes.—299. Yes, every ten minutes; but five minutes might suit better.—300. Yes. 301. Cannot say.—302. Yes.—303. I do.—304. No.—306. Yes.—307. Yes.—308. I never had an opportunity to know.—310. I think it may be advantageous to use them with greater frequency in narrow channels.—311. Yes.—312. Yes.—313. I cannot say.—315. To the best of my knowledge they are.—316. I decline giving an opinion, for the above reason in Article 10.—317. I do.—318. I do.—319. Yes.—320. Yes.—321. Cannot say.—322. I have always heard the fog signal at as great a distance as I could expect. I never had to complain.—323. Yes.—324. I cannot say.—326. I think the sounding of the gong ought to be continuous in foggy weather.—327. For strangers on the coast they should be used more frequently.—328. Yes.—329. I think they are, as far as they have come under my notice.—330. No.—332. Yes, in floating lights no reason to complain.—333. Not aware.—335. No.—336. No. I think they ought to be used more frequently.—340. I have no reason to believe they are not.—342. I cannot say.—346. Do not know, as I have never heard any.—347. They might be used more frequently with advantage.—348. Where the gongs are struck at intervals of from ten to fifteen seconds, and a gun fired every fifteen minutes.—349. I have not observed that fog signals on lighthouses are very much attended to.—350. I cannot say.—351. I cannot say.—352. No.—354. Yes.—355. Yes.—356. Yes.—357. Yes.—358. I do not think even the present gong used often enough.—360. Cannot tell.—361. The fog signals, as far as I have known, are used with sufficient frequency.—363. I do not think they are.—364. Yes.—365. At present I think they are well attended to.—366. Cannot tell.—368. I do. 369. I do.—370. I think so.—371. I do.—372. Yes.—374. I think the more frequent use of fog signals at lighthouses would be most beneficial.—375. Yes.—376. Yes.—377. No.—378. Yes.—381. Cannot say.—383. No.—385. No.—386. Yes.—387. No.—388. I am not able to reply to this question.—390. Yes.—391. I do.—392. Yes.—393. No.—395. Yes.—396. Yes.—397. Yes.—398. Yes. I have found it so.—399. Yes.—400. I do.

401. No; they should be used constantly (not merely at intervals) during thick fog.—402. Yes.—403. Yes.—404. Yes.—405. Yes.—406. I cannot say.—407. Cannot say.—410. Yes.—411. No.—413. Have no idea.—414. Never had much occasion for their use. Would prefer a minute gun.—416. Do not know.—417. I do.—420. Yes.—423. I have never heard a fog signal during all the time of navigating, either in channel or colonies.—424. I think guns should be fired in foggy weather from lightvessels by day and night, and at short intervals.—

427. I have but once been near enough in a fog to hear the gun on the South Stack.—428. Cannot say.—429. Cannot say.—431. Can offer no opinion.—432. Yes.—433. Yes.—434. Yes, to the best of my knowledge.—436. Yes.—437. Do not know.—438. Yes.—440. I cannot say.—441. Never heard or saw any.—442. As far as I have had occasion to require.—443. Cannot be used too often.—444. Yes.—445. I have not experienced.—447. Never having heard, cannot form an opinion.—448. Yes, generally, from my experience.—449. Yes.—450. Yes.—451. Yes.—452. In thick fog I do not.—453. Yes.—454. Cannot say.—456. Yes.—457. Yes.—458. Do not know.—459. I should think so.—460. They might be used oftener.—461. Yes, to the best of my knowledge.—462. Yes.—463. Yes.—465. Yes.—466. Cannot say.—467. Cannot say.—468. Yes.—469. Yes.—470. I have never seen or heard them.—472. Yes.—474. I always found them attended to.—475. Yes, but have had but small experience of them.—477. Yes.—478. No.—481. I have never known them otherwise.—482. Yes, if not neglected.—483. I have never passed sufficiently near to give an opinion.—484. No.—485. They ought to fire oftener; say, 10 minutes, others 15 and 20 minutes. Half an hour is too long for a vessel going fast through the water.—486. Never heard one, but have often been up and down in fogs.—488. They are not used with sufficient frequency.—489. Not at all times in floating lights.—490. I do.—491. They are, for what I know.—492. I never have been near enough to hear them; if attended according to the direction, it is quite frequent enough.—493. I have never been close enough to distinguish them particularly, as I always trust to my lead.—494. I have often passed both lighthouses and lightships without hearing the fog signal, even in foggy weather.—495. I have never heard a fog signal from any lighthouse and lightvessel since I have been going to sea.—497. Yes.—498. I think not, as I have stated at No. 10.—499. Yes.—500. I have found it so, from a long experience in the Newfoundland trade. These signals have conducted me into the harbour; otherwise I might have been days upon the coast or met with some very serious accident.

501. I believe there should be some general rule for that purpose, and strictly enforced.—502. If used more frequently, I think it would be better.—504. I think they are.—505. Nil.—507. No; as great difference of opinion appears to exist amongst light-keepers as to the density of fog. I would also recommend that the bell at the Copeland light should be removed on to the Mew Island, and that if a bell were placed at the Point of Ayr, it should be at the extremity Point, not at the lighthouse, which stands a quarter of a mile from the shore.—509. Yes.—510. Answered in No. 10.—511. No.—512. Yes.—515. Wanted more frequently on the Copelands, entrance of Belfast Lough.—516. No.—517. No.—518. No.—519. I fear in lightvessels the gong or signal is oft neglected.—521. I have to complain of the non-attention of the captain and crew of the St. Nicholas Gat lightship, called Hewitt's Channel on the east coast, for not sounding the gong in foggy weather, ship being close to him.—522. Yes.—524. I think they are, but they can scarcely be too frequently used in dense fogs.—525. Yes.—526. Not in every case.—527. I cannot say.—528. Not.—530. Fog signals cannot be too quick in any case.—531. Yes.—532. Cannot say.—534. Nil.—535. No.—536. Not prepared to answer.—537. At present there are none on my route. I would suggest Sanda Light and Mull of Cantyre for fog signals, a locality of the coast where more shipwrecks take place in foggy weather than any other portion of the west coast.—539. I do.—540. Rather doubtful.—541. I do not, from all I have heard on the subject. More distinct signals might be practised, such as firing a gun every half hour during the fog, if applicable.—542. I am not aware of any neglect.—543. My experience of this matter having reference to a time and state of matters long past, any replies I could give you would have no value.—544. Yes.—546. I would suggest that a gun fired from such places as Orfordness, Cromer, Flamborough Head, and other headlands along the coast, and the bell or gongs continually a-going on board the lightships.—548. Yes.—549. Yes.—550. Yes.—551. No.—552. They may be used when necessary, but, as I have stated against No. 10, I think if that could be carried into effect it would be desirable and valuable.—553. I have always found them so.—554. Yes.—555. Yes.—556. Yes.—557. See No. 10.—558. Yes.—559. Not so frequent as might be with attention.—560. Unable to give an opinion, having been many years absent from England.—561. I have never heard warning signals from lighthouses during fogs on the west coast of Scotland.—563. No.—564. I cannot answer this question.—565. I hope they are, or

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ought to be.—567. At times.—568. Cannot answer from experience.—569. Yes.—570. Cannot answer this question.—571. The constant sounding of a gong in lightvessels would be preferable, but even as it is I consider it frequent enough.—572. Most of my time has been served in Shetland, where there was then one lighthouse, and the Orkneys, where there were three. I do not remember to have ever heard a fog signal from either of them.—573. Yes; I have heard the bell on the South Stack, Holyhead, quite distinct when the land could not be seen for fog.—574. No; for a ship would run a great distance during the interval.—575. Yes.—577. I have not noticed them.—578. I should suggest once in five minutes.—579. I have heard them frequently from lightvessels (floating lights); but do not recollect, with one exception, of hearing them from lighthouses.—580. No.—581. I think so.—583. No.—589. No.—590. Yes.—591. Yes.—593. I have no doubt but they would be attended to, if provided to lighthouses and floating lights.—595. I do think the fog signals are used with sufficient frequency in lighthouses and floating lights.—596. Cannot say.—597. Cannot say.—598. Yes.—599. From personal experience cannot say.

601. Cannot say. I know I passed very close to one lightship coming up the Channel in 1856. His bell was not going, and I hailed him about it.—602. No; they ought to be used oftener. Steam vessels in fogs and thick weather making hold of their course, and the noise of the wheels &c. I think oftener would be better.—603. No.—604. I do think so.—605. Have had no experience of them.—606. Yes.—607. Yes.—608. Yes.—609. Yes.—610. Yes.—611. No.—612. Yes.—613. Yes.—614. No.—615. No.—616. No.—618. No.—621. Certainly not. I should recommend that a register be kept of the state of the weather, and the number of days and nights signals were kept going.—622. In many instances I have noticed bells slowly rung, unless the paddles of a steamer or the noise of a sailing ship is heard.—623. No.—625. When efficient cannot be used too frequently during fog.—627. Neither loud enough, nor frequent enough, nor of a sufficiently distinct and uniform character.—628. I think they are.—629. I do.—630. I never heard of any, except the lightvessel of the Chapman, in the Thames.—631. I should think they were.—633. I do.—634. Cannot say.—636. It would be better in rivers, and the principal channels or thoroughfares to sound more frequent.—637. Yes.—638. I think that fog signals, however good, should be used at intervals not greater than ten minutes, to be of proper service to steamers.—639. See No. 10.—640. No.—642. Yes.—643. I cannot answer this question particularly, but generally they should be used frequently during fogs.—644. Yes.—645. A continuous humming sound instead of fog horns would be preferable. The same may be said with respect to gongs.—646. So far as I am aware, yes.—647. They cannot be too well attended to.—648. I have not had sufficient experience.—649. No. I think the fog gun at Holyhead would be more useful if shifted to South Stack lighthouse.—650. No.—651. No; bells or gongs in lighthouses and lightvessels instead of being rung in funeral or divine service order should be struck in pretty rapid succession, giving unmistakable warning.—652. Do not know.—653. To the best of my knowledge.—654. I do not.—656. Not sufficiently acquainted to give an opinion.—657. I have always found them sufficient, and have frequently experienced their benefit.—660. Cannot tell.—665. No.—666. From my experience of them I cannot say.—667. Yes, but little experience.—668. I do not know how often they are ordered to be used.—671. I think that fog signals are used with sufficient frequency in lightvessels, but as in floating lightvessels of the United Kingdom, I think some sharp shrill noise would be an improvement.—672. No.—673. No.—674. Yes.—675. Cannot say.—676. I cannot say, not having had experience.—678. Yes.—679. Yes.—680. No experience.—683. Yes.—685. Yes.—686. Yes.—687. Ought to be sounded every five minutes.—688. Yes, if the fog bell is continually rung.—689. Yes.—690. Yes.—691. I have never heard any.—692. Not sufficiently acquainted with them.—693. I cannot judge.—694. No experience.—695. Never approached near enough in a fog to ascertain.—696. No.—697. Cannot say.—698. Cannot give an opinion.—700. Yes.

701. As far as my experience goes, which is very small, yes.—702. Yes.—703. I am not aware.—704. I do not know.—705. Yes.—706. Yes.—707. Yes.—708. No.—709. I do.—711. My experience of 20 years in command of a mail packet in the Irish Channel teaches me that no floating lightship should be without a gun, and that gun fired every quarter of an hour during fog.—712. I would strongly recommend that a fog gun be placed on board

each lightship where vessels frequently pass, and fired every quarter of an hour.—713. Kish lightship off Dublin Bay, North-west lightship, and formerly lightship off Liverpool are not sufficient.—715. I think they are.—716. Yes.—718. Yes, as far as I am aware.—719. Quite sufficient.—720. Sometimes.—721. I have always found them sufficient when within hearing.—722. A gun, as before stated.—723. I think they are.—724. I would recommend the fog gun at Holyhead to be fired every quarter of an hour.—727. Where there is much traffic I should say there ought to be a constant signal in thick weather.—728. Yes, in Bristol Channel.—729. Yes.—730. I thought they were not used with sufficient frequency, or any regularity. The times should be stated, and varied as much as possible, for lights in the same vicinity.—732. Yes.—737. No.—738. No.—739. No.—740. I think they are.—741. I should propose a gun to be fired at Flamborough Head, Newark, and Kentish Knock in foggy weather.—742. No.—745. I think they are.—746. Yes.—747. No; as I have frequently passed the Nab, Warner, and Calshot Spit lights in a fog without hearing the guns.—748. Cannot say. See Answer 10.—749. I believe so.—750. No.—751. No; as I have stated, there should be greater sound given.—752. Yes.—753. Of very little use.—754. Not able to say, never having heard one.—755. Yes.—756. Yes.—758. Yes.—759. No; I have never received any aid from them but once, and that was from the Calshot lightship.—760. I cannot say.—761. Same as Answer 10.—762. Not competent to judge.—763. Yes, as far as I am acquainted with them.—764. Yes, as far as my experience goes.—765. Yes.—766. I do not know of any.—769. They are not. I have passed several in foggy weather when the bell ought to have been going and was not.—771. I think if fog signals were made use of more frequently there would not be so many ships wrecked.—772. I know nothing of them.—773. Not aware of any omission (see Answer No. 10).—774. I think so, if properly attended to with a gun, as in last answer, at Flamborough Head and Newarp lightvessel.—775. They are not; they should be almost continuous.—776. I have frequently had reason to complain of negligence in lightvessels in this respect.—777. Cannot say.—778. Yes.—779. Yes.—782. I am not aware of any neglect in the use of the bells.—783. Yes.—785. Could not say.—786. I think they should sound at least every five minutes.—789. All lightvessels and floating lights ought to have a gong, to be sounded, the former two strokes every 10 minutes, and the latter one every five minutes.—790. Yes, all I am acquainted with.—791. No.—792. No.—793. No.

12. Have you experienced inconvenience from a want of Tide Signals in Light-houses and Floating Lights—or from their inefficiency—or from a want of a uniform system?—if so, state where.

1. I have not.—2. No.—3. No; none whatever.—4. Never.—5. No.—6. No.—7. The system of showing tide-lights from a certain period of the flood to another of the ebb should be adopted as a universal system; but light-houses at the entrances of bar harbours might be made far more useful than they are at present, were the depth over the bar during tide time shown in figures visible from the offing, by a system of shifting boards.—8. No.—9. Yes; in all tidal harbours.—10. No.—13. In my report on Hartlepool to the Refuge Harbour Commissioners, I have noticed the defects in the tide signals, inasmuch as there no variation from half flood to half ebb, during which periods the signals are shown; consequently, they convey no certain information of the depth on the bar.—14. None.—15. No.—16. No.—17. No.—18. No; I could calculate for that.—20. None.—21. No.—22. No.—23. No.—24. No.—25. No.—26. I have experienced no inconvenience.—27. No.—28. No.—29. None.—30. None.—31. No, never.—32. No.—34. We do not require tide signals, having water at all tides.—36. A distinguished light would be very useful at Shellness Point in case of a gale of wind from the northward, when vessels part from their anchors in the Nab Channel.—37. No.—38. No.—39. No.—40. Tide signals are not required from floating lights to those that are acquainted. I never experienced any inconvenience for want of them.—41. No.—42. No.—44. No.—46. No.—47. No.—48. None.—49. No.—50. I have not.—51. None.—52. No.—53. No.—55. No.—57. None.—58. No.—59. No.—60. No.—61. I have not personally felt inconvenience from this, though I have heard others complain of it.—62. No.—

63. I have not.—64. I am of opinion that all tide signals ought to be uniform throughout the kingdom.—65. No.—66. Tide signals are not required from lighthouses to those that are acquainted.—67. No.—68. No.—69. No.—70. Tide signals are not required from lighthouses to those that are acquainted.—71. No.—72. None.—73. I know of none.—74. I have not.—75. No.—76. No.—78. No.—79. No.—81. No.—82. No.—84. I have not.—85. I have not.—86. I have not.—87. None.—88. Never.—90. None.—91. Not from lighthouses in particular, but have known injury to result from the want of tide signals under the control of proper authority; at Peterhead a uniform system is most desirable.—92. Not experienced inconvenience.—94. I have never experienced any.—96. No.—97. No. none whatever.—99. Girdle Ness.—100. No.

102. No.—103. No.—104. No.—106. No.—107. Not in my experience.—108. No.—110. Do not know of any inefficiency.—111. I have not.—113. No.—114. No.; none whatever.—115. Never.—116. At Liverpool the lighthouse cannot be seen in thick weather outside the banks from North Foreland; for overland route there is no night guide to London River.—118. No.—119. No.—120. Never.—121. No.; I think a uniform system might be adopted to be of great utility to ships navigating in Channel after a long voyage.—122.—No.; I never found any want.—123. Never.—124. No.—125. No.—126. No.—127. I have not.—128. No; never.—129. No.—130. No.—131. Can speak on this, but think that a uniform system would be best.—132. No.—134. No.—135. No.—136. Nil.—138. No.—139. Not any.—140. Nil.—141. No.—142. No.—143. No.—144. No.—145. I have not.—147. No.—148. I have never felt the want of tide signals in lighthouses or floating lights.—149. Never.—150. No farther than which will follow, will show an improvement.—156. No.—157. No.—158. No.—159. No.—160. I have not.—161. No.—162. No.—163. No.—165. I cannot say I have experienced any inconvenience from the want of tide signals.—167. Nil.—170. No.—172. None.—174. No.—175. I have not.—177. No.—180. To this question I must say, that I never have been placed in a position to require them.—181. No.—183. No.—185. Never.—184. No. I never have.—188. No.—191. No.—193. No.—195. No.—196. No.—198. No.—199. No.

201. No.—202. None.—203. No.—204. Yes, in the Tyne which is a bar harbour, and very defective, having no tide signals there from the first quarter flood until the first quarter ebb.—205. None.—206. No.—207. None.—248. None.—249. No.—252. Tide signals would be of much value at the entrance of the river Tyne.—243. I have not myself experienced any such inconvenience, but I would consider it very necessary that a uniform system should be adopted and strictly carried out in all lighthouses or floating lights.—214. Cannot say.—215. No.—216. No.—217. None.—218. I have not experienced any inconvenience nor want of tide signals.—220. No.—221. Never observed any.—222. No, not personally.—224. No.—225. No.—227. Never.—228. No.—229. No.—230. No.—231. No.—233. No.—234. Not any so far as my experience has gone, but I am of opinion that there is great need of some uniform system of tide signals required, principally for bar harbours.—235. No. I have not.—237. A mark to show seven feet of water in Whitby in the day would be of great service to me; they get money enough to do it.—242. No.—244. No.—246. No.—247. No.—248. I have not experienced inconvenience from a want of tide signals.—249. No.—250. No. I have not.—251. Never.—252. No.—253. No.—255. Not.—256. No.—257. No.—258. I have. There is no tide light or bell at the lighthouse, Belfast.—259. No.—261. Never.—262. I have not, having always been in the foreign trade.—263. None.—264. Never.—266. No.—269. None.—270. No.—272. No.—274. Never.—275. No.—276. No.—277. I have not.—278. No.—279. No.—280. I have not.—281. No.—282. No.—283. No. never.—284. No.—285. No.—286. I never experienced any inconvenience.—287. I have not had much experience in tide signals.—288. I have not.—289. No.—291. I do not think tide signals at all necessary in either lighthouses or floating lightships.—292. I have not.—293. No.—296. No.—297. No.—299. No.—300. No.

301. No.—302. No; an experienced pilot or master should always know the state of the tide.—303. I have not.—306. No.—307. None.—308. No. never.—309. Nowhere.—310. I have never experienced inconvenience from either of these causes.—311. No.—313. No.—315. None.—316. No.—318. I have not.—320. At Weymouth only.—321. No.—322. No.—323. No.—324. No.—325. No.—326. No.—328. No.—329. I have not.—332. No.—333. Never.—334. No.—335. No.—336. No.—337. No.—239. No.—340. I never have.—342. I have not.—343. No.—346. None.—347. No.—348. The absence of a uniform system is an inconvenience; the light on Rock Point at the entrance to Cork Harbour is

inefficient from the limited distance it can be seen in general.—349. No; I have had very little experience in that of going into tidal harbours.—350. I cannot say.—351. I cannot speak from experience.—352. No.—353. None.—354. No.—355. No.—356. No.—358. No inconvenience in England, but the Dutch coast often.—360. Never experienced such inconvenience.—361. None.—363. No.—365. I have not.—366. No.—368. I have not.—370. No.—371. I have not.—372. No.—374. From the want of proper tide signals at this port, I some years ago proposed the use of numerals moveable by the tide, and the Commissioners of this navigation in 1850 erected a house, where the depth of water on the bar has (during the day) been since exhibited from half flood to half ebb to vessels leaving the harbour, which system has worked with perfect regularity since its adoption. (I forward some printed particulars and a report from Mr. Stevenson, of Edinburgh, on the subject.) The use of flags and balls to indicate the depth of water is most inadequate; whatever system is recommended it ought to be general.—376. No.—377. No reply.—378. No. 381.—I have not.—383. No.—386. No.—387. Not in England, but in France.—388. The reply as before.—390. No.—391. Not any.—392. No.—393. None.—394. None.—395. No.—396. None whatever.—397. No.—398. No.—399. No.—400. Never.

401. No; tide signals are not desirable at lighthouses, or on board lightships (in my opinion).—402. No.—403. No.—404. No.—405. No.—406. No.—437. No.—409. No.—410. No.—411. No.—413. No.—414. Never have to use them.—416. No.—417. I have not.—418. Never found any want.—420. No.—424.—I have not.—427. No.—428. I have not.—429. No.—431. No.—432. No.—433. No.—434. No.—436. I have not.—437. No.—438. No.—440. No.—441. No.—442. No.—443. No.—444. No.—445. No.—447. No.—449. None.—450. No.—451. No.—452. No.—453. No.—454. No.—456. No.—457. No.—458. No.—461. Had no opportunity of judging.—462. No.—463. No.—465. No.—466. No.—467. No.—468. No.—469. No.—470. No.—471. Never seen any.—472. No.—474. I have not experienced any inconvenience in the ports I have frequented.—475. No.—476. No.—477. No.—478. No.—480. No.—481. I never have.—482. Myself. No.—483. I have not.—484. No.—485. No.—486. Never have.—487. No.—490. No.—491. None.—492. No.—493. I never have.—494. I have never known any inconvenience from any tidal light being out of place or out of order.—495. I have never experienced any inconvenience from any of the causes named.—496. No.—498. I have not.—499. No.

501. I have not; but I would suggest the principle of Liverpool Rock light as a uniform system.—503. I have found great inconvenience in entering Lough Foyle, as the lights are both the same height and colour.—504. No, never.—505. Nil.—507. No.—508. On Walney Island a more brilliant half-tide light; also a flag by day would be an advantage to the mariner.—509. No.—510. The tide lights (green) at Ramsgate Harbour are very faint, and cannot be seen at a distance.—511. No.—512. No.—515. No.—516. No.—517. No.—518. No.—519. None.—520. No tide signal in Dundalk pilot lighthouse.—521. None.—522. Folkstone Harbour light is not at times lit according to printed regulations.—524. Never.—525. No.—526. Bideford Bar has two lights, high and low, exhibited from half flood to half ebb. Would suggest that one light should be lit from sunset to sunrise, and the second be put in at half flood to half ebb; an positive that it would be the cause of saving valuable lives and property.—527. I have not.—528. A general uniform system required.—529. No.—530. No; there is no master but can make his calculation on the tides.—531. Not any.—532. No.—533. There is a larger buoy required on the Manacles.—534. Nil.—536. I have not.—537. There are none in use on my route.—539. I have not.—540. No.—541. On Haullblöven Light, entrance of Carlingford Lough, a large black ball is hoisted up 20 feet on a pole, from the summit, from half flood to half ebb.—542. I have frequently passed Tuskar and Holyhead without seeing any tide signals.—543. My experience of this matter having reference to a time and state of matters long past, any replies I could give would have no value.—544. No.—545. I have not.—548. No.—549. No.—550. No.—552. The Lizard lights are not very distinguishable when east or west of them, or thereabouts.—553. No.—554. No.—555. None.—556. No.—557. No.—558. I consider that a uniform system would be a great improvement; for instance, Dover, Rye, Shoreham, Littlehampton, are all different, and puzzling to a stranger.—559. No.—560. No.—562. No. 564. I do not remember any.—565. I have not.—566. I should suggest tide signals at Tyrer.—567. No.—568. Never.—569. No.—570. No.—571.—Never.—573. No.—575. No.—577. None.—578. No.—579. Yes; in No-

vember 1838 I drove ashore in Mount's Bay in a heavy gale from south by west. Had there been a directing signal, such an one as we have on the south pier at this port, and at Memel, I should have got into Penzance.—581. I think not.—583. If a lightvessel was placed where Bell Buoy now is, I think she should show the depth of water on bar of Queen's Channel for strangers' use in daytime.—584. No.—589. No.—591. I am very little acquainted with harbours where the tide signals are used.—593. I have no doubt that many harbours want tide signals, and where there are signals they should be better attended to, and a uniform system adopted.—595. I have not experienced any inconvenience from a want of signals in lighthouses and floating lights, or from their inefficiency or want of any uniform system.—596. Never.—597. Never.—598. No.—599. Have not.

601. No.—602. No.—603. No.—604. I have not.—605. No.—606. I have not experienced any.—607. No.—608. Yes, at the dock piers, but not in lighthouses or floating lights.—609. No.—610. No.—611. No.—612. No.—613. No.—614. No.—615. No.—616. No.—617. I have not.—618. No.—621. I am of opinion that an improvement might be made in tide signals.—622. Generally I think the coast of Great Britain as well buoyed as any other country.—625. No.—627. No; have had little experience of small tidal harbours.—628. None.—629. There is a great want of attention to the harbour lights in entering different harbours on the British coast.—630. I have in Shields harbour lights. They are lighted from half flood to the first quarter ebb, two bright lights; were one of these changed to a red light, say after high water, the low light to denote that the tide had come away strong; a fresh running with it is the occasion of a great many ships lost from want of sail.—631. No.—632. No.—633. Never.—634. No.—636. I have not.—637. Never, but at the same time it would be an advantage if all lighthouses were to show the state of the tide; viz., flood or ebb.—639. See No. 10.—640. No.—642. No; a uniform system much to be preferred.—643. No.—644. No.—645. No.—646. No.—647. No.—648. No.—649. No.—650. No.—651. I rather complain that a uniform system in these matters is wanting.—652. No.—653. No.—654. I have never seen them.—656. None.—657. Never.—658. No.—660. No.—666. Never.—667. No.—668. I have not, from the fact of my not having had to enter any harbours where tidal signals are used.—671. No.—672. Have not frequented tidal harbours.—673. Not frequented tidal harbours.—674. No.—675. No.—676. No.—678. No.—679. No.—680. No.—683. No.—685. No.—687. Never.—688. No.—689. No.—690. No.—691. No.—692. No.—693. No.—694. No.—695. No.—696. No.—697. No.—698. No.—700. No. I have not experienced any inconvenience.

701. No.—703. No. I have not.—704. No.—705. No.—706. No.—707. No.—708. Yes, at the entrance into the Tyne, with the wind from the northward, you cannot see the lights by night when lighted nor the flag by day when hoisted, as they cannot be seen until you have the harbour open, when there is a lee wind; and if a signal was made at Tynemouth light we then would know when to approach the harbour.—709. I never have.—711. I have frequently passed very close to the Kish, but from the noise of my own steam and the direction of the wind, have been prevented from hearing the bell or gong; had a gun been fired at stated intervals it would much facilitate reaching the harbour, and consequently the landing the mail.—715. I have not.—716. I have not.—717. No.—718. No.—719. None.—720. No.—721. No. never.—722. Not any.—723. No.—724. None.—725. Not being a sea-going person, I cannot answer this question satisfactorily.—726. Yes; a uniform system of tide signals at the mouths of harbours, particular lights and flags indicating the turn of the tide and the depth of water would be of great assistance to vessels on entering them.—728. No.—729. Never having had occasion to enter harbours where tide lights or signals are used, I am not in a position to give an opinion.—730. I do not recollect of finding a want of tide signals; but think there should be a uniform system throughout the coasts, with signal beacons to guide vessels into harbours when pilots cannot get to sea.—731. No.—732. No.—733. No.—737. No.—738. Never.—740. I have not.—741. No.—744. No; I have not been so placed at any time as to experience any such.—745. No.—746. No.—748. Not any.—749. No.—752. Never.—754. I have not.—755. No.—756. Never.—757. There is no proper tide lights for the use of vessels entering the Tyne. The only means of indicating (at night) the tide is the extinguishing of the harbour lights between half ebb and half flood. Captains of tug steamers have complained to me that during this period of the tide they have thus no harbour lights.

Vessels approaching the Tyne from the north with a north wind cannot see the state of the tide at night until they are to leeward of the entrance. A regular and efficient tide light should be attached to the Tynemouth lighthouse, where it would be visible from all points. There is such a tide light on Hartlepool Heugh Lighthouse.—758. No.—759. None; but I should think a very desirable thing for some parts of the coast.—760. I do not recollect.—762. No.—763. No.—764. No.—765. No.—769. I have felt great inconvenience at Aberystwith, Cardigan Bay; it is not at all times lit at two hours before high water, often not at all, in case they do not expect some vessel in that tide, which is dangerous to run for this part at night without being certain the light is up at tide there, which is very uncertain and dangerous.—770. No.—771. I have never experienced the inconvenience indicated.—772. No.—773. No.—777. I have never experienced any.—778. No.—779. No.—781. No.—782. I have found that the time for making the signal is generally a subject of calculation, instead of observation. A simple apparatus might be fitted to most lighthouses, which would acquaint the light keeper with the true state of the tide by night or day.—783. No.—784. No.—785. I have not.—788. As a river commissioner for the Tyne during the last five years, I beg to state, in answer to No. 12, that the two harbour lights for that river are lighted at first quarter flood, and put out at first quarter ebb. The consequence is, that vessels of small draught, which may be standing for port in easterly winds (when, perhaps, no pilots can get out on account of a heavy sea), are suddenly deprived, when in a critical situation, of the only directing means to safety, which, there can, I think, be no doubt, is not an unfrequent cause of wreck. It is palpable that those lights which are made tide-lights should be exclusively harbour lights, and a prominent tide-light, of some distinguishing colour, should be erected on an elevated point, that ships far at sea, before attempting the harbour or getting involved in the dangers and intricacies of its entrance, should be warned in time while a choice of their course is in their power.—791. Never.—792. Never.—793. Never.

13. Do you think that the Coasts of the United Kingdom are well supplied with Buoys and Beacons?

1. I do.—2. All channels coming under my notice are well supplied.—3. Remarkably well.—4. Yes.—5. Yes.—6. Yes.—7. Yes; though no doubt additions might be made here and there with advantage, were the case carefully gone into.—8. Generally they are; the beacons, Castlemaine Harbour, county Kerry, if kept in line, would run over the top of a dangerous bank.—9. Generally well supplied.—10. Yes; generally speaking.—11. Beacons wanted on some tidal rocks at Alderney.—12. Yes.—13. That part of the coast of Ireland which is intimately known to me, is grossly deficient in artificial helps to navigation.—14. I do.—16. I think so.—17. Yes.—18. Yes, to what they were when at sea.—19. Yes.—20. Yes.—21. Yes; better than any country I was ever in.—22. Yes.—23. Yes.—24. Yes.—25. Yes.—26. I consider that the coast is well supplied in my district.—27. Yes.—28. Yes.—29. Yes.—30. Yes.—31. Yes; extremely well.—32. Yes.—33. Yes.—34. In the locality for which I am a pilot, we have a good supply of buoys requiring some alteration.—35. Yes.—36. I do; but there is a necessity for more, I think two, buoys upon the S.E. part of the Longsound.—37. Yes.—38. Yes.—39. Yes, with the exception of instances, see No. 15.—40. I do not think there are any more buoys and beacons required in our channels.—41. Yes.—42. Yes.—43. Too well for some branches.—44. Yes.—45. Yes.—46. Yes.—47. Yes.—48. Yes; in my profession.—49. Yes.—50. Yes.—51. Yes.—52. Yes; that part of the coast with which I am immediately acquainted.—53. Yes.—54. Yes.—55. They are, to the best of my knowledge.—57. Yes; that part of the coast with which I am immediately acquainted.—58. Yes.—59. The Outer Dowsing a buoy is wanted as warning from the Baltic, ships would then know their position in time.—60. Yes.—61. I think we might have more of both.—62. I do.—63. Yes.—64. Yes.—65. Yes; that part of the coast with which I am immediately acquainted.—66. I do not know of any more buoys or beacons required in our channel.—67. Yes.—68. Yes.—69. Yes.—70. I do not know of any more buoys or beacons required in our channel.—71. Yes.—72. I think a further improvement might be made in size if not increased in number.—73. Yes.—74. As far as my experience goes I should say yes.—75. Yes.—76. Yes.—77. Yes.—78. Yes.—79. Yes.—80. Yes; I do.—81. I do.—

82. Yes.—83. Yes.—84. Yes; as far as I am acquainted.—85. I do.—86. Yes; as far as I am acquainted.—87. Yes; as far as my district extends.—88. Well supplied.—90. Yes; as far as my district extends.—91. Generally so, exceptions hereafter mentioned.—92. Yes.—93. I do.—94. The parts with which I am acquainted I think are well supplied.—95. Yes.—96. All except a beacon to be replaced on Monkstone.—97. Yes.—99. Yes.—100. Yes.

102. Yes.—103. Yes.—104. I think that generally they are so.—107. Yes.—108. Yes.—109. Yes.—110. Not able to judge or give an opinion.—111. I think buoys on Thedethorpe Middle and the Rose Sand on the Lincolnshire coast would be useful.—112. Yes.—113. I think there should be a buoy placed on the Selkirk Rock, which lies about a mile from Selkirk Point; two vessels were lost on this rock last winter, all hands of one and I think of the other, but not sure.—114. I never felt the want of any.—115. I do.—117. Yes.—118. Yes.—119. Yes.—120. I think it would be a benefit if a beacon was erected at the Keystone on the entrance to this port.—121. Yes.—122. I cannot say.—123. I think it would be a benefit if a beacon was erected at the Shagstone on the entrance to this port.—124. Yes.—125. Yes.—126. Yes.—127. Yes.—128. Yes.—129. Yes.—130. Yes.—131. Generally on the east coast.—132. Yes.—133. Might be better.—134. Yes; I do.—135. Yes.—136. Yes; better.—137. I do.—138. Yes.—139. Yes.—140. Yes; they are.—141. Yes.—142. Yes.—143. Yes.—144. Many parts of the Highlands require additional buoys and beacons.—145. So far as my knowledge extends, they are.—147. Yes.—148. I think the coasts are well supplied with buoys and beacons.—149. So far as acquainted.—150. There is room for improvement.—152. Yes.—153. Yes.—154. Yes.—156. Yes.—157. Yes.—158. Yes.—160. Yes.—161. Yes; to the best of my knowledge.—162. Yes.—163. Yes; such as they are, but larger buoys, such as they have now at Liverpool in our principal channels, would be much better.—165. I think they are.—167. Yes; as far as I have experienced.—168. Yes.—170. Yes.—172. Yes.—174. Yes.—175. I do.—177. Yes.—178. Yes.—179. I do.—180. So far as my experience goes I believe they are.—181. Yes.—185. I do think they are supplied.—186. Yes; as far as I know.—187. Yes.—189. Yes.—191. Yes.—192. Yes.—193. Yes.—194. Not sufficiently.—195. The coasts I am acquainted with, yes.—196. Yes.—198. Yes.—199. As far as I am acquainted, well.

201. Generally.—202. Yes.—203. Yes.—204. Yes.—205. Yes.—206. Yes.—207. Yes.—208. Yes.—209. Yes.—211. Yes.—212. Yes.—213. Generally they are so.—214. Yes.—215. Yes.—217. Yes.—218. I think they are sufficiently supplied.—219. I think if there were a buoy placed on the inside of Winterton Ridge, it would be advantage to mariners bound northward.—220. Yes.—221. Yes.—222. No.—224. Yes.—225. They are not; every bank ought to have beacons, as in the Gulf of Finland, long poles with iron one end, when moored, forms a beacon, and will stand any gale, with very little expense, except where the tide is too strong.—226. No.—227. Yes.—228. Yes.—229. Yes; generally.—230. Yes.—231. Yes.—232. I think if there were a buoy placed on Winterton Ridge, it would be a great advantage to mariners bound to and from the north, as it is a very dangerous shoal.—233. Yes.—234. Yes; there may be some exceptions, but, as a general rule, the United Kingdom is well supplied with buoys and beacons.—235. In general I do.—237. Not to be complained of.—240. No.—242. Yes.—244. Yes; need no improvement.—246. Yes.—247. Yes.—248. I think the coasts are well supplied with buoys and beacons.—249. Yes.—250. Yes, I do, with few exceptions.—251. They are in such of those parts which I have frequented.—252. I think more buoys are needed.—253. Yes.—254. I think the east coast of Scotland is very well supplied with buoys and beacons.—255. Too many buoys in the approaches of Liverpool.—256. Yes.—258. Yes; generally.—259. First rate.—260. Very well.—261. Very well.—262. As far as my knowledge extends, I am not aware of any deficiency.—263. Yes.—264. I think they are.—266. Yes.—269. Yes.—270. I do.—272. Yes.—273. I do.—274. Very well generally.—275. Yes.—276. Yes.—277. I think they are as far as I have seen.—278. Generally, pretty well.—279. No; the Rundestone is not sufficiently marked.—280. I do.—281. Yes.—282. Generally yes, but capable of improvement.—283. I do.—284. Yes.—285. Yes generally, except about the harbours of Scotland, particularly in Highlands and islands in north west of Scotland.—286. I think they are.—287. Every sunken or half-tide rock should have a buoy or beacon.—288. I do.—289. Yes.—291. I think all the coasts admirably buoyed off.—292. I do.—293. Well supplied in most places.—294. Generally.—295. Yes.—296. Never found any want of such.—297. Yes.—299. Yes; there are none better supplied of my acquaintance.—300. Yes.

301. There should be a beacon-buoy on the Rundestone, instead of the one at present in use.—302. Yes; but an uniformity in their colour, like the German buoys, would be desirable.—303. I do.—304. Yes.—306. Yes.—307. As far as I am acquainted.—308. Yes; as far as my experience goes, or according to my opinion.—310. I think an improvement may be made in this particular.—311. Yes.—312. Yes.—313. Yes.—314. The Irish Banks in St. George's Channel very deficient; there ought to be larger and more of them, with distinguishing marks on them for each bank.—315. Yes.—316. Yes; those ports I have named.—317. Yes.—318. I do.—319. Yes.—320. Yes.—321. Yes.—322. As far as my judgment goes they are.—323. As far as I have seen.—324. Long absence on a foreign station prevents my being able to say.—325. Yes.—326. Yes; those parts with which I am acquainted.—327. To the best of my knowledge it is well supplied.—328. Yes.—329. I think they are.—330. No.—331. Yes.—332. Yes.—333. Yes, to my knowledge.—334. Yes.—335. No.—336. Yes.—339. Yes.—340. I do.—341. Yes.—342. Yes.—343. Yes.—344. Yes.—345. Yes.—346. Cannot say.—347. As far as I know, yes.—349. Yes; the part of Channel I have named.—350. I do.—351. Yes.—352. Yes.—354. Yes.—355. Yes.—356. Yes.—357. Yes.—358. Yes.—360. Yes, as respects the Bristol Channel.—361. They are all well, as to Liverpool and London Rivers, also the east coast of England, they are well supplied with buoys and beacons, and many other places I have been in; no place better.—363. Middling.—364. Well supplied with buoys, but more beacons or land marks would be useful.—365. Yes.—366. Pretty well.—368. I do not.—369. I do.—370. Now they are.—371. The coasts I am acquainted are, except St. Ives Bay.—372. Yes.—374. No, there is a great want of proper beacons and buoys along this coast. The Commissioners of this navigation uphold a number of buoys along the coast, which, from the great wear of the mooring chains, require frequent renewal; and in winter time when they break adrift during heavy seas, considerable time elapses before they can be replaced. Instead of beacons, in many instances, I think Martello towers, such as at Leith Harbour, for the purpose of protection, as well as land marks, would be of immense advantage.—375. Yes.—376. Yes.—377. Want of knowledge to reply.—378. Yes.—379. Yes.—380. Yes.—381. Yes.—382. Yes.—383. Yes.—384. The coast I have named is entirely deficient in many parts.—385. Yes.—386. Yes.—387. Yes.—388. Yes.—390. Yes.—391. I do.—392. Yes, in my district.—393. Yes.—394. Yes.—395. Yes.—396. Superior to any other.—397. Yes.—398. Yes.—399. Superior to any other in the known world.—400. I do.

401. Very well supplied, generally speaking.—402. Yes.—403. Yes.—404. Yes.—405. Yes.—406. Yes, I think so.—407. Yes.—409. Yes.—410. Yes.—411. Yes.—413. Yes; what I have seen of it.—414. I do.—416. I think so.—417. I do.—418. Yes.—420. Yes.—424. I do.—425. I do.—427. Yes.—429. Yes.—430. Yes.—431. A large bell beacon is most wanting on King William Shoal, off Point of Ayr, Isle of man.—432. Yes.—433. Yes.—434. Yes, I think so.—435. Beacon off the Rundestone.—436. Yes.—437. Yes.—438. Yes.—440. Yes.—441. Yes.—442. Yes.—443. Yes.—444. Yes.—445. Yes.—447. So far as I am able to judge.—448. The Liverpool bell buoy is very small, would do much larger.—449. Yes.—450. Yes.—451. Yes.—452. Yes.—453. Yes.—454. Yes.—456. Yes.—457. Yes.—458. Yes.—459. So far as I am acquainted, yes.—460. About certain parts.—461. Yes.—462. Yes, generally.—463. Yes.—465. Yes.—466. Yes.—467. Yes.—468. Yes.—469. Yes.—470. Yes.—471. As far as I have seen.—472. Yes.—474. I do so far as I am acquainted.—475. Yes.—476. Yes.—477. Yes.—478. Yes.—480. Yes.—481. I do.—482. No far as I am acquainted I do.—483. I do.—484. Yes.—485. Yes.—486. I do.—487. In general I do.—488. I do.—489. I think two buoys on the shambles off Portland very necessary.—490. Yes, and much better than foreign coasts.—491. Any part that I am acquainted with are.—492. I do.—493. The various ports I have entered appear well buoyed.—494. I think the coast that I am most acquainted with well supplied.—495. To the best of my judgment the coasts of the United Kingdom are well supplied with buoys and beacons.—497. Very well.—498. The buoys are in general rather small where dangers exist.—499. Yes.—500. I do as far as I have found.

501. I do not think the North Channel is as well supplied as it requires.—502. Yes.—503. I think there are many places in want of buoys and beacons, the Whitestone Bank, off the Point of Ayr, Isle of Man; the Highlandman Rock, N.N.E. off the Maidens, is very dangerous, and many vessels have been wrecked on it.—504. I do.—507. Yes.—509. Yes.—510. Yes.—511. No.—512. Yes.—514. Yes.—515. Yes.—516. Yes.—517. With a few exceptions, yes.—518. A large cage bell buoy, one mile off the middle of

Arlow Bank, would be of great service.—519. Very well supplied.—520. The Irish and Bristol Channels are.—521. I would a larger buoy on the Alborough Napes, off Orfordness.—522. Generally speaking, yes.—524. Yes, well supplied, as far as my trade permits me to say.—525. Yes.—526. Yes, the portion I am acquainted with.—527. I do.—528. Yes.—529. Yes.—530. Yes.—531. They are.—532. Cannot say.—534. Yes.—535. Much improved latterly.—536. Yes.—537. I can suggest several requiring buoys and beacons.—538. Yes.—539. As far as I can recollect.—540. Yes.—541. From my knowledge I believe they are. Lord Clermont is now placing four large buoys, iron, 11 feet by 7 feet, nun, inside the bar for the better service in navigating the Lough.—542. Yes.—543. My experience of these matters having reference to a time and state of matters long past, any replies I could give would have no value.—544. In most instances they are.—545. I do.—546. Yes.—548. Yes.—549. Yes.—550. Yes.—551. Yes.—552. Yes.—553. Yes.—554. Yes.—555. Yes.—556. Yes, recommends a larger size.—557. Yes.—558. Yes.—559. Yes.—560. Cannot say.—561. There is a number of rocks on the west of Scotland, on which, if buoys and beacons were placed, would greatly assist the navigation.—562. Yes.—563. Yes.—564. Yes, the parts I am acquainted with.—565. I think the coasts of the United Kingdom are well supplied in general.—566. Yes.—567. Yes.—568. Yes.—569. Yes.—570. Yes.—571. I think that everything has been done to facilitate navigation.—572. The north and west coasts are very badly supplied with buoys and beacons.—573. Yes.—574. Yes.—575. Yes.—577. Yes.—578. Yes.—579. Yes, for the colonies. (See *Appendix to Mariners' Evidence*, p. 579.)—580. Yes.—581. I do.—583. Yes; except Rundlestone Rock at Land's End.—584. Rundlestone difficult to distinguish at night.—585. Generally well.—589. Yes.—591. Yes.—593. Nearly so.—595. I do think the coasts well supplied with buoys and beacons.—596. I think so.—597. I do.—598. Yes.—599. I do.—600. That part I am pilot for, yes.

601. Yes generally, but I must except the eastern side of the Irish Banks.—602. No.—603. Some parts.—604. I consider that the coasts of the United Kingdom are well supplied with buoys and beacons.—605. Yes.—606. I believe not, particularly in Beaumaris Bay.—607. Yes; but larger buoys should be more generally used in principal channels.—608. Yes; but large buoys should be brought more into use.—609. Yes; but larger buoys should be more generally used.—610. Yes, but may be better.—611. Yes, but large buoys should be brought more into use.—612. Yes, but additions and improvements may be made.—613. Yes.—614. Generally, yes; but to make them more efficient they should be larger in the principal channels.—615. Yes, so far as I have experienced, but I think large buoys should be generally used in the most important channels.—616. Yes, but the larger the buoys are the better.—617. I think Liverpool Bay is.—618. Yes, but large buoys like those in Queen's Channels might be more generally used.—619. Yes.—621. I think many places require buoys—off the Lizard and Hartland Point especially.—622. I have felt the want of a bell buoy instead of the present one on Holyhunter Rock, at the entrance of Carlingford Bay.—623. I do.—625. Yes.—627. Generally, yes.—628. I think so.—629. I think the coasts are well supplied.—630. I think they are.—631. Yes.—632. A shoal bay, and, I believe, yet lies, about north by west, about a mile and a quarter from the Dodgen, with about 14 feet water at low water; on this shoal I have not seen a buoy.—633. I do.—634. Yes.—636. I do.—637. Yes.—638. I do, but I think at the same time that a better one is required at Alborough Knaps.—639. Yes.—640. Yes, so far as I have experienced.—641. Well supplied, especially London and Liverpool approaches.—642. Yes.—643. To the best of my knowledge and belief I would say yes, generally.—644. Yes.—645. So far as I have experienced, should say yes.—646. So far as my knowledge extends, yes.—647. Yes.—648. Yes.—649. Yes.—650. Yes.—651. Although in my time very much has been done something may yet be done in that respect.—652.—Local experience not sufficient to form an opinion.—653. Yes.—654. From my experience I do, but coasters are better qualified to say than ship masters.—656. Speaking generally, yes.—657. Very well supplied.—658. Yes.—660. Yes.—665. Yes.—666. All the parts of the English coast I am acquainted with I think are sufficiently supplied with buoys and beacons for the purposes of navigation.—667. Yes.—668. Yes.—671. Generally I think they are, but in some harbours, Milford Haven, for instance, I think some buoys on the Pulchroggan Flats would be very useful.—674. Yes.—675. A buoy on south-west end of Skerries would be useful.—676. Yes.—677. I think it very much improved to what I have seen it, but still want more.—678. Yes, but I think it would add much to the safe

navigation of the coasts if distinguishing beacons were placed on some of the principal headlands to enable strangers to distinguish one part of the coast from the other in thick weather.—679. Yes.—680. Yes.—683. Yes.—685. Very well.—686. Not in all places.—687. Well supplied.—688. Cannot decide.—689. Yes.—690. Yes.—691. Yes.—692. Yes.—693. Yes.—694. Yes.—695. Yes.—696. Yes, so far as I have experienced.—697. Yes.—698. Yes, in English Channel.—699. Yes, in the English and Irish Channels.—700. Yes, as far as I have visited them.

701. Yes.—702. Yes.—703. Yes.—704. Yes.—705. Yes.—706. Yes.—707. Yes.—708. No.—709. I do.—712. I would recommend that a bell buoy be placed on the Clipperr Rock, Holyhead Bay, in lieu of the one now there; also a black nun buoy with conical top on the north end of the Kish Bank, county of Dublin.—713. No.—714. Might be better supplied in certain places by larger buoys.—715. I think they are.—716. Cannot say.—717. Rock lighthouse wants a gong or a large bell in the place of the present one,—does not make a sufficient alarm for vessels to know in time; and also buoys in Rock Channel on the north bank are too small, namely, Nos. 2, 3, 4, 5, and 6 nun buoys, Liverpool.—718. Yes, if of a larger size.—719. Much room for improvements in the buoyage of the Rock Channel, port of Liverpool.—720. Yes, but larger buoys and beacons would be better.—721. Quite as well, but, generally speaking, the buoys are too small.—722. Yes, they are.—723. Some of the buoys in the Liverpool Channel are too small.—725. The coast in and about Stromness seems to be well supplied with buoys, but a beacon is much needed on the Skerries of Ness, near Stromness, vessels often going on shore there, in the night time especially.—726. Yes, except on the north-west coast of Scotland. There can be no greater service rendered to the navigation of our coasts than the erection, wherever practicable, of permanent stone beacons, or of iron ones, in the place of floating buoys. The obelisk on the Wolf Rock, near the Land's End, has converted a danger into a useful landmark. A similar one on the Rundlestone would be very serviceable. In short, these permanent beacons have every advantage over buoys. They are visible to a much greater distance, their shape can be endlessly varied, and they are not liable to wash away, put where they are most wanted.—727. There are, certainly, many buoys that cannot be seen any distance.—728. Yes.—729. Yes.—730. I think the coasts of United Kingdom with which I am best acquainted are very well supplied with buoys, so far as the number goes, but think there might be more beacons in the place of buoys in some parts.—732. Yes.—735. Yes.—737. Yes, generally; but large buoys, such as now used in the Queen's Channel, would materially facilitate navigation if used in all principal channels round the coast.—738. Yes.—739. No.—740. They are.—741. Yes.—742. No.—743. Generally well, I believe; but I have retired these 11 years from sea service.—745. Yes.—746. Yes.—748. Yes.—749. Yes, with those parts I am acquainted with.—750. No.—752. Yes.—754. So far as my experience goes, there is no want of others.—755. Yes.—756. Yes.—758. Yes.—759. Yes, in most parts.—760. I think that the United Kingdom, or the coasts thereof, with the exception of the north and west coast of Ireland, are well supplied with buoys and beacons.—761. Well, as far as I could judge from limited opportunities; but some beacons or lights might still be placed with advantage; viz., on the Barrels Rock (half tide), which caught up the *Arctic*; and on the Collough sunken rock, rising to within 30 inches of the surface at low springs, both almost in the fair-way round Carnsore, south of Wexford, inside the Tuscar.—762. Not competent to judge.—763. Yes.—764. Yes.—765. Yes, but may be improved.—770. Yes; but in some places they are too small, particularly south-west Shingles, in Needles' Channel.—771. Yes, as far as I know, I think every danger is pointed out.—772. Yes.—773. Yes.—774. No.—775. They are upon the whole well supplied, but there are places where additional ones would be of great service.—776. Generally, with two or three exceptions; (viz.) Outer Dowings, Winterton Ridge, and Hammond's Knowl, North Sea.—777. I think it is.—778. Yes.—779. Yes.—780. Not in Lochindab, where both are very much required to save property.—781. Yes.—782. Yes, generally.—783. Yes; but for important channels large buoys should be brought more into use.—784. Yes.—785. I think they are.—786. Upon the whole I think they are.—787. Galway Bay is not.—789. More are required.—790. Yes, better than any foreign port or coast that I am acquainted with.—791. No.—792. No.—793. No.

14. Do you think that the Coasts of the United Kingdom are as well supplied with Buoys and Beacons as those Foreign Coasts which you have already named at Question 2? If you do not, name the country best supplied.

3. Those parts of the United Kingdom with which I am acquainted are well supplied.—4. Better than any foreign port or coast I am acquainted with.—5. I think the north-east coasts of England are quite as well supplied with buoys and beacons as any foreign coasts I am acquainted with.—7. I think they are, generally speaking, for where the buoys are more numerous over sea, it results from the special character of the navigation.—10. Yes.—12. Much better.—13. Have no information.—14. I think quite as well for their locality.—16. I do.—17. I do.—18. Yes, in this shape I prefer, as they stand high.—21. Better than any country I ever navigated.—24. Yes.—25. I think that our coast is as well supplied as the coast I named.—31. I do.—32. A great deal better; scarcely any buoys are on the numerous sandbanks between Dunkirk and Flushing.—33. Yes.—36. They are, I think, quite as well supplied. Their uniform system as regards placing their buoys is better than the system in this country. You cannot mistake their buoys or their channels for this reason,—their white buoys are placed upon the starboard hand, going inwards, and black buoys upon the port side, and the red buoy as fair way buoys, which is not the case in this country.—38. Lighted better.—39. No; the buoys in France being much larger, are preferable on that account.—42. Yes.—43. England.—45. Yes.—46. Yes.—47. Yes, quite as well, if not better.—48. I do not particularly recollect seeing the buoyage of foreign countries, but I do believe our own coast and channels are well buoyed and beacons.—49. Yes.—54. Yes.—59. Yes.—61. I consider the system of buoyage in the United Kingdom preferable to those parts I have named; for instance, in the Gulf of Finland, where there are very many shoals, they use flags on poles. This I disapprove of.—62. I do.—64. I am unable to give an opinion.—69. I think they are.—72. Yes.—73. Yes.—75. Yes.—76. Yes.—77. Yes.—79. Yes.—80. Yes, I do.—81. Better.—83. Yes.—85. I do.—94. I think them as well supplied as any foreign coast I have been at.—97. I consider the coasts of the United Kingdom the best supplied.—100. Cannot say.

102. Yes.—103. Yes.—107. Yes, and much better.—108. Second to none.—110. I have always thought the continental nations kept their channels more clearly and better buoyed than ours, more especially the Dutch and Danes.—111. I have no knowledge.—113. I think much better.—114. Yes, I think so.—115. I think the coasts of the United Kingdom are as well or better supplied than the foreign coasts already named.—116. Yes.—118. Yes.—119. Yes.—121. Yes.—122. I do not know.—124. Yes.—127. I do.—128. I do.—129. All well supplied.—130. The coasts of the United Kingdom are better supplied than any coast with which I have been acquainted.—131. Yes.—134. Yes, I do.—136. England.—137. Better.—138. Yes.—139. Much better.—140. Nil.—141. Yes.—144. The buoys and beacons are of a better description than those used in the Baltic, but not so numerous.—145. Quite as well; generally better.—147. Yes.—148. I think the United Kingdom is better supplied than any foreign coasts.—149. I do.—150. The coast and shoals of the United Kingdom are buoyed and beacons better than any foreign coast.—152. They are as well supplied as any other country.—153. Yes.—156. Much better.—157. Yes.—158. Much better.—159. Yes.—160. Yes.—161. Yes.—162. Better supplied in the United Kingdom.—163. The Dutch coast for numbers, but not for size.—165. I think they are better supplied than any of the coasts mentioned in No. 2.—167. Yes.—170. Yes.—172. Yes.—175. Much better.—177. Yes.—180. So far as my experience goes, I think the coasts of the United Kingdom are as well supplied with buoys, beacons, &c., &c. as any other.—181. Great Britain above all.—185. I think the English coast is best supplied.—186. Better.—189. Yes.—191. Yes.—193.—Yes.—195. Yes.—198. Nil.

201. Yes.—202. Much better generally.—203. Yes.—204. Decline giving opinion.—205. Yes.—206. Yes.—208. Yes.—209. Fully as well.—212. I do.—213. Yes.—214. Yes.—215. Yes.—216. Yes.—217. I think our coast is as well as any I have seen.—218. I do think they are.—219. The British coast is preferable to any foreign coast in buoys or beacons that I am acquainted with; but the

Dutch coast is preferable to the Belgian and French coast in buoying.—220. Yes.—221. Yes.—225. The Gulf of Finland is better managed with beacons. Poles moored round each bark, with a flag or cask on top of each pole, thus it forms a beautiful beacon, visible a long distance.—226. Yes; much better.—227. Yes, and much better.—228. Better than any country I ever visited.—229. Yes.—230. Yes, much better.—231. Yes.—232. I have every reason to think that the British coast is preferable to any other coast with buoys and beacons, but the method of placing the buoys white on the starboard hand, and black on the port as in the channels on the coast of Holland and Belgium is far better for a stranger to distinguish.—233. I do.—234. Yes; I am of opinion the United Kingdom is as well supplied with beacons and buoys as any foreign nation or country, and as well attended to, so far as my experience has been concerned.—245. Yes; I do.—247. England is well supplied. Some ship masters would have buoys in sight of each other, which would end in ships sinking buoys and buoys sinking ships.—238. I think the coast is well supplied with buoys and beacons.—239. I think the coast is well supplied so far as I know.—242. Better.—244. Yes; those countries named are in general badly buoyed and beacons.—249. Yes, better.—250. Yes, and better than any foreign coast that I have seen.—251. Full as well.—253. Much better.—256. Yes.—257. I do, and much better.—258. Yes.—260. Better.—261. Much better.—262. I think the coasts of the United Kingdom are better supplied with beacons and buoys than any foreign country I have seen.—266. Yes, better.—269. The English coast is equal to foreign coasts.—270. Yes.—272. Yes, better than any foreign country.—273. England.—274. I do not know any foreign coasts better supplied with buoys and beacons than the coasts of the United Kingdom.—275. Yes.—276. Yes.—277. I have always found the United Kingdom better supplied than any foreign coasts I have been on.—278. Yes.—279. Yes. 240. I consider better.—281. Yes.—283. I do.—284. Much better.—285. Yes. Gulf of Finland has a uniform, simple, and efficient system; on south side of a shoal, red flag, beacon, and broom branches downward; on north side, white and broom branches pointing upward. These may be seen at a great distance with a spyglass, and are the same over all Russia. These must, of course, be renewed annually on account of the ice.—286. I think our coasts are better supplied than those of foreign countries.—287. I think the coasts of the United Kingdom are best supplied.—288. I do.—289. United Kingdom.—291. Much better than any other country.—292. Yes.—293. I think much better.—294.—Yes.—296. Better.—297. The United Kingdom is the best supplied.—299. Yes.—300. Yes.

301. Yes.—302. Much better, except the Elbe and Eider.—303. I do.—306. Nil.—308. The coast of the United Kingdom is much better supplied than any foreign coast I have been at.—309. I think they are.—311. Yes.—312. Yes.—313. Yes.—315. I do.—316. Our own very much better.—317. Yes, to the best of my knowledge.—318. I do, and much superior to any coast I have ever navigated.—320. Quite as well.—321. Yes.—322. The Gulf of Finland and the ground off Copenhagen is well buoyed and beacons, but not better than the United Kingdom.—323. Unknown.—325. Better supplied.—326. Yes.—327. I think the English shores better supplied with these marks.—328. Yes.—329. I have not named any at Question 2, not having been foreign.—331. Yes.—335. Yes.—336. Yes.—339. Yes.—340. I think they are.—342. Yes, much better.—344. United Kingdom.—345. Yes.—347. Yes.—349. I do not think they are as well supplied with lights as the coast of France.—350. I do.—351. Yes.—352. Yes.—354. Yes.—355. Yes.—356. England.—358. I think our coast the best lighted of any before named.—359. I do believe that the coasts of the United Kingdom are as well, if not better supplied with buoys and beacons as those of the coasts I have visited.—361. None of the foreign coasts so well as those of the United Kingdom.—363. Yes.—364. Better supplied with buoys for numbers. Coast of Norway and Baltic better supplied with beacons landmarks.—365. Quite equal to any other.—366. Cannot say.—369. England.—370. Do not know.—372. Yes.—374. See answer to No. 5 Question.—375. Yes.—376. Yes.—377. Answered in No. 13.—381. Yes.—383. Yes.—385. Yes.—386. Better.—387. Yes.—388. Yes.—390. Yes.—395. Far better than any foreign coast that I know.—396. None better than England.—397. Yes.—398. Yes, better.—399. British best.—400. I do.

401. Better than those named at Question 2. No other country is so well supplied.—402. United Kingdom best supplied.—403. Better.—404. In my opinion much better.—405. Yes.—406. Yes.—407. Yes.—409. Better.—410. Yes.—411. Yes.—413. Yes.—414. Better.—416. Yes.

—417. I do; and much better.—418. Yes.—420. Better.—424. I do.—425. I do.—427. Yes.—428. They are.—429. Yes.—431. Yes.—432. Yes.—433. Yes.—437. The Sand Heads and river Hooghly.—436. Yes.—437. Great Britain.—438. Yes.—440. Yes.—441. England.—442. As well as any I know.—443. United Kingdom.—444. Yes.—445. Yes.—446. Yes.—447. Yes.—448. Yes.—449. England.—450.—More so.—451. Yes.—452. Yes.—453. Yes.—454. Far better.—456. Far better.—457. Yes.—458. Yes.—459. Better in England.—460. About equal.—461. Much better.—463. Yes.—465. Yes.—466. Yes.—467. Yes.—468. Yes.—469. Much more so.—470. Better.—471. Yes.—472. Yes.—473. Yes.—474. I consider the United Kingdom better supplied than any other country that I have been to.—475. No. I think the French system of buoying harbours superior to ours, as at Toulon, Marseilles, &c.—476. Yes.—480. Yes.—482. I know of none better supplied than the United Kingdom and her dependencies.—483. I consider the coasts of the United Kingdom best supplied with buoys and beacons of any country in the world.—484. I think it as well, but know few places where a good system is so much required.—485. Yes.—486. I do.—487. I do.—488. Better.—489. I believe they are more efficiently so.—490. I do.—491. The Gulf of Florida is the best for beacons of any place I know.—492. Yes.—493. I think them quite as well buoyed as any other country I have been at.—494. I think the coast of the United Kingdom better supplied with buoys and beacons than any coast I know.—495. I beg to refer you to answer given at Question 4.—497. Much better.—498. Yes.—499. Much better.—500. I do as far as they are requisite.

501. I am sure that the United Kingdom is better supplied, generally speaking.—502. Better.—504. Yes, and better than any of them.—505. Nil.—507. See No. 2.—511. Yes.—512. Yes.—515. Yes.—516. Yes.—517. Much better.—518. I know of none.—519. I believe the United Kingdom as well supplied as can be on any coast.—521. I do think the coast of England as well supplied as any other.—522. Yes.—524. I think they are superior to the French in that respect.—527. I think much better.—528. A great deal better.—529. Much better.—530. They are.—531. They are better.—532. Cannot say.—534. Yes.—536. Quite as well.—538. Yes, better.—541. I should say much better.—542. None better supplied than England.—543. The Elbe was better supplied than any British river I have been in.—544. Better.—545. I do.—548. Yes.—550. Yes, and better.—552. Yes.—553. Always have found it so.—554. Yes.—555. Yes.—556. Yes. I do.—557. Yes.—558. Better.—559. Yes.—560. Cannot say.—562. Yes, generally better.—564. Yes; I do think it as well supplied.—565. I think quite as well as any foreign coast that I have seen.—566. Yes.—567. Yes.—568. Much better.—569. Do not know.—570. Yes.—571. There is no coast better buoyed than the British.—573. Yes.—574. Yes.—575. Yes.—577. Yes, better.—578. Yes.—579. Yes, and much better than any foreign coast, more especially the Gulf of Finland, the buoyage of which is exceedingly defective. I may also mention the grounds on Saltholm side and Scaw Reef.—580. Yes.—581. I think the coasts of the United Kingdom are better supplied.—583. Yes.—584. Yes.—589. Yes.—590. Yes.—591. Unacquainted with foreign coasts.—593. The coasts of the United Kingdom are better supplied than foreign coasts.—595. I do think the coasts of the United Kingdom better supplied with buoys and beacons than the coast I have mentioned in Question No. 2.—596. I think the coast of the United Kingdom is better supplied than any foreign coast that I know.—597. None better than the United Kingdom.—598. Yes.—599. I do.—600. Yes.

601. I have not named the entrance of the Hooghly, as I have not been there for many years; but the buoys there are to my recollection the best I have ever seen.—602. Named none.—604. I think that the coasts of the United Kingdom are better buoyed and beacons than any of those foreign coasts which I have already named at Question 2.—605. Yes.—606. Yes.—613. Much better.—619. Yes.—621. From what I have seen of foreign coasts I am fully of opinion that English coasts are much better provided with buoys and beacons.—622. I do. 623. Yes.—624. Yes.—625. Better.—627. Yes.—628. I think the coasts of the United Kingdom are as well supplied as any foreign coast.—629. I do not know any other coast so well supplied as the United Kingdom.—630. I think the coast of the United Kingdom are better supplied.—631. Certainly; quite as well.—632. Yes.—634. Cannot say.—636. I do.—637. Yes.—638. I do.—639. I think the British coast is by far better attended to than any foreign coast I know of.—640. Better.—641. Much better.—642. Yes.—643. Yes.—644. Yes.—645. Superior in every

way to any foreign country I have visited.—646. Yes; I think them as well supplied.—648. Yes.—649. Yes, better.—650. Yes.—651. If I were to measure the benefits conferred on navigation by the money levied on our ships for lights, buoys, and beacons I rather think a money remainder might appear applicable to further improvements.—652. Yes, and better supplied.—653. Yes.—654. Better, and there is greater need.—656. Yes.—657. Better than any foreign coast, port, or harbour I have ever visited.—658. Yes.—660. Much better.—665. As well.—666. I think the parts of the English coast I am acquainted with well supplied with buoys and beacons, and better than any foreign coast I have seen.—667. Yes.—668. I do.—671. I think the coast of the United Kingdom better supplied with beacons and buoys than foreign countries.—674. Yes.—675. Better.—676. Better supplied.—678. Yes.—679. Yes.—680. Yes.—683. Much better.—685. Yes, and better.—686. Yes.—687. The coasts of the United Kingdom I think is better supplied.—688. Yes.—690. Yes.—691. Yes.—692. Yes.—693. Yes.—694. Yes.—695. Better.—696. I do not know any foreign coasts so well supplied as those parts of the United Kingdom with which I am acquainted.—697. Yes.—698. Yes.—699. I believe so.—700. Yes; far better.

701. I think they are much better.—702. Yes.—703. I think the coasts of the United Kingdom better supplied with buoys and beacons than any country I have seen.—704. Quite as well supplied.—706. Better.—707. Yes.—708. Elbe River, Weser River.—709. Equally.—715. Not able to give an opinion for the reason stated at No. 2.—716. Cannot say.—717. I cannot say.—719. None.—720. Yes.—721. I do.—723. I cannot say.—724. I do.—727. I have never seen any better than the United Kingdom.—728. Yes.—729. Quite as well.—730. I think the coasts of the United Kingdom are better supplied with buoys than any foreign coasts that I have navigated; the River Elbe appeared to me to be well buoyed.—732. Yes.—733. Better.—738. Quite as well.—740. I do.—741. Yes.—745. I think they are better supplied than the foreign coasts I have mentioned.—747. I think they are, and, in case of their breaking adrift, are much sooner replaced on our own coasts.—748. Yes, better.—750. The buoys are generally too small, and there is a want of a uniformity of system in buoying.—752. Yes, and better by far.—754. I consider them far better supplied.—755. Yes.—756. As well.—758. Much superior.—759. Yes.—760. I cannot say.—762. Much better.—763. Yes.—771. Much better buoyed and beacons than any foreign coasts I know.—772. Well lighted and buoyed; no country better.—773. Better.—777. I think it is.—778. Yes.—779. Better.—781. Yes; better.—784. Yes.—786. I think the coasts of the United Kingdom are better.—789. Yes.—790. Yes.

15. Have you ever felt a want of Buoys or Beacons on any part of the Coast of the United Kingdom?—and if so, where?

1. I have not.—2. No.—3. No; I have not.—4. No.
5. I have never felt the want of buoys or beacons on any part of the coast, or on any sand bank except the Outer Dowling.
6. No.
7. The omissions have been filled up from time to time, and there are now no material wants on any portions of the coasts I am acquainted with.
8. The beacons, Castlemaine Harbour, should be so placed as to be in line when in the deepest water over the bar, or a buoy should be placed there.
9. Yes; Lantiriet bay, $2\frac{1}{2}$ miles eastward of Forney (to mark the position of the Udder Rock). Temporary beacons have been erected by the Admiralty Survey, Marks in Falmouth Harbour difficult to distinguish unless locally acquainted. Buoys wanted to denote the Channel up to Mopus.
10. Yes, and have from time to time, on the discovery of dangers, represented such necessity, which has been attended to by the Trinity House.
11. Alderney.
12. At outer end of Mewstow Ledge, east point of entrance to Plymouth Sound.
13. My answer to 13 applies to this. The deficiencies are general, and too numerous to mention here; suffice to say, that none of the harbours or roadsteads but those that are strictly trading ports have any buoys or beacons, although there are many excellent reefs.

14. Formerly, but not now.
 15. No.
 16. I think a large bell buoy placed at the entrance of the Needles, such as they have at Liverpool, for ships to make in thick weather, would be a great advantage.
 17. Never.—18. No.—20. No.—21. No, never.—22. No.—23. No.—24. No.—25. No.—26. No; I have not.—27. No.—28. No.—29. No.
 30. None now.—31. No.—32. None at present.—33. No.—34. Do not know the want of any extra buoy.—35. No.
 36. Upon the Longsand, as I stated above, No. 13, from the Shingles beacon downwards.
 37. No.—38. No.
 39. A buoy on Pennington Spit, and a beacon on Cadland Point in Southampton Water.
 40. There are no more buoys and beacons required in our channels, for they are well buoyed and beacons.
 41. No.—42. No.—44. No.—46. No.—47. No.
 48. None, to the best of my knowledge.
 49. No.—50. I have not.—51. None.—52. No.
 53. Buoy on Rundlestone not sufficiently buoyant for chain and set of tide.
 55. Never.—57. No.
 58. Buoy on Rundlestone not sufficiently buoyant for chain and set of tide.
 59. I think a larger buoy on the east part of the Cross Sand would certainly be of great service.
 60. No.
 61. I cannot remember to have felt any particular inconvenience, but am of opinion all that can be done ought to be to mark out the shoals.
 62. No.—63. I have not.
 64. I am of opinion that a buoy on the eastern part of the shingles on the Princes Channel abreast of the East Tongue buoy would facilitate the navigation.
 65. No.—66. Not any.—67. No.—68. No.—69. I have not.—70. Not any.—71. No.
 72. Not particularly.
 73. Nowhere; all in their proper place.
 74. No.—75. None.—76. No.—77. No.—78. No.—79. No.
 80. Not any part that I am acquainted with as it is now buoyed.
 81. No.—83. None.—84. I have not.—85. I have not.—86. I have not.—87. No.—88. Never.
 89. The Deputy Buoy should be larger, also the Brigg Buoy near the Copeland Islands.
 90. No.
 91. On the west coast of Scotland.
 92. Yes, on the Monkstone.
 94. No.—97. No.
 99. Outer Dowsing.
 100. No.—101. No.
 102. Outer Dowsing, north end lies about 34 miles south-east by east from the Spurn Point lights.
 103. No.
 104. Yes, frequently at Rattray Head.
 106. A beacon on the Monkstone is required.
 107. No.—108. No.
 110. Do not recollect.
 111. No, except as above named.
 112. No.—113. No.—114. I never felt the want of any.—115. Never.—116. Not of late years.—117. No.—118. No.—119. No.—120. Never.—121. No.—122. No.—123. Never.—124. No.—125. No.—126. No.—127. I have not.—128. No.—129. No.—130. No.—132. None.
 133. Knock Channel.
 134. Yes, in the Princes Channel, but when the authorities saw its necessity it was immediately done.
 135. No.
 136. Lynnwell wants two buoys on the Roger and one on the Long Sand.
 138. No.—139. No.
 140. Lynn Deeps on the Roger, and a buoy on the Point of the Longsand, in case the floating light at any time should drift from her moorings.
 141. No.—142. No.—143. No.
 144. Loch Carron, Point of Harris, and many of the lochs of the Western Highlands.
 145. Never.—147. No.—148. I have never felt the want of any buoys or beacons on any part of the United Kingdom.—149. Never.
 150. I have not felt the want of any myself: still, I believe on the east of the kingdom various improvements might be made.
 152. No.—153. No.—154. No.—156. No.—157. No.—158. No.—159. No.—160. No.—161. No.—162. No.
 163. Yes; there is great want of a good beacon on the Blacktail, and means used to prevent the Essex people from lodging strange ships into Blacktail Swashway, and their making by a deceptive light of their own a prize.
 165. Have never experienced any want of buoys or beacons.—167. No.
 168. Yes; the want of a buoy on the Outer Dowsing, east coast of England.
 170. No.—172. No.
 174. Not recollect.
 175. I have not.—177. No.—180. I never have.—181. No.—183. No.
 184. Yes; east coast of Ireland, Colling Bank and Kisk Banks.
 185. No.—186. No.—187. No.—189. No.—191. No.—193. No.
 194. Blakeney overfalls.
 195. No.
 196. One beacon, Chicken, Isle of Man, one beacon east end of the Little Copeland, one buoy port feet Killwot Point, Belfast Lough.
 198. No.—199. No want.—201. No.—202. No.—203. Not lately.—204. No.—205. None.—206. No.—207. No.
 208. I have often thought the island of Stroma in Pentland Firth.
 211. Not now.—212. No.—213. No.—214. None.—215. No.—217. Never.—218. I have never felt the want of any.
 219. I have felt the want of a buoy or lightvessel on the Outer Dowsing when bound to or from northward heavy draft.
 220. No.
 221. When I last passed the Monkstone (Bristol Channel) the beacon was down; I am not aware of its being replaced.
 222. No, not personally.—224. No.
 226. Winterton Ridge and Outer Dowsing.
 227. No.
 228. Not particularly. The large (black) nun buoys are excellent for such places as Inner and Outer Dowsing, Race Bank, and such spots.
 229. No; but I have seen another vessel which could have been saved from stranding, in my opinion, if there had been a buoy. I consider it very desirable that a buoy should be placed on the most southern point of Spurn, as I have known several vessels get on shore there, and only last year a Dutch galiot, which I consider would not have occurred had there been a buoy there.
 230. No.—231. No.
 232. I have felt the want of a buoy or a lightvessel on the Outer Dowsing, when bound either north or south, with a heavy draught and head wind, as the water is very shoal.
 233. On the Cross sand a beacon would be of great service, as the bays cannot be seen at a sufficient distance in bad weather to avoid danger.
 234. Not any, so far as my experience goes, but a beacon on the Cross sand at the back of the Yarmouth sands would be a great benefit, especially for strangers, as buoys dip too much in bad weather.
 235. In South-west reach, between the west of Barrow buoy and the Middle light, for ships reaching over or wishing to anchor with easterly winds. And on the west side of Halsbro sand, midway between the South-west buoy and the lightship.
 237. Not since steam has become prevalent.
 240. On north-west end of Whitestone bank near point of Ayr, Isle of Man.
 242. No.
 244. Buoy. Varne, where a buoy is now placed.
 246. At the Otter Aird of the Island Devon, and the Smerby Rocks.
 247. No.
 248. I have not felt the want of any buoy or beacon.
 249. No.
 250. I have, on the Crow Rocks, near Milford, another on a rock in Ramsey Sound. These require beacons.
 251. Never.
 252. Yes. South-west elbow of the Owers, south south-west end of the Boulder, Pennington Spit, Brook Ledge, Freshwater Bay, Kinnerage Ledge, and Skerries Start Bay.

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253. Never.—256. No.
 257. River Shannon.
 258. Should be a buoy off the North Briggs or Potts Rocks north side of Belfast Lough.
 259. No.—261. Never.
 262. I have not.—263. None.
 264. Lynn Deeps, one on the Long sand and one on the Roger.
 266. No.
 268. A buoy on the Vrong rock near the Lizard would be requisite on which the *Czar* was lost.
 269. Not any.—270. No.
 271. Selkin rocks, 12 miles south of St. Bees Head.
 272. None.
 274. I have found the want of a buoy on rocks called the Stones, which are about four miles E.N.E. of St. Bees Head; there is, however, a black buoy now near the reef.
 275. No.—276. No.—277. I never have.
 278. Yes; I have found the want of a buoy on Hilsford Spit, south end of Walney Island.
 279. No; with the exception of the Rundlestone above mentioned, near Land's End.
 280. Not since the improvements of late years.
 281. No.
 282. Lough Carlingford.
 283. No, never.—284. No.
 285. Yes; in Sound of Sky, Sound of Mull, Sound of Islay, harbours and channels in Lewis Islands.
 286. I have not.
 287. Paterres Rock of Sana should have a buoy or beacon on it.
 288. I have not.
 290. A buoy is wanted on Barrsalloch Point, in the Bay of Luce, in the county of Wigtown, where the ship *Sir Howard Douglas*, of Liverpool, was lost a few years back.
 291. None.—292. I have not.—293. No.
 294. Rattery Briggs.
 296. No.—297. No want.
 299. No; I have always found a sufficient quantity of buoys in the channels that I have navigated to avoid dangers.
 300. Yes, on the north end of the Outer Dowsing in the North Sea.
 301. No.—302. Not of late years.
 303. I have not.—306. No.—307. None.—308. No, never.—309. Not anywhere.
 310. I think the south-west part of the Owers and Boulder should each have a buoy; that there should be a buoy on Pennington Spit, and one on Brook Ledge.
 311. No.—312. No.—313. No.
 314. Arklow Bank, on the east coast of Ireland, ought to be buoyed along the outside, and not more than one mile apart, the bank being 12 miles long, with only 2 buoys on it, one at each end, and not more than 8 to 10 feet of water on some parts at high water.
 315. I have not.
 316. Not as those parts already named are buoyed and beaoned at present.
 317. No.—318. I have not.—319. No.—320. No.—321. No.—322. No.—323. No.—324. No.—325. No.
 326. A small beacon on the Bullock Rock on the west side of Admiralty Pier, Dover, would be of great advantage to vessels using the pier. Although it lies close in shore we go close to it in turning round to berth ship at the pier, with head to the south ready to start.
 327. No.—328. No.—329. I have not.
 330. Yes; Chester Bar and approaches to the river Dee.
 331. No.—332. No.—333. No.—334. No.
 335. Yes; a beacon on the Rundlestone near the Land's End.
 336. Not of late.
 337. I have felt the want of a bell buoy at the end of Filey Bridge.
 339. Not of late.
 340. I have not.—342. No.—343. No.—346. None.
 347. There should be a beacon on the Brandies Rocks near the Saltee Islands.
 349. Yes, going into Portland Roads.
 350. I have not.—351. No.—352. No.—353. None.—354. No.—355. No.—356. No.—358. No.—359. No.—360. Never felt any.—361. None.
 362. On St. Patrick's Rocks, Killala Bay, a beacon very much required.
 363. Have felt the want of a buoy on Baggy Leap, near Morte Point, Bristol Channel.
 364. Have experienced a want of beacons.
 365. Yes; at Kingroad, where there is only one buoy on the Cockram Shoal, although there are a number of other shoals in the vicinity.
 366. No.
 368. I have, off Godway Stones, St. Ives Bay.
 369. I have not.—370. No.
 371. I have not, with the exception of St. Ives Bay.
 372. No.
 374. I think the coasts of the United Kingdom could be much more efficiently provided with beacons and buoys.
 376. No.
 377. Answered in No. 13.
 381. No.
 383. Rattray Head, in Aberdeenshire.
 384. Yes, at Castle Townsend, Long Island Channel, and particularly the Kenman River.
 385. Not of late years.
 386. No.—387. No.
 388. Cannot say.
 389. Another buoy between the two buoys near on the Dutchman's Bank, Menai Straits; also a buoy on Beaumaris Bank.
 390. No.
 391. At the Bahama and White Stone Banks off Point Ayr, Isle of Man.
 392. Not as far as my knowledge goes.—393. No.
 394. At the entrance of Chester River a large beacon buoy wanted in the place of the small one on the south-west end of the Earwig Patch.
 395. Yes, at north end of South Ridge Bank of Wicklow.
 396. No.—397. No.
 398. Yes, on Coningbeg and Coningmore Rocks, which are half-tide rocks, with no buoy or beacon on either.
 399. No.—400. Never.
 401. Yes; formerly in the Bristol Channel and on the Irish coast (now supplied).
 402. No.—403. No.—404. No.—405. No.—406. No.—407. No.—409. No.—410. No.—411. No.
 412. Paa 51° 1' Bay 1° 20' L. O. Greenwich, benannt Varne.
 413. No.—414. Never.—416. No.—417. I have not.—418. No.—420. No.
 423. None, so far as I know.
 424. I have not.—425. No.—427. No.—429. No.—431. As above.—432. No.—433. No.—434. No.
 435. A buoy wanted on Kimerage Ledge near St. Albans, also one on the Skerries near the Start Point.
 436. I have not.—437. No.—438. No.—440. No.—441. No.—442. No.
 443. The Blackwater bank on the Irish coast.
 444. No.—445. No.—446. No.—447. No.—449. None.—450. No.—451. No.—452. No.
 454. Inner Gabbard and Outer Dowsing.
 455. No.—456. None.—457. No.—458. No.—459. No.
 460. Yes, on the eastern coast of Britain.
 461. Never.—463. No.—465. No.—466. I have not.—467. No.—468. No.—469. No.—471. No.—472. No.
 474. I found no difficulty at any of those ports I frequented.
 475. No.—476. No.—477. No.—478. No.
 481. I have in Cardigan Bay, off Machras Spit, and east end of the Causeway.
 482. Not of late years.
 483. I have not.—484. Never.—485. No.—486. Never have.—487. No.—488. Never.
 489. On the Shambles.
 490. No.—491. None.—492. No.—493. No.
 494. I have felt the want of buoys in the Bristol Channel at the back of North Sands.
 495. Never.—496. No.
 498. I have not.—499. No.
 500. Not to my knowledge.
 501. There is a beacon very much wanted on the Frenchman's Rock off Mulray and Lough Swilley.
 502. Yes; Yonghal, south coast of Ireland, and river Shannon.
 504. No, never.
 505. On the south side of Lune Deep buoys are wanted.
 506. A buoy on Helpsford Sand, south-west point of Walney Island, on the west coast of Lancashire, is very much required. I believe that Helpsford is within the limits of the St. George's Trinity Commissioners of Lancaster.
 507. Yes; a buoy is very much wanted on Helpsford, south end of Walney Island.

- | 15 | Question | 15 |
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| 508. On Hlpsford, Walney Island, a bell buoy wanted very much. | | 594. There is a beacon wanted on the Cannes Rock that lies about south-east of the Gribben Head, and covers at half flood; it is right in the track of vessels running from the south-west for Ferry harbour; there is also a buoy wanted on the Yaw Rock that lies off the Guineas, near Melvagizey. |
| 509. Yes, Portmadoc. | | 595. I have never felt a want of buoys or beacons on any part of the coast of the United Kingdom to the best of my knowledge. |
| 511. The Outer Dowsing, the north end of Sherringhan, and the north-east end of Sizewell Bank. | | 596. No.—597. Never.—598. Not for many years. |
| 512. No.—514. No.—515. No. | | 599. I have not.—600. No. |
| 516. Yes. I believe if the channel between the Kentish Knock and Long Sand were buoyed, likewise the channel between the Cross Sand and Scroby off Yarmouth, it would materially assist the navigation. I likewise think that a few extra buoys inside Goodwin would be very useful. | | 601. On the east coast of Ireland. If there were some large buoys on the south end and middle of Blackwater, north end and middle of Arklow, and two on the Coddling Bank. Bell buoys might be the best, but common buoys even would be very useful. The south end of Blackwater Bank is very steep-to; a large bell buoy would be very good there. |
| 517. Large bell buoy on One-fathom Bank, Bristol Channel, to replace one now on. | | 602. Milford Haven and Crown Rock, and Toes off Lenny Head near Milford Haven. |
| 518. One-fathom Bank in Bristol Channel, and Arklow Bank, coast of Ireland. | | 603. I have felt the want of buoys in the Channel between the Long Sand and Kentish Knock, entrance to the River Thames. |
| 519. At the present day none. | | 604. I have not.—605. No. |
| 521. Never; not at present. | | 606. Yes, particularly Beaumaris Bay. |
| 522. Between the Kentish Knock and the Long Sand. | | 607. Yes, on Selker Rock, south end of Hlpsford Bank (black), and on Foul Ground, Morecombe Bay (red), to mark entrance into Piel à Foudré; on north end of Bahama Bank, Isle of Man, would be very servicable. Blancy Channel, River Dee, should have at least two more buoys. |
| 524. Never.—525. No.—526. No.—527. I have not.—528. Not latterly.—529. No.—530. I have not.—531. Not latterly.—532. No.—534. No. | | 608. Yes, on Selker Rock; on Foul Ground, outside Walney Island; on north end of Bahama Bank; in Blancy Channel, River Dee. |
| 535. Hashorough and Shipwash sands, which are steep-to in many places. | | 609. Blancy Channel, River Dee, is a good channel, but not sufficiently buoyed. Buoys are wanted on Foul Ground and Hlpsford Bank, at the entrance of Piel à Foudré. |
| 536. Never. | | 610. On Selker Rock; on south end of Hlpsford Bank; and on the edge of Foul Ground, Morecombe Bay; on north end of Bahama Bank (Isle of Man), and on Craig Rock, Peel Bay. |
| 537. I felt the want of a buoy or beacon upon Sgeirtarsin, entrance to Sound of Raasa; (Catsgeir, back of Gigha Island, to rock near Port Appin (I have not the name of it); a buoy in Salen Bay, Sound of Mull; and another in Sound of Parba, near Broadford, Skye. | | 611. On Selker and Cockspeek Rock, south end of Hlpsford Bank; on north end of Bahama Bank, Isle of Man, in Blancy Channel, River Dee. |
| 539. No.—540. No. | | 612. On south end of Hlpsford Bank, Walney Island, there should be a black buoy, and a red buoy on the other hand going into Piel à Foudré; on north end of Bahama Bank; Welsh Channel should be better buoyed, and in Welshman's Gut (River Dee) there should be two buoys instead of one; another black buoy on Dutchman's Bank, abreast of Causeway buoy, Beaumaris River. |
| 541. I cannot say that I have particularly. | | 613. No. |
| 542. No; not on the coast of the United Kingdom. | | 614. Buoys are wanted to mark the Blancy Channel, Chester River; large ones should be used; also on Selker Rock, Cockspeek Seal, Hlpsford Bank, and on Seldom Seen, Piel à Foudré. |
| 543. Yes; several places in the Highlands; and on the coast of Zetland, in particular, I may mention the very dangerous half-tide rocks the Rimbles, in the fairway of Tellfound, Zetland, a passage much used by Greenland and other vessels, and in its present condition highly dangerous. | | 615. Yes, on the Selker Rock, coast of Cumberland, on the Foul Ground off Walney Island, and Duddon Sand. |
| 544. Want of a beacon on the Rundlestone Rock. | | 616. Buoys are wanted on Selker Rock; and on Hlpsford Bank, with Walney lighthouse bearing E. by N. $\frac{1}{2}$ N. |
| 545. No. | | 617. No. |
| 546. Yes; I think a buoy on the Rose Sand would be useful, on the Lincolnshire coast, off Saltfleet. | | 618. On Selker Rock, where two vessels were lost last year; about Walney, on the Cockspeek Rocks, and Hlpsford Bank. |
| 548. I have felt a want of a buoy on the Hlpsford Sand in taking Piel or Houbray with a scout north-easterly wind and ebb tide. | | 619. No. |
| 549. No.—550. Never.—552. No. | | 621. Answered in Question 14. |
| 553. Not these late years. | | 622. I have many times within the eight years I have been in command on the Newry trade been annoyed in thick weather for the want of a proper signal at Carlingford, say a gun fired from the lighthouse every 15 or 30 minutes. If there should be an objection to firing a gun from Carlingford light, there is the block house close to it; a gun of any size could be fired from it. [P.S.—Since filling this report, I find that four large buoys have been ordered for Carlingford Bay.] |
| 554. No.—555. No.—556. No. | | 623. The Rundlestone requires a beacon; Wolf Rock a light. |
| 557. The Shambles, on the Dorsetshire coast. | | 624. A light on the Land's End to guide clear of the Rundlestone, or the Longships made more powerful, would supply a considerable want. |
| 559. Outer Dowsing, and Procter Shoal of the Humber. | | 625. No.—627. No.—628. None.—629. I have never. |
| 560. Cannot say. | | 630. As far as my experience goes, I have not. |
| 561. Sounds of Islay, Jura, Mull, and Skye, and several lochs on the west coast of Scotland, enumerated in No. 23. | | 631. No. |
| 562. No.—563. No. | | 632. Aldborough Knaps should have as large a buoy as possible. |
| 565. I have felt much the want of buoys on the south side of the Skerries, Start Point, and also two buoys are much wanted on the Shambles, Bill of Pentland, and lightship on the east end. This would be of the greatest benefit; also a buoy is wanted on the shoalest part of the West Hendon in the passage to Antwerp from the Downs. The buoy ought to be on the south-west part of Hendon. | | |
| 567. No.—568. Never.—569. No.—570. No. | | |
| 571. Not where I have been navigating. | | |
| 572. Constantly; almost everywhere on the north and west coasts. | | |
| 573. No; I consider the channels I have navigated to be well buoyed. | | |
| 574. Never.—575. No. | | |
| 576. On the Frenchman's Rock, north-west coast, Ireland; the Highland Rock, north-north-east from the Maidens; and a buoy on the Whitestone Bank, Isle of Man. | | |
| 577. None.—578. No. | | |
| 579. Yes, Hendon Rock. (See Appendix to Mariners' Evidence, p. 579.) | | |
| 581. I think the coast is well supplied with buoys and beacons. | | |
| 583. Not sufficiently close to ascertain. | | |
| 585. I have often felt the want of a buoy on the south rock off Tuskar. | | |
| 589. No. | | |
| 590. Yes; on the plate bone off the Amph Rock, entrance of Small Russell, coast of Guernsey. | | |
| 591. No. | | |
| 593. Yes, I would propose a large nun buoy on the dangerous shoal off Rattray Head in six fathom water. | | |

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633. I have not.—634. No.—636. I have not.—637. Never.
639. I think the Humber may be improved both in buoys and lights. The Killingholme leading lights are too distant; a float somewhere outside the beacon would be useful; and several more buoys might be useful.
640. No.
641. On the Rundlestone, Shambles, Skerries, in Start Bay, Lizard Point, and outside the Stags.
642. No.
643. There was a want in the service formerly, but perhaps not now.
644. No.—645. No, not on the coast I am acquainted with.—646. No.—647. No.—648. No.—649. No.—650. No.
651. Buoys are wanted on the Skerries near Start Bay, the Shambles near Portland, and doubtless on Hand Deep and East Rutt here, if we are to have many ships in the channel fleet drawing 26 and 27 feet water.
652. No.
653. On the Shambles (Portland).
654. Never.
656. Yes; on the Manacles and Rundlestone.
657. Never.—658. No.—660. No.—666. Never.—667. No.—668. No.—671. I have not.
672. Yes, in the harbours of Milford Haven and Waterford a beacon is wanted on the Brandies Rocks eastward of Satee Islands.
673. Harbour of Milford Haven. The buoys in Milford Haven are, I am led to believe, Admiralty buoys.
674. No.—675. No.—676. No.
677. I have seen the want of a good substantial stone beacon on the Wishlan Rock in Portinllain Bay, Carnarvonshire.
678. I have felt the want of beacons on the coasts of the United Kingdom in thick weather, when at times you may get sight of a headland for a few moments, but possibly not sufficiently clear to distinguish the part of the coast you are on; whereas, if a beacon could be seen it would at once point out the ship's position.
679. No.—680. No.—683. No.
685. None on those I am in the habit of visiting.
686. A dangerous sunken rock one third of a mile off entrance Barra harbour, Hebrides.
687. No.—688. No.—689. No.—690. No.—691. No.—692. No.
693. On the Shambles near the Isle of Portland.
694. No.—695. No.—696. None.—697. No.—698. No.—699. No.
700. I have not.—701. No.—702. None.
703. I think a lightness should be placed on the east end of the Shambles.
704. No.—705. No.—706. No.—707. No.
708. Outer Dowsing, Sherringham Shoal to small Hasborough Sand, Winterton Ridge, Aldborough Knaps to small Shipwash Sand.
709. Buoy on Highland Rock on east coast of Ireland.
713. At Dublin.
714. A black pillar buoy with staff and ball off the north and south rock lighthouse, in room of the small red buoy there at present, north-east coast of Ireland.
715. I have often felt a great want of buoys in the River Shannon, Derry Loch, and Loch Ryan. I also think a great part of the buoys in the Channels into Liverpool much too small.
716. At Liverpool and Dublin.
717. Not since a bell beacon was placed on Spencey Spit in July 1858 in Rock Channel entrance, on the turn into Rock Channel, Liverpool.
718. The one upon the Dutchman's Bank, Menai Straits, has been adrift several times the last few years; should think a larger one and better moored requisite.
719. No.—720. No.—721. No, not of late years.
723. Not since a bell beacon was placed on Spencey Spit at my suggestion in July 1858, in Liverpool Channel.
725. The buoy placed on the "flowing eddy" opposite the high light on Gromsby has often broke adrift, and is now placed on the wrong spot, it is said.
727. The buoy on the Rundlestone is not a very pernicious object.
728. No.—729. No.
730. I do not remember just now of finding a want of buoys in any particular parts, but have thought that some buoys would have been of more service if they had been placed in different positions. Buoys not in sight of land should be of the most conspicuous kind.
731. No.
732. Yes; off the Thorn and Solent.
733. No.
737. Blaney Channel, River Dee, should be better buoyed. An additional buoy north of West Hoyle is wanted. Selker Rock, Coekspeck Scar, Hillsford Bank (a large buoy) should be buoyed. Also on the north end of Bahama Bank, and on Craig Rock, Isle of Man.
738. I have frequently found it very difficult to make out the buoy on Alborough Knaps.
739. North Sea, Outer Dowsing, Hammond's Knoll, Winterton Ridge, Sizewell, and Inner Gabbard.
740. I have not.
741. Winterton Ridge, Hammond's Knoll, there is no buoy.
742. Outer Dowsing, Hammond's Knoll, Winterton Ridge, and larger buoys on Sizewell or Inner Gabbard.
745. No.—746. No.—748. No.
749. In former years in the Channel Islands, but now remedied.
752. Never.—754. I have not.—755. No.—756. None.—758. No.
759. On the Shambles of Portland, and the Skerries, near the Start.
760. I have frequently in the River Shannon, where there is neither buoy-beacons or perch.
761. Very much in the eastern entrance to Foynes Harbour. See No. 23.
762. No; for reasons given at Question 1.
763. No.—764. No.
765. Yes; on Selker Rock; on Hillsford Bank and Foul Ground, Walney Island; on north end Bahama Bank, on Craig Rock; in Blaney Channel, River Dee.
768. I would recommend that a beacon be placed on the Dean, tail buoy as a guide for ships coming from sea for Spithead, and forming a connecting link with Bullock's Patch and Boulden Bank.
769. Between Nash Point and west end Nash Sands, where a lightship is wanted. The buoys ought to be all black, with white tops, and numbered N. Sands, and marked.
771. I do not remember ever having felt the want of buoys or beacons.
772. No.
773. Not of late years.
774. Outer Dowsing, Winterton Ridge, Hammond's Knoll, and a larger buoy on Sizewell and Inner Gabbard.
775. I have, with north and north-east winds, felt the want of a buoy about one mile east by S. $\frac{1}{2}$ S. from No. 2 (Goa Buoy (River Tay)).
776. Frequently, on places named in Answer to Question 13.
777. I have never felt any want of either.
778. Cromer Ridge.
780. At Lochindahl, Island of Islay.
781. On the Varne.
782. A beacon on the Highland Rock (Maidens). In Lough Carlingford there is almost a total absence of buoys and beacons, a want the local authorities are now supplying.
783. Yes; on south end of Hillsford Bank, and on Foulney Spit, Walney Island. On north end of Bahama Bank, Isle of Man.
784. No.
785. I have not.
786. A buoy on the north side of the Goa Sand, River Tay, at a snatchway often used by us with northerly winds.
789. Yes, on the coast of Ireland.
791. I have never felt the want.
792. I have never felt the want.
793. I have not felt the want.

16. Are you aware of the existence of difficulty in navigating any particular Channels, Harbours, &c., owing to the system of Buoying there used, or the absence of system?—if so, name them, and the defect in each case.

1. I am not aware of any.—2. No.—3. No; I am not.—4. None.—5. No difficulty, that I am aware of, in navigating any channel with the present system of buoying.—6. No.
7. There has been no general system up to a very recent period, and there has been much confusion consequent upon it. Channels should be marked by black buoys on one side and red on the other, with chequered

- black and white buoys for middle grounds. This latter distinction has generally been recognized among seamen, but unfortunately this was overlooked in the case of the Tees. The Spit of the South Cave was (and perhaps now is) marked by a chequered black and white buoy; and, if I am correctly informed, it caused the loss of a vessel and all hands, from mistaking it for a middle ground buoy.
8. I would propose a uniformity of buoying; that is, that we should always pass the same coloured buoy to starboard and port, when entering a harbour, and vice versa when leaving.
10. Only from the want of uniformity of system for all places.
12. No general system appears to be established for the colours of buoys, and hence great difficulty arises to every stranger on approaching a port, from not knowing whether the buoy he sees should be left on the starboard or port hand.
13. There is necessarily much difficulty in navigating all such places as are either totally destitute, or very inadequately supplied with artificial aids. It is the absence of all system that I have to complain of. No one attends to the wants of this coast, or seems to care about it.
14. None.—17. None.
18. No. Every channel, where buoyed, should be red and black, and on one and the same system.
20. None.—21. No.—22. No.—23. No.—24. None whatever.—25. No.
26. I do not know of any difficulty in navigating the channels and harbours in my district.
27. No.—28. No.—29. No.—31. No.—32. None.—33. No.—34. Not any.—35. No.
36. The Black Deep is not buoyed off, which would be of great service in case of vessels parting from their anchors while riding in the Nab Channel
37. No.—38. No.
39. Yes; the buoys in Southampton water, I consider, are too small, and indistinct in colour.
40. I know of no difficulty in navigating any of our channels or harbours, owing to the system of buoying.
41. No.—42. No.—41. No.—46. None.—47. No.—48. None.—49. None.—50. I am not aware of any.—51. No.—52. No.—53. No.—55. I do not know of any.
56. Noman Buoy difficult to be seen, owing to the rippling of the tide.
57. No.—58. No.—59. No.—60. No.
61. I cannot speak to special instances personally.
62. No.—63. I am not aware of any.—64. I am not.—65. No.
66. I know of no difficulty in navigating any of our channels or harbours, owing to the system of buoying.
67. No.—68. No.—69. No.
70. I know of no difficulty in navigating any of our channels or harbours, owing to the system of buoying.
71. No.—72. No.—73. I know of none.—74. No.—75. No.—76. No.—77. No.—78. No.—79. None.—81. No.
82. Black with staff, I think the Noman Land Buoy to be.
84. I do not.—85. I am not.—86. I do not.—87. No.—90. No.
91. There must be doubt and hesitation, with danger, when navigating a coast where every other port has a different system, as is generally the case in England and Ireland, and was so in Scotland until lately. A steamer from Liverpool, bound to coasts on the north-east coast of Ireland, might in 24 hours encounter half a dozen alternate arrangements in colour.
92. Aware of no difficulty.—94. I am aware of no difficulty.
97. I am not.—99. No.—100. No.—101. No.—102. No.—103. No.—104. No.—106. No.—107. No.—108. No.—110. No.—111. No.—113. No.—114. I am not aware of any.—115. No.—118. No.—119. No.—120. I am not.—121. No.—122. I do not know any want.—123. I am not.—124. No.—125. No.—126. No.—127. I am not aware of any.—128. None.
129. The light in Pakefield Gat would be more likely to prevent error if moored more to the southward, the channel having altered.
130. No.—132. No.
134. No; but I am afraid, if the present system should be altered, it would be a dangerous experiment, being a well-organized system, and understood.
135. No.
136. The Sunk and Ferry Buoys, in Lynn Well, much need improvement.
138. No.
139. Difficulty would be much lessened by buoys, situate at the entrance of any channel, being of different colours, say black on one side, white or red on the other.
140. Nil.—141. No.—142. No.—143. No.—144. No.—145. I am not.—147. None.
148. I am not aware of any difficulty in navigating any channel, arising from the system of buoys at present in use.
149. Not aware of any difficulty.
150. I am not aware of any at this present time as in former years, not so frequently navigating the various coasts and harbours as usual.
152. No.—156. No.—157. No.—158. No.—160. I am not.—161. Not aware.—162. No.
165. I am not aware of any particular difficulty in navigating any channel, or the want of buoys, or the system of buoying.
167. None.—170. No.—172. No.—174. No.—175. I am not.—177. No.
180. So far as my experience goes I am not aware of any.
181. No.—183. No.—186. I am not.—189. No.—191. No.—193. No.—195. No.
196. Belfast, in foggy weather, for want of self-acting bell on the lighthouse, Liverpool Horse channel buoys being too small in bad weather.
198. No.—199. None, as far as I know.—201. No.
202. No; but where the channel is narrow I think there ought to exist beacons on one side, with buoys of one colour on the other, and a buoy of a different colour to mark the fairway.
203. No.—204. No.—206. No.—207. None.—208. None.—211. No.—212. No.—213. No.—215. No.—216. No.—217. Not aware of any.
218. I am not aware of any difficulty to navigate any port or ports on our coast.
220. No.—221. No.—222. No.—224. No.—226. No.—227. No.
228. This is a large question. There is room for improvement, as a general plan or principle. I always considered the buoys on the sea heads, Scroby and Corton, bad; the flood tide acts on these sands. They need larger and darker buoys.
229. No.—230. No.—231. No.
234. I am not aware of any, except fairway buoys; they should be distinguished with a bell, or something similar, especially at the entrance of harbours and narrow channels, to prevent mistakes in entering at night time.
242. No.—244. None.—246. No.—247. No.—249. No.—250. No. I am not aware.
251. In boisterous weather (with a few exceptions) all the British coasts are difficult in navigating, but particularly the St. George's Channel; not owing to any absence of system in the question, but to the absence of a system of channel pilots in force, which would avoid many accidents. In regard to the port of Liverpool, there is no pilotage in force for vessels bound inwards beyond Point Linas, nor for those bound out, west of the N.W. lightship. But in many instances they would be welcome to go or come from, as far as the Tusker, as it is from Bristol to Lundy.
252. No.—253. Not aware of any.—256. No.
257. There are no buoys in the Shannon.
259. No.—261. Not aware of any difficulty for the want of buoying.—262. I am not aware.—263. None.—264. None.—266. No.
267. In the River Severn, between Kingroad and Sharpness, there are no buoys or beacons of any kind. If two beacons were placed on the land to lead vessels through the Shoots, and two or three buoys or beacons placed upon the rocks, on the south side of the Barnicle Channel, would be of the greatest service possible for the increasing trade to Gloucester.
270. No.
271. Wants a buoy or perch on the east side of Block House entrance of Carlingford Lough.
272. None.
273. Romsy Sound, off St. David's, Pembrokeshire, is much frequented by coasting vessels, and there is a rock in the middle of the Sound called the "Horse," very dangerous; many vessels lost on it; the sharp top of it dry, about three feet, at low spring tides. It could be blown up.
275. No.—276. No.
277. I am not aware of any difficulty.
278. Think the buoys should be put uniform in all channels; viz., red, on the port hand, going in.

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279. No.—280. I am not aware of any such.—281. None.
 283. I am not aware of any.—284. No.
 285. I have felt a want of system in Yarmouth Road and channels, and in mouths of the Thames; perhaps now supplied.
 286. I am not aware.
 287. Buoy should be uniform for entering all harbours.
 288. I am not.—289. No.
 291. I have experienced great difficulty in navigating the River Shannon, in consequence of the total absence of buoys and beacons upon the rocks and shoals along the margins of the channel in that river.
 292. I am not aware of the existence of any difficulty in navigating any channel or harbour, owing to the present system of buoying.
 297. No difficulty experienced.
 300. No.—301. No.
 302. Not aware of any; could take a ship into any harbour in the kingdom without a pilot.
 303. I am not.—306. No.—307. None.
 308. I am not aware of any difficulty in any channel or harbour I have been through, or at.
 309. Not aware of any.—310. I am not aware of any.—311. No.—312. No.—313. No.—315. I know of none.—316. Not aware of any existing difficulty.—317. None.—318. I am not.
 320. A vessel may deviate from the channel going into Weymouth Harbour, and ground upon a lot of large stones on the south side, and do her a serious injury. They can easily be removed.
 321. No.—322. No.—323. No.—324. No.—325. No difficulty.—326. No.—327. I am not.—328. Not aware of any.—329. I am not aware of any difficulty.
 330. All harbours should have the same shape and colour of buoys; say starboard side, on entering, red; port side, black.
 331. No.—332. No.—334. No.—335. No.—336. No.—339. No.—340. I am not.—342. No.—343. No.—346. None.—
 347. Yes. In the harbour of Waterford the buoys are far too small, and a light should be placed on the Spit at passage.
 349. I have not been in and out of enough harbours in the United Kingdom to give a positive answer.
 305. I am not.—351. I am not.—352. No.—353. None.—354. No.—355. No.—356. No.—358. I am not.
 359. None, except the approaches to this harbour, where more buoys and beacons are much needed.
 360. Not aware of any.—361. None.—363. No.
 365. I think the mouth of Bristol river very much in want of beacons, there being at present only the banks to guide, which are often overflowed in a high tide, or heavy gales in winter.
 366. I think a national system ought to have one colour on starboard, and another on larboard, and fairway buoys chequered, so that strangers could take any harbour or channel.
 370. No.—371. I am not.—372. No.—374. I am not aware of any.
 375. The entire Shannon, Youghal Bar, Dungarvon Bay.
 377. No.—381. None.—383. No.
 384. If I recollect rightly, there are two rocks in the west entrance of Berelserven not buoyed. The Doolah, off the Galley Head, is a bad rock at high springs.
 386. No.—387. No.
 388. I wrote, in 1847, to the Commission of N. Lighthouses, recommending a masked lighthouse, of oblong form, for the harbour of Stormoway, in Hebrides.
 390. No.
 391. From Bell Buoy in Rock Channel to Rock Lighthouse there is no leading light at night, only the single rock light. With north wind and heavy sea, ships are hove to leeward without notice.
 393. The buoys on Mixon Sand, near Mumbles Head, and Manacles, in my opinion, ought to be good bell beacons, the one on Mixon being a very poor one.
 394. The Helbre Swash. The buoys are too small, and the leading not correct, nor large enough.
 395. None.—396. No.—397. No.—398. None.—399. No.
 400. In the River Shannon great inconvenience is felt, for want of buoys and beacons upon the shoals and rocks. I am not aware of any deficiency elsewhere.
 401. No, except that some buoys are not large enough, in various places, and others are ill-painted.
 402. None.—404. No.—405. No.—406. No.—407. No.—410. No.—411. No.—413. No.—414. None.—416. No.—417. I am not.—418. No.—420. No.—424. I am not.
 425. No.—427. No.—429. No.—431. No.—432. No.—433. No.—434. No.—436. I am not.—437. No.—438. No.—440. No.—441. No.—442. I am not aware.
 443. No.—444. No.—445. No.—446. No.—447. No.
 448. An uniformity of buoys in all harbours, black on port hand, and red on starboard hand, inward bound.
 449. None.—450. No.—451. No.—452. No.—454. No.—456. Not aware.—457. No.—458. No.—459. No.—461. None.—463. No.—465. No.—466. No.—467. No.—468. No.—469. No.—470. No.—471. No.—472. No.
 474. I am not aware of any deficiency of buoys, and do not disapprove of the present system I have found at different places.
 475. Yes. I think there should be but one system of buoying. Red on port hand, black on starboard, going into port; green for wrecks, and striped for fairways.
 476. No.—478. No.—480. No.—481. I am not aware of any.—482. I am not aware of any.—483. I am not.—484. No.—485. No.—486. I am not.—487. No.—488. Not aware.—489. I am not.—490. Not aware of any difficulty.—491. I am not aware of any.—492. No.—493. No.
 494. I think the channels I am acquainted with well buoyed.
 495. I am not aware of the existence of any difficulty in performing the duty named.
 496. No.—498. I am not.—499. No.—500. I do not.—501. No.
 502. Yes; Youghal, south coast of Ireland, and River Shannon.
 504. No.—505. Nil.
 507. Would make it compulsory on all to adopt the Trinity system.
 509. No.
 511. Yes. The Outer Dowsing, the north end of Sherringham, and the north-east end of Sizewell Bank.
 512. No.
 513. Leith Harbour. A signal at night should be made, when vessels are leaving the harbour, to prevent collisions by other vessels coming in whilst the fairway is not clear. Also a small light on the extremity of the east pier, invisible from the eastward.
 514. Bristol Channel, Lundy being often invisible. A lighthouse at Morle would be valuable.
 515. No.
 516. The buoys at the entrances of the channels off Yarmouth Sands and off Lowestoft, in my opinion are too small, as vessels running for them in gales of wind it is mostly broken water, and are oftentimes not seen until too late. I should recommend these buoys at entrances of the channels, likewise those at the back of Corton Sand, to be the same as those at the back of the Goodwin.
 517. No.—518. No.—519. Not aware of any.
 521. I would recommend a bell buoy at the south entrance of Illewett's Channel, on the port side going to the southward, as a great assistance to ships running for Yarmouth roads in foggy weather.
 522. I think that if the channel between the Kentish Knock and the Long Sand were buoyed off it would be of great utility in stormy weather.
 524. I am not aware.
 525. I think that if the channel between the Kentish Knock and the Long Sand were buoyed off it would be of great utility.
 526. No.—527. I am not aware of any.—528. Not.—529. No.—530. I am not aware.—531. No.—532. No.—533. No.—534. No.—536. I am not.
 537. I have no case to specify.
 539. No.—540. No.—541. I am not aware of any.—542. I am not aware of any difficulty.—544. No.—545. I am not.
 546. Yes. In all narrow channels I would number the buoys on each side, so as in thick weather you would know the buoy, and where you were, &c.
 548. No.—549. No.—552. No.—553. Not to my knowledge.—554. No.—555. No.—556. No.
 557. The harbour of Salcombe is not buoyed, although it is mentioned in direction books as being buoyed. The absence of buoys makes the entrance to the harbour difficult.
 558. There should be one system of buoying channels into harbours and between sands; for instance, the colours of the buoys at Portsmouth and Exmouth are diametrically opposite, and Salcombe is different from both.
 559. No.
 560. There appears to be no general system of buoying out of England. In the River Hooghly, on entering, you leave the red buoys on the port, and black on the starboard hand. In the Ganks, Keang, China, the reverse

- is the case. Alexandria Harbour has a white beacon, then a red, and afterwards a black buoy, on the edge of the sand, on the port hand.
562. No.—564. No.—565. I have not.
567. I think if a system was adopted at all bar harbours to hoist a flag, to be seen at a distance, when the channel shifts from one side to the other, would be useful.
568. No.—569. No.—570. No.—571. Not to my knowledge.—573. No.—574. No.—575. No.
577. Not sufficient in channel practice.
578. No.
579. No. I think the system of buoying, in all channels and harbours with which I am acquainted, is perfect, or nearly so. (See *Appendix to Mariners' Evidence*, p. 579.)
581. I am not aware of any.—589. No.
590. Yes. The fairway buoys, at the entrance of the Pakefield and Stanford Channels, are not sufficiently conspicuous to be seen in bad weather, when running for those channels.
591. No.
593. Once, but not more.
595. I am not aware of the existence of difficulty in navigating any particular channels or harbours owing to the system of buoying.
596. I do not know of any.—597. Not any.—598. Not aware of any.—599. I am not.—600. No.—602. None.
603. There is great difficulty in navigating the Stanford Channel, off Lowestoft, owing to the buoys not being shifted as the sand increases.
604. I am not aware.—605. No.
606. Yes, off the town of Beamaris, owing to vessels being moored in mid channel and the narrowest part of it; other buoys also wanted.
607. No.
608. There is a difficulty in navigating Blaney or Welsh Channel, River Dee, from the absence of system and the want of buoys. I would remark here that the Trinity buoys along the coast are often moved and changed without notice being given to pilots, of Liverpool at least.
609. No.—610. No.—611. No.—612. No.—613. No.—614. No.—615. No.—616. No.—617. No.—618. No.—619. No.—621. No.
622. There are many dangerous rocks and shoals in Carlingford Bay not in any way marked.
625. No.—627. No.—628. None.
629. There are several channels might be made by buoying on the east coast a good roadstead.
630. In navigating all channels the fairway buoy should be black with a ball on the top placed with water on each side.
631. No.
632. Nothing more than I have named.
633. I am not aware.—634. No.—636. I do not.—637. No.
639. I like the system in the Elbe:—Black starboard, white port, going in.
640. No.—642. No.—643. No.—644. No.
645. I am not aware; at present I have not experienced any difficulty.
646. No.—647. No.—648. No.—650. No.
651. My knowledge in 1859 not very extensive as regards this question. A beacon, however, on the Shagstone in the eastern channel to Plymouth Sound is required.
652. No.
653. The entrance of the River Demerara is not sufficiently buoyed, and the pilot system badly organized, that many ships are often allowed to remain on the bar and lee bank for days, and frequently from the taking off of spring tides fill the following springs.
654. None.—656. No.
657. To coasters and such people who are in the constant practice of navigating our coast, channels, and harbours no difficulty would exist, but to others the numerous colours, &c. of the buoys would be extremely perplexing.
658. No.
660. The masters of the steam vessels trading to this port (Milford Haven), express a wish to have a buoy on the shoal east of the Stack Rock, and another on the north side of the Pwllchrowen Flats, black on one side, and red on the other, and I think it would be very beneficial.
666. I am not aware of any difficulty.—667. No.—668. I am not aware.
671. On the English coast I think the harbours generally well buoyed with some few exceptions, such as at Milford Haven, as before named.
672. Milford Haven: Lewis Rock should have a large nun buoy, black; Harbour Rock, black; Pwllchrowen Flats, black buoys; Heavspit, large red can buoy; outer buoy of Canspit (now white) should be black, but better if a lightship, as formerly. Waterford: The buoys up to Passage are far too small, there should be a light also upon the spit at Passage, now a very paltry beacon.
673. Milford Haven: Lewis Rock buoy, large nun buoy; harbours, do. nun and black; Pwllchrowen Flats, a black nun buoy; Ware spit buoy, red can; Carrs Rock spit, now white, should be a large black nun buoy, better if a lightship, as formerly.
674. No.—675. No.—676. No.—678. No.—679. No.—680. No.—683. No.—685. Ditto.
686. I should recommend a bell buoy on Breaksea Point, Bristol Channel, also a floating fixed (two lights, one above another,) on the Blackwater Bank, north end, St. George's Channel.
687. No.—688. I am not aware.—689. No.—690. No.—691. No.—692. No.—693. No.—694. No.—695. No.
696. If a uniform system with the buoys were adopted, I think it would be beneficial, say, all buoys, black, to be left on starboard hand, and white on port side; all shoals to be chequered.
697. No.—698. No.—699. No.—700. I am not aware.—701. No.—702. None.—703. I am not aware of any difficulty.—704. No.
705. Flat topis a bad shape, white is a bad colour.
706. Not aware.—707. No.—709. I am not aware of any.
715. I have felt a want of buoys in the River Shannon, Derry Loch, and Lock Ryan.
717. No observation.
718. No, except the before named.
719. No.—720. No.—722. Not any.
723. No observation.
725. There is often difficulty in vessels entering Stromness Harbour owing to a shallow point running out in a westerly direction from the Outer Holme of Stromness.
728. I am not.—729. No.
730. I am not aware at present of any difficulty in navigating any channels, but when at sea have thought that some might be made more safe and easy to pass through by a more uniform system of colours and shapes of buoys on particular sides.
732. No.—733. No.
737. All the ports along this coast are buoyed on a good and uniform system.
738. No.—740. I am not.—741. No.
743. There are many shoal places unbuoyed, and not perched, not having commerce or being much frequented.
744. No; in none that I am conversant with.
745. I am not aware of any difficulty owing to the present system.—746. No.
750. The buoys are generally too small, and there is a want of uniformity in the system of buoying.
752. No.
754. I am not aware of any, but have no experience in harbours, always having employed local pilots.
755. No.—756. None.
758. There is a want of one uniform system of buoying in most of our small harbours.
759. At the Needles passage it requires a better bell and beacon buoy, in the outer part of Shingles, than is now used.
760. I know of none but the colour of buoys. Where the most danger is, in my opinion, the black buoys should be placed, as best seen at night.
762. No; for reasons given in answer to Question 1.
763. No.—764. No.—765. No.—771. Not aware of any.—772. No.—773. No.
775. The Gaa Channel (River Tay), is not an authorized channel, but there is plenty of water in it, and it is often used with north and north-east winds; indeed, it is often impossible, when it is flood tide, and the wind northerly, to get into the river without using it.
777. I am not aware of any.—778. No.—779. No.
780. In Lochindrych, Islay, there are no buoys or beacons, which are very much required to guide vessels to the proper anchorage, and from the want of which I have (during my long period of service) known many vessels to run on the bar, and remain there until the discharge of their cargo.
783. No.—784. No.—785. I am not.
787. Outside Dorinch Island, Clew Bay, there is a rock with only seven feet water on it; it bears W. by S. $\frac{3}{4}$ mile distance from Inisgort light. A buoy would be requisite.
789. See copy of Remark Book herewith sent.

17

Question

17

17. What is the shape and colour of the Buys which you can see best at night?

1. The spiral buoys are best seen of a dark colour.—2. Black spiral buoys.—3. Black nun buoys.—4. Black nun buoys, with a staff and globe.—5. Large nun buoys, of black or red colour.—6. Black spiral buoys.—7. Can-shaped, and black or red, as the case may be. The reds should have a ball of white on the tops, to distinguish them from the blacks.—8. Can buoys, chequered.—9. White or striped. Can buoys, with cage beacon on top.—10. Red or black is best seen at night, and the flat top for shape.—11. Red or black.—12. Can buoys, white and red.—13. Generally black. The shape, that which floats high, is easily lifted by the undulations, and rises well above the surface.—14. Black.—15. Black.—16. Conical, black.—17. Can buoys, black.—18. Same as above, as this shape stands lofty. Red in many places is mostly to be preferred, but that depends upon the state of the weather. I am of opinion that something could be done to coat buoys with, to make them visible at night, although very dark.—19. Black.—20. Black.—21. Black nun buoy, with staff and globe.—22. Black.—23. Black.—24. Black.—25. Black.—26. I consider that spiral or monster buoys, painted black.—27. Black.—28. Black.—29. Black.—30. Black.—31. Can shape, and black.—32. Black.—33. Black.—34. Black nun buoys.—35. Nun, dark colours.—36. Black.—37. Conical, black.—38. In my opinion, red.—39. Shape, like those on the Shingles, but larger. Colours, black, striped, or chequered; white I consider objectionable.—40. A large nun buoy. Black is best to see at night.—41. The buoys in the Tay, and the fairway buoys, have the best shape of any I have seen. The colour in the dark is immaterial.—42. Black.—43. Dark coloured.—44. Black and red.—45. Black spiral buoys, with ball and staff.—46. Black.—47. Black spiral buoys.—48. At night I presume you cannot distinguish any colour; but, in a fine moonlight night, I prefer a black buoy.—49. Black.—50. The spiral buoys, and those coloured black or dark colours.—51. Conical, and coloured black.—52. A large half nun, painted black.—53. Black.—54. A long nun buoy; black.—55. Black.—56. Black can buoy, with a beacon.—57. A large half-nun, painted black.—58. Black.—59. The elongated or nun buoy; it can be seen above the horizon.—60. Black.—61. I prefer the usual form of our buoy, but most decidedly object to white buoys.—62. Shaped thus, standing as nearly perpendicular as possible, and painted black.—63. The spiral buoys are best seen, and those coloured black.—64. Can buoys, and black, decidedly.—65. A large half-nun buoy, painted black.—66. A large nun; black or dark red is best to be seen at night.—67. Black and red can buoys.—68. Black or red nun buoys.—69. Black or red can buoys.—70. A large nun; black is best to be seen at night.—71. Black.—72. Cone, and black.—73. Black.—74. Black.—75. Black nun buoys.—76. The black.—77. Peacock's patent; colour, black.—78. Can buoys, of a dark colour.—79. Black.—80. Nun buoys; black.—81. Not prepared to give a decided opinion.—82. Black.—83. Black.—84. Can buoy, colour black.—85. Black, with beacons.—86. Can buoy, colour, black.—87. Black or red.—88. Black.—89. In the Irish Channel, where the water is so clear, black and red show best; but, where the water is not so clear, white is best seen. I believe, in all weathers.—90. Black or red.—91. This will depend on various circumstances. In order to meet the objections of those who prefer white to the red buoy of the proposed system of uniformity, under the supposition of its being better seen at night, I would suggest a lighter shade of the latter colour, to that usually adopted.—92. Black buoy, with beacon.—93. Black can buoy.—94. A can buoy, thus; black or red.—95. Black.—96. Black.—97. Black nun buoys.—98. Black or brown.—99. Conical, and black.—100. Black.

102. Large nun buoy; black.—103. Black nun buoys.—104. I think that buoys are of no practical use at night.—106. Black, with beacon.—107. The largest size; conical; painted red, with white rims round them.—108. Nun buoys, white.—109. Nun buoys, red or black.—110. I should think white, but do hardly recollect.—111. The long spiral black buoys show best at night.—112. Black or red.—113. The large nun buoy, and red a good colour.—114. I should think black, the shape immaterial.—115. Black buoy, and shape of those used at the entrance of the River Mersey.—116. Black, with the top shape.—117. Black.—118. Black nun buoy.—119. Black, staff and ball.—120. Round buoys, with a flat head, of a black colour.

—121. Black can buoy.—122. The buoys which stand over end, and painted black, such as the buoys of the Tay.—123. Round buoys, with a flat head, of a black colour.—124. Black nun beacon buoy.—125. Black, round.—126. Black.—127. The spiral buoys are best seen, and those coloured black.—128. Can or nun shape; colour, black.—129. Long egg-shaped buoys are best seen.—130. Cask shape, and black.—131. Dark-coloured.—132. Black or red; nun, the best shape.—133. Black, with beacons, as S. West Brake.—134. I can always discover black the best in night-time.—135. Black.—136. Black beacon buoys.—137. Spiral buoys, black, such as are used in the Humber.—138. Conical, and black.—139. Oval top buoy, black colour.—140. Black beacon buoys.—141. Conical, and black.—142. Black.—143. Black or red; flat top.—144. The colour most easily seen at night depend upon the nature and amount of light; if moonlight, white; if starlight, red or black.—145. I cannot say.—147. Black.—148. Dark colour.—149. White.—150. Black nun buoys, particularly those with ball.—152. Black, round.—156. Large on the top; dark.—157. White and black, streaked.—158. Black nun buoys, with beacons.—161. Sugar-loaf; black.—162. Black, as at moonlight, no white buoy can be seen at any distance.—163. Black.—165. Black; nun.—166. Black.—167. Black, but shape immaterial, if large enough.—168. Black nun buoy.—170. Nun buoy, white and red.—172. I am not aware.—173. Can buoys.—174. Large black nun buoys, with staff and ball.—175. I do not know.—177. Black.—178. Red nun buoy.—179. Black, conical.—180. That depends in a measure on the colour of the water; if white water, I believe the colour should be black, and vice versa. In regard to shape, I am not prepared to answer.—181. Nun, black and white, with long staff.—184. Black and round.—186. Black, cone.—189. Black, with nun buoy.—191. White, round and square.—193. Black.—194. Oblong, and black.—195. I should say, black nun buoys.—196. Can buoys, red; nun buoys, black.—198. Black.—199. The larger the better for seeing, and I think black is the best.—200. Red.

201. Black monster buoys.—202. A conical buoy, white below, with a black top.—203. Without reference to shape, black.—204. Long spiral buoy, painted black.—205. Black cone buoy.—207. Black.—208. Black cone buoy.—209. Cone, black.—211. Black nun beacon buoys.—212. Buoy of spiral shape, coloured black.—213.

214. Black cone buoy.—215. Nun buoys, black.—216. Shape of nun buoy; black.—217. Black, or any dark colour. I prefer the cone shape.—218. The tub-shaped buoys, I think, are best; and black buoys are best seen, day or night.—219. You can see large nun buoy (black) further than any other colour, by night or day—much further distance.—220. Red nun buoys.—221. Black.—222. Conical, with point upwards; black.—224. Black.—225. Black.—226. Black nun buoys.—227. Large conical buoys, either red or black.—228. Large nun buoys, black.—229. It is difficult to answer this, because, in my opinion, a great deal depends upon whether it is a light or dark night.—230. Upright bell buoys are very useful, especially in fogs. I think white buoys most easily seen at night.—231. Black nun buoys.—232. You may see a black nun buoy a much greater distance than any other colour, by day or night.—233. Black nun.—234. Nun buoys are best in my opinion; white at the surface, and black top.—235. Black nun buoys, a good size, such as S.W. Shipwash, &c.—236. Black, conical shape.—237. The lead and a good look-out.—238. Black or red.—239. I think, black.—240. Red.—241. I think, red.—242. Black.—243. Conical, black.—244. Black, surmounted with staff and ball, cross or triangle.—245. Black and large, which is generally too small.—246. White in some cases, and dark in others.—247. I see no difference.—248. Black nun buoys.—249. Black.—250. Nun buoys, black, are the best to see at night.—251. The shape is that which will preserve its equilibrium the highest above the water. The colour is doubtless the most black.—252. Black in colour, and shape as on Dun-gee Bar.—253. Those in common use answer the purpose very well.—254. Black.—255. Black.—256. White can.—257. Conical, painted black.—258. Can buoy, black.—259. Beacon buoys are best.—260. Black.—261. Black bell shape.—262. I could not name the shape, but I can see a black buoy farthest.—263. Black.—264. Black beacon buoys.—266. Black beacon buoys.—268. Black.—269. Conical buoy, red or black.—270. Black, nun.—271. Black.—272. Black.—273. black.—274. I think black buoys can be seen at the greatest distance at night.—275. Can buoy, red.—276. Black.—277. Black, with white chains.—278. Not particular as to colour, but most of the buoys in use are too small.—279. Black.—280. Black or striped.—

281. Red.—282. Black; nun or can, if of good size.—283. White, and conical.—284. Black.—285. Black or red; can or double cone, such as the one at Tay Bar and back of Goodwin.—286. Bell shape, of black colour, is best seen at night.—287. Nun buoys, black.—288. Can buoys, shape; colour, black.—289. White, conical shape, but would recommend red buoy where there is surf or broken water.—290. There is no colour of buoys visible in a dark night. Bell buoys is the only remedy for safety of life and property along a range of sand banks, such as the Goodwin Sands, and along the east side of the banks, from Dublin Bay to the Tuskar light. A black buoy, in daytime, is visible at the greatest distance.—291. Can buoys present the largest surface; black or red are best seen at night, or striped with white vertically.—292. The nun buoys, black or red, are best seen at night.—293. Black nun buoys.—295. Conical buoys.—296. Large black nun buoy.—297. Black, best.—299. Can buoys, white painted, is best seen; but when buoys are black, white letters or figures are of great utility.—300. Nun shape; colour, black.

301. Black.—302. Black, red, conical.—303. Black, can shaped.—304. White, bell shaped.—305. The large beacon buoy.—306. Black nun buoy.—307. Black.—308. Nun buoys, painted red or black, are best seen, in my opinion.—309. White.—310. The buoy that stands the highest above the water can best be seen, and its colour black.—311. Black.—312. Depends on the weather.—313. Black or red.—314. Black, or some dark colour, is best seen at night.—315. Can buoys, black.—316. Can buoy, and black.—317. Dark, say black or red; spars buoy.—318. Nun or can buoy, black.—319. A nun buoy, and black.—320. Black.—321. Cannot say exactly, think the round buoy, and dark colour.—322. Long nun buoys, black; swimming or moored; on end or upright.—323. Oval, red or black.—324. Depends on state of atmosphere.—325. Black, and of the usual form.—326. Nun buoys, black.—327. Those that are can built, and of a dark colour.—328. Black or red.—329. Can buoys, and black.—330. Black, and pointed top.—331. Black.—332. Red or black.—333. White.—334. Black.—335. Colour white.—336. Egg-shaped buoy, and black colour.—338. White.—339. Black nun buoy.—342. Black, I think; water being more the colour of the water.—344. Black, conical-shaped buoy.—345. Black.—346. Round and white.—347. Black.—349. Black.—350. Nun buoys, painted black.—351. I think black; unless the night is very dark, and then white buoys are more easily seen.—352. Light-coloured, nun.—353. Black.—354. Round and white.—355. Black.—356. Black.—357. White.—358. Black, nun buoy.—360. Colour, black.—361. Black buoy, with cone on top.—363. Nun buoys, black.—364. Black best seen. Nun buoy shape best.—365. black.—366. Cannot tell.—367. Black nun buoys.—368. Black.—369. Black, oval I should think.—370. Red, nun buoy.—371. Black.—372. Nun buoy, red.—374. Black is preferred by the pilots here, as best seen at night. For shape, see sketch No. 2.—375. Black.—376. Chequered.—377. Much depends on the state of the atmosphere.—378. Large nun buoys, with dark colours.—379. Red or black beacon buoy.—380. Beacon buoys, black.—381. Black.—382. Black beacon buoy.—383. Nun buoys, and black.—384. I can see black best at night.—385. Nun buoys, of large size, painted black.—386. I suppose, white nun buoy.—387. Nun buoys, black; and in a fog, red.—388. Black.—389. Black. White and chequered buoys are hard to find out, day or night, in broken water.—390. Cone-shaped and black.—391. Black nun.—392. Opinions differ. Some say the black nun buoys are best.—393. Black can buoys.—394. Black and red, the shape of an egg, not flat top.—395. Nun buoys, and white.—396. Red.—397. Black can buoys.—398. Black, convex, with flat top painted white.—399. Red.—400. White can buoys, or striped with red and white, or black and white.

401. Conical, and black or red.—402. Black buoy, with perch.—404. Black can buoy.—405. Black, with square end.—406. Black.—407. White can buoys.—408. White, and conical.—409. Black.—410. Black.—411. Camister buoy, colour white.—412. De sorte indelsingsboier ter Liverpool.—413. Declines to give an opinion, not having much experience in seeing them.—414. White.—416. Black.—417. Black, thus.—418. Black.—419. Red, shape conical.—420. Cone, chequered B. and W.—423. Black, or any dark colour.—424. Buoys ought to be larger, in order to be seen in the night. White and black colour is good.—425. Black, conical.—427. I do not know.—428. Black.—429. This depends so much on the state of the atmosphere, it would be difficult to say.—331. Black and conical.—432. Black.—433. White, if the night be very

dark; black, if moonlight.—434. Black and red.—435. Cone and black.—436. Red or black.—437. Can buoy with perch, checked.—438. White.—439. Black.—440. Cask, black.—441. Red.—442. Striped light and dark.—443. White, conical shape; but would recommend red buoys where there is surf or broken water.—445. Black.—446. Double cone, black.—447. Black and conical.—448. Dark coloured.—449.—Black.—450. Moonlight, black buoy; starlight, white buoy.—451. Black.—452. White in moderate weather, and black in rough weather.—454. Black.—456. White.—457. White, conical.—458. White.—459. White, in my opinion.—460. The large beacon buoys.—461. Black.—462. Black, nun shaped.—463. Nun, with staff and ball. Black colour.—465. White.—466. Black, nun buoy.—467. Could not say.—468. Black.—469. Black bell-shaped buoy.—470. Nun buoy, black.—471. Colour, black.—472. Round, and painted red.—473. Black buoy, with cone.—475. Colour immaterial for night, but all buoys should be so moored as to show set of tide.—477. Black nun buoys.—478. White.—479. Black.—480. Black.—481. I should say black, nun, or can buoy is best seen at night.—482. Shape, nun; colour varied according to the light or darkness of the night.—483. Conical buoys, painted white, I conceive the best seen at night, with bells at dangerous points.—484. Black (on water), tar-barrel shape or conical, with large end up.—485. White, with pinnacle.—486. In my opinion, the pilot are only capable of answering this question.—487. Black.—488. Cannot say as to shape, but consider black the best colour.—489. Conical, black.—490. Black, conical at each end.—491. I think dark colour.—492. White.—493. Nun buoy, black, with a white perch.—494. Black or red buoys can be seen best at night.—495. Conical, with ball on top, and painted black.—496. A light colour, perhaps a light red. White can be seen farthest, but may be mistaken for a topping sea.—497. Conical, black.—498. Black buoys, with pole and ball.—499. Black, for all sorts of weather, with square top.—500. In general, black, I think.

501. I would prefer conical buoys, with a white ring painted on them for night use.—502. Black with flat top.—504. White.—505. Black, with round top to stand erect.—506. Nun buoys, black.—507. The shape, what is commonly termed the nun buoy, which are best made of plate iron; the colour, white.—508. Black can buoys.—509. Black.—510. Black long nun buoys.—511. Spiral.—512. Can with ball, red.—514. Black, and shaped as Bristol Channel buoys.—515. Red and black.—516. Black nun buoys.—517. Large can buoys; black and white striped or chequered.—518. Black; some say chequered.—519. Hal, nun or can buoy; black.—520. Black and high.—521. I think black; I would also recommend a uniformity of colour throughout the United Kingdom of leading or fairway buoys, say black on port hand, white or red starboard.—522. Black colours and spiral shape, with staff and ball.—524. Black.—525. Dark colours.—526. Black; nun shows higher than a can, being conical.—527. Colour, black, with large round end.—528. With a conical point, and black.—529. Black.—530. Red.—531. Bell shaped, and coloured black and red.—532. Fixed, bright.—533. Black nun buoys with ball beacons.—534. Black nun buoys.—535. Black; shape, that which shows the greatest elevation in a tide way.—536. Dark coloured buoy.—537. I think globular shape, and black and red colours.—538. Upright buoys, black top, white sides.—539. Red; a nun buoy in shape.—540. The nun buoy is decidedly the best, and black.—541. Red or black at night; nun or can buoys, much depends on the atmosphere.—542. Tin can buoy with a perch on it.—543. White in smooth water; black in rough; shape, I think, of little consequence if sufficiently bulky.—544. Conical and black.—545. Half oval and black.—546. The conical ones, black and red.—548. Black nun.—549. White.—551. Nun buoys, black or red.—552. Round, black.—553. Chequered.—554. Black.—555. Red or black beacon buoys.—556. Black, and nun shape.—557. Nun (shape), black (colour)—558. Decidedly the best buoys are Peacock's and the inverted cone buoy. All black and white more readily distinguished, mixed or red being very difficult to make out satisfactorily.—559. Black, with flat beads.—560. Red and black, particularly on the edges of a sand, or where there are breakers.—561. Cylindrical, floating upright; bright red or black.—562. Beacon buoys, chequered.—563. Black and red.—564. I think a black conical buoy.—565. I think black and white buoys are the best night or day, and then only to be made use of in general.—566. Spiral, dark.—567. Nun and beacon buoys.—568. Beacons; red or black.—569. Black can buoy.—570. Beacons; red or black.—571. Conical buoys of a dark colour I think are best seen at night.—572. Black, and the

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larger the better.—573. Red, can.—574. Black.—575. Black can buoy.—576. Black.—577. Black cone.—578. Flat-headed can buoys, painted any dark colour.—579. Nun with staff and ball; black.—580. Colour black.—581. I prefer black; shape immaterial.—582. White in smooth water, black in a sea way, and conical.—583. Black or red; conical.—584. Black or red, conical shape.—585. It depends somewhat on the darkness of the night and the roughness of the sea.—586. Buoys of a larger size, similar to some lately laid down in the Victoria Channel; float can buoys best.—587. White in smooth water, black in rough water; conical.—588. Conical; black when there is any sea; white, or chequered black and white, in smooth water.—589. Black; as lap and conical as possible.—590. Spiral and black.—591. Shape, conical; colour, black.—592. Black or red.—593. Nun buoys, coloured cream colour.—594. Black.—595. My opinion is, that black buoys of the spiral shape could be seen better than the flat top buoys of any colour.—596. Nun buoys, black, such as on the Knock.—597. Black or red.—598. Nun buoys, black.—599. In a dark night, white; in a light night, black; those that stand well up out of water are best.—600. Black or red.

601. I have always been of opinion that black is the best colour, and a large can buoy as good shape as any, perhaps the best.—602. Black and red.—603. Nun buoy, with staff and ball white.—604. I consider from my experience that black buoys of cylinder shape can be seen furthest off at night.—605. White.—606. Conical, black.—607. A black can buoy.—608. Black.—609. A black buoy.—610. A black can buoy.—611. A black can buoy.—612. Black, conical.—613. Black, particularly if kept well painted.—614. A black nun buoy.—615. A black nun buoy.—616. A black can buoy.—617. Black.—618. A black nun buoy.—621. Black.—622. Black can buoy.—623. Black, conical.—624. Conical and black.—625. Black, decidedly, and I think, if large enough, shape immaterial.—627. Black, and large enough; the buoys at entrance of Liverpool are excellent as to size and shape.—628. Brown and red.—629. Black with a ball at the top can be seen at a great distance, especially a fairway buoy.—630. Chequered black and white.—631. Black.—632. I think the nun the best shape as it is generally more out of water, and I always could see a black buoy best at night, particularly if any broken water.—633. Cone, and dark colour.—634. Black.—635. Black.—636. Large spiral buoys painted black.—637. Black.—638. I think that black conical buoys are best seen at night.—639. Black nun buoy is best to "pick up" at night with a good night glass. I have often found every black buoy on the whole length of the Elbe at night.—640. A black buoy.—641. Depends on which side the light is coming; generally I prefer red and white striped.—642. Black nun.—643. Perhaps chequered best, but it is a difficult question to decide.—644. White.—645. Black.—646. Black.—647. Black nun buoys.—648. Black, and the shape of a cask.—649. Black can buoy, or such as the fairway buoy off Queen's Channel, Liverpool.—650. Conical, black or white.—651. In fogs white is decidedly best seen, at night "la chose est problematique."—652. To be seen at night time, more depending upon size than shape; prefer dark colours.—653. Black, with inverted cone.—654. Black.—656. The conical shape which swim upright, and coloured black.—657. A cone-shaped or spiral buoy, and painted black, or of a very dark colour.—658. Black conical.—660. Black can.—666. I think black, and this shape.—667. Black.—668. Black, with staff and ball, or other beacon.—671. Red, as the general colour, some black, and of a conical shape, are the most easily made out.—672. Black nun and can.—673. Black nun buoys and red can.—674. Spiral, and painted black.—675. Black.—676. Cone-shaped and black.—678. Conical and black.—679. Conical, white.—680. The nun shape, and the colour black or red.—683. Black conical buoys.—684. Black.—685. Conical and black.—686. Black, always, undoubtedly.—687. Black conical buoys with beacons.—688. The black buoys.—689. Cone buoy, white.—690. Can, black.—691. Black and red; only required to be sufficiently large, and the sides of the channel distinguished as now.—692. Circular, white and black, and white striped.—693. A nun-shaped buoy painted black.—694. Shape, nun; colour, red or black.—695. Black and conical.—696. Black beacon buoys.—697. Black.—698. Any shape if sufficiently large; black.—699. The can buoy is the best generally, but it is a question whether at night a nun buoy is not more readily seen; colour, red or black.—700. A conical buoy of a black colour.

701. White or black, as the night may be thick or clear.—702. Black and conical.—703. Black.—704. Cone shaped

and black.—705. Spiral, black or red.—706. Bell-shaped, black.—707. Black can buoy.—708. Spiral or nun buoy, black or red.—709. Nine pins, black.—713. Black nun.—715. I think the nun buoy painted black.—716. Black nun buoys.—717. Large nun buoys, black.—718. Red can buoys.—719. Black nun.—720. Red can buoys; and beacons, nun buoys.—721. Black and red can buoys of large size.—722. Black.—723. Nun and can buoys, black and red.—724. Black.—725. Not being a nautical person I cannot answer this question sufficiently.—726. Black and red; size more important than shape.—728. Round flat heads, colour white.—729. Conical shape, colour black.—730. I think the darkest colours, and those with balls, the best seen; but this could be ascertained by mooring the different kinds of buoys together, and examining them at different times, distances, positions, and states of weather.—731. Nun buoys, black.—732. Round, and red.—733. Black, except where buoys close to land (with a dark background) are placed.—736. The form of a cask is best seen, and painted black.—737. A black buoy (or nun).—738. The large black buoys.—739. Conical or spiral shape; black or red colour.—740. Black or red.—741. Black or red.—742. Conical or spiral; black or red.—744. The best form, in my opinion, is that of the elongated cone, floating upright, and its apex surmounted by a sphere, cross, or triangle. As to any single colour, that depends much upon the state of the atmosphere and sky, and the amount or absence of moon or starlight; but the best general mode of painting buoys, so as most readily to catch the eye under all circumstances, would be in alternate horizontal stripes of red (or black) and white. This would not do now in some places, however, where particular buoys are so distinguishingly painted, except by the establishment and enforcement of a general system of buoyage.—745. A buoy that will float high out of the water, and painted black, is, in my opinion, the best to be seen at night.—746. Conical, black or red.—747. Black and red, and, I believe, conical.—748. White, and usual shape.—749. Black.—750. Black.—751. Black; can.—752. White, with staff and basket.—753. Herbert's patent iron buoys, that float upright.—754. Should say a dark spar buoy, with, perhaps, a light-coloured cage or ball.—755. Oblique, and black by night or day.—756. White.—758. Beacon; under high, dark-coloured land, white; off shore, black or red.—759. I think half sphere, with beacon built on top (colour black).—760. I think that black buoys, of the common shape, are best seen at night.—762. Black, conical.—763. Black.—764. Black.—765. Black, nun.—767. Black.—768. Black.—769. Black, with white tops, as described in reply to Question 15, but white in preference to red, as red is a bad colour to see at night; colour fades so much.—770. The larger surface the better, and black or a dark red.—771. The can buoys are best, and painted with black and white stripes, vertically, horizontally, and chequered.—772. I think a white spiral buoy is best by night, in my opinion.—773. Black, or red, or chequered, as a general rule (of Peacock's pattern); but in narrow harbours and high land (such as Dartmouth), white buoys would at night contrast better with the land.—774. Conical shape, black or red colour.—775. I can see conical-shaped and dark-coloured buoys best at night.—776. Conical buoys, of black or red.—777. A cask buoy, black and white.—778. Black.—779. Black.—781. Black.—782. Those that stand highest, and show most body; nun buoys have generally this character; black or dark-coloured.—783. Black can.—784. Sometimes conical, generally oblong, round; a thorough good black.—785. Have not had any occasion to use them.—786. Conical shaped, and dark colour.—787. Black can buoys.—789. Shape, nun; colour, black or red.—790. Black, or black with white band half way between water mark and top.—791. Red and white colour, triangular shape.—792. Black, triangular shape.—793. Black nun buoys.

18. If you have ever had occasion to make a claim for the return of Light Dues erroneously charged, state how often, and the result.

3. No.—4. No.—5. No.—6. No.—7. No.—10. Never.—14. None.—16. None.—17. Never.—18. Never.—20. No.—21. No.—22. None.—23. No.—25. No.—26. No, I have not had to make any claim.—27. No.—28. No.—29. No.—31. Never.—32. No.—36. None.—37. No.—38. No.—39. No.—41. Never.—42. No.—44. No.—47. No.—

48. None.—50. No.—51. No.—52. No.—53. Never.—55. I never have.—57. No.—58. Never.—59. No.—60. No.—61. Never.—62. I never had.—65. No.—67. No.—68. No.—69. Never.—71. No.—72. None.—73. No.—74. No.—75. No.—76. No.—81. No.—82. No.—84. I have not.—85. No.—86. I have not.—87. No.—88. No.—90. No.—94. Never had occasion to make any claim.—97. I have not.—99. No.—100. No.

101. No.—102. Never.—104. None.—105. No.—107. No.—108. No.—110. Often had. Cannot say the exact dates.—111. None.—112. No.—113. Never.—114. I never had.—115. I had occasion to apply for return of light dues made upon my bark *Yarwath* at Kingstown, on April 30, 1859, when I called there to wait for water at Maryport.—116. No.—118. No.—119. No.—120. Never.—121. No.—122. No.—123. Never.—124. No.—126. No.—127. I have not.—128. Never.—129. No.—130. I do not recollect of making any such claim.—131. No.—132. Never.—134. No.—135. No.—136. None.—138. Never had.—139. No.—140. None.—141. Never had.—142. No.—143. Never.—144. No.—145. I never made such claim.—147. No.—148. No.—149. Never.—150. Not any.—152. No.—156. No.—160. Never.—161. Never.—162. No.—163. Never.—165. I have never had occasion to make any claim whatever.—166. No.—167. The manner in which the lights have been levied has prevented me from knowing whether any overcharge has been made or not.—170. No.—172. No.—174. No.—175. I have not.—177. No.—180. I never have had any such occasion.—181. Once, and recovered.—185. Never.—186. No.—189. No.—191. No.—193. No.—195. Not that I know of.—198. Never.—199. Never.

201. Never.—202. No.—203. No.—204. Never.—205. None.—206. No.—207. No.—208. None.—211. Never.—212. No.—213. Frequently; refunded on application to collector.—214. None.—215. No.—217. Never.—218. I never had any.—220. No occasion.—221. No.—222. None.—224. Never have.—227. Never.—228. Never. I think.—229. No.—231. No.—233. Never.—234. I never had to my knowledge, except sailing from any of the north-east coast ports, clearing out for south, and afterwards, through prevailing winds, going north about; which light dues was duly returned at the termination of the voyage by the production of the ship's log.—235. I have not.—236. No.—237. Only through oversight.—241. Not any.—242. Not to my knowledge.—244. No.—246. No.—247. In former years.—249. No.—250. I have not.—251. Never.—253. No.—256. No.—257. Once; the money returned.—258. I have not.—259. No.—260. Do not remember.—261. Never had any occasion to make claim on light dues erroneously charged.—262. I never had occasion to make a claim.—263. None.—264. None.—266. Never.—269. Not any.—270. No.—272. None.—275. No.—276. None.—277. Never.—278. Never.—279. No.—280. Such has not occurred to me.—281. Never.—283. No, never.—284. Never had.—285. I was charged for Skerries at Tralee, on a voyage to London, and when complained at London, was referred to the proprietor in Wales. I lost my money. English lights were often charged for each passage in places of once for the voyage to and from Scotland.—286. I never had occasion.—287. Never had occasion.—288. Never.—289. No.—292. I have not.—293. In old times ships from this port paid the lights for both north and south channels; but one charge was refunded on ship's return.—296. Never had to make any claim.—297. None.—300. No.

301. Never.—302. Never.—303. I never had.—306. No.—307. None.—308. I never had to make any claim.—309. I never had an occasion to do so.—311. No.—313. No.—315. Never.—316. Never had occasion to make claim.—318. Never.—319. No.—320. Never.—321. No.—322. Never have had any cause to complain.—323. No.—324. No.—325. I never had a false charge made.—327. I have had no occasion, or have I found them erroneous.—328. Not any where.—329. I never had.—330. No.—331. No.—332. No, never.—333. Never.—334. No.—335. No.—336. No.—339. Do not remember.—340. I have not.—341. No.—342. I have not.—343. Never.—344. No.—345. Have not had occasion.—346. None.—347. No.—349. No.—350. Never.—351. Never.—352. No.—353. Never.—354. No.—355. No.—356. No.—357. No.—358. No.—360. Never had occasion.—361. None.—363. No.—364. No.—366. No.—367. No.—370. No.—371. I have not.—372. No.—374. No.—375. Once, in Dublin, and got it.—376. No.—377. No reply.—379. No.—380. No.—381. None.—382. No.—383. No.—386. No.—388. Cannot recollect such claim.—390. No.—391. Not any.—393. Never.—394. Never.—395. Never.—396. Never.—397. No.—398. No.—399. No.—400. Never.

401. No occasion at any time.—402. Never.—403. No.—404. No.—405. Never.—406. No.—407. Never.—410. No.—411. I have never had an occasion.—414. None.—416. No.—417. I have not.—418. Never.—420. Never.—424. I have not.—425. No.—429. No.—431. No.—432. No.—433. No.—434. Never.—435. No.—436. I have not.—437. No.—438. No.—439. None.—440. No.—441. Never.—442. No.—443. No.—445. I never had occasion.—449. None.—450. No.—451. No.—452. No.—454. No.—456. No.—457. No.—458. No.—459. No.—461. None.—462. No.—463. No.—465. No.—466. Never had occasion.—467. No.—468. No.—469. No.—470. No, never.—471. No.—472. No.—473. None.—474. At present do not recollect the time.—475. No, never.—476. No.—477. No.—478. No.—480. No.—481. I never had occasion to make any such claim.—482. Never.—483. I have not.—485. No.—486. Never have.—487. No.—488. Never.—489. Never.—490. Never had occasion to make any claim.—491. I never had to make any claim.—492. No.—493. I never had.—494. I have never had occasion to make claim.—495. Never.—496. No.—498. I never had occasion.—499. No.—500. I never had.

501. No.—502. Never.—504. No, never.—505. Nil.—507. No.—509. No.—510. No.—511. No.—512. Never.—514. Never.—515. No.—516. No.—517. No.—518. No.—519. Not at any time.—521. Never had to make claim.—522. No.—524. Never.—525. No.—526. Never.—527. I have not.—528. No.—530. I never had occasion.—531. No.—532. No.—533. No.—534. No.—536. Never.—537. No occasion.—539. I am not aware of ever having been overcharged.—540. Yes; cannot say how often. Succeeded sometimes.—541. No.—542. Never.—543. No.—544. Never.—545. I have not.—546. None.—548. No.—549. No.—550. Never.—552. No.—553. No, not at any time.—554. No.—555. No.—556. No, I have not.—559. No.—560. Never.—562. Never.—563. No.—565. I never had any occasion to make a claim for return of light dues.—567. No.—568. No.—569. No.—570. No.—571. I have never had occasion to do so.—573. I have never had occasion.—575. No.—577. None.—578. No.—579. No.—581. Never had any occasion.—589. No.—590. No.—591. I have never been overcharged that I am aware of.—593. None.—595. I have never had occasion to make any claim for the return of light dues erroneously charged.—596. Never to my knowledge.—597. One at Sunderland; perhaps a mistake.—598. No.—599. I have not.

601. I protest every voyage against paying for the light on Cape Race, Newfoundland—nothing else.—602. None.—603. No.—604. I never had occasion to make a claim.—605. No.—606. No.—613. No.—621. Never.—622. No.—624. No.—628. None.—629. Never.—630. Never.—631. Never.—632. I am at present making a claim for return of light dues for the brig *Thalia*, putting back from Peterhead leaky, when bound to Quebec, in April last; I believe will get them back, although it appears to take some time to do so.—633. Never.—634. Never.—636. I have not.—637. Never.—639. No.—642. No.—643. No.—644. No.—645. No.—646. No.—648. No.—649. No.—650. No.—651. Never.—652. No.—654. Never. Cape Race I have never seen excepted, and it is not likely I ever shall, except in a steamer.—656. No.—657. Never.—660. Never have.—666. No.—667. No occasion.—668. I have not.—671. Never.—674. No.—676. No.—679. No.—680. No.—685. No.—687. No.—688. Never.—691. No.—693. I have never claimed a return.—695. No.—698. No.—700. Never.

701. Had no occasion.—702. None.—703. No.—704. No.—706. Never.—707. Never.—708. None.—709. Never.—715. I never had.—717. No.—718. I do not recollect having done so.—719. None.—720. No.—722. Never had any.—723. No.—728. No.—729. No.—730. I have never made a claim for a return of light dues, but may have been overcharged. It is generally the brokers to pay these bills, and masters have seldom time to examine them.—732. No.—733. No.—738. Never.—741. No.—744. No.—745. No.—746. Never.—748. Never.—749. No.—752. Never.—753. The collection of light dues might be much simplified. They should not all be levied on shipping, but on goods as well. Steamers should pay, on builders' measurement, as lights have been multiplied expressly to facilitate steam navigation.—754. Never.—755. No.—756. Never.—758. No.—759. None.—760. I never had any.—762. Never.—765. No.—770. No.—771. No; never.—772. No.—773. No.—777. I never had any.—778. No.—784. No.—791. I never have.—792. I never have.—793. Never.

19. Has it ever occurred to you that any particular system of Lighting, different from that at present employed, would have facilitated navigation?—if so, describe the system that would, in your opinion, be an improvement.
1. I know of no better than the present system.
 3. No, never.
 5. I cannot possibly think that any system better than that at present employed would facilitate the navigation.
 6. No.
 8. I am not prepared to originate any alteration, but would endeavour to give sound replies to any suggested differences of system.
 10. I think that if an illuminated figure or letter could be exhibited at every lighthouse, with a reference to the same in the lighthouse book, published by the Admiralty and others, it would prevent the possibility of mistaking the light.
 13. It has occurred to me that many useful harbours might be opened to night navigation at a comparatively trifling cost, by means of one or two Argand lamps hoisted on a staff, and made sufficiently distinctive from local lights, by coloured shades. A small attached dwelling for the keepers would complete an establishment that would prove a great boon to coast navigation. The adoption of reflecting beacons in narrow and tortuous channels, or on dangers sufficiently near a fixed light to reflect its rays, would materially extend the benefits of that light. Reflectors might be made of highly-glazed tiles or other cheap material uninfluenced by weather. I yet hope to see an invention for rendering buoys and beacons self-luminous.
 14. I can see none better than the present.
 17. No.—20. None.—21. No.—22. None.—23. No.—24. No.—25. No.—26. I cannot see at present any better system.—27. No.—28. No.—29. No.—30. No.
 34. The light lately established on the Needle Rock would be far better white seaward. The red light cannot be seen at so great a distance as white; and the same might be a flash or revolving light, that vessels, when making a light in so critical passage, may not mistake it; also that a large staff nun black buoy be placed on the south-west port of the Shingles, instead of the present small bell buoy.
 37. Never.
 39. Strong flashing light is preferable to red or any coloured lights, or to a total eclipse.
 40. There might be an improvement made in the Gunfleet lighthouse. By disappearing or altering the colour of the light when approaching the sand.
 41. No.—42. No.—46. No.
 47. A coloured light (red) of a defined angle, say, from about S. by W. to S. $\frac{1}{2}$ E., shown from the tower of the North Foreland lighthouse, would be of great service, and facilitate navigation in the vicinity of Margate Sands in dark nights.
 49. No.—50. I know of no better than the present system.—52. No.—53. Never.—55. It has not.
 56. I think Hurst light, that is visible up the Solent, should be one colour while in a fair way, and differ on approaching either shore, being bound to or from Cowes Roads.
 57. No.—58. Never.—59. No.—60. No.
 61. I think our present system good as far as it goes; but I think we might have still greater brilliancy and power.
 62. No.
 63. I know of no better than the existing system.
 65. No.
 66. I think it would be an improvement in the Gunfleet light by disappearing or altering the colour when approaching the sand.
 68. No.—69. No.
 70. I consider there might be an improvement made in the Gunfleet light by disappearing or altering the colour when approaching the sand.
 71. No.—72. No.
 73. I know of none better than that in use.
 74. It has not.
 76. In the United Kingdom, no; on the coast of Spain, yes. Lights are requisite on the Plains of Etmere, Cape Palos, and on the Island of Galette, Barbary.
 79. No.—82. None.—87. No.—90. No.—92. No.—97. No.—100. No.
 104. I have found the French lens lights a great improvement in hazy weather.
 107. No.—108. No.—112. No.—114. It never did.—115. Never.
 116. See 21.
 118. No.—119. No.—124. No.—125. No.—126. No.—127. I know of none better than the existing system.—128. No, never.—134. No, never.—135. No.—136. None.—138. No.—139. No.—140. None.—141. Do not know of any better.—142. No.—143. No.—144. No.—149. It has not.
 150. None better than those in use for lighthouses, floats down; but for ships meeting each other I believe a great improvement could be made to avoid collisions, and were there sufficient space I would describe the same.
 157. No.—161. Never.—162. No.
 163. The system is very well.
 167. No.—170. No.—172. No.
 178. I think that if a uniform system were adopted, it would save much country and sometimes loss. If a particular kind of light were always shown from every headland, and another kind of light on low lands and shoals, any master making such light would know at once the nature of the danger to guard against.
 180. I believe there can and will be some system adopted before long to light up buoys, &c.; but what that system will be of course I am not prepared to say.
 181. No.—183. No.
 185. I must leave that to the coasters.
 191. No.—193. No.—198. Nothing.—203. No.
 204. Yes, would suggest a blue light or rocket shown from the Dudgeon lightvessel at stated times, say, every 15 minutes, from sunset until sunrise, visible about three leagues.
 213. Anything that will increase the power and brilliancy of light, so as to make them more visible in dark, hazy, or foggy weather, would be a decided improvement, and greatly facilitate navigation.
 221. No.—224. No.—228. Never.—229. No.
 234. Never, except where there are safe harbours for refuge available at all times of tide. A flash light to distinguish the same from all others for strangers, ships of war, &c. Refuge is a serious matter in this north-east coast, for there is none, and should be taken into serious consideration.
 237. Can you vary the white light different in colour to our plain white lights? I have been at my wits end in this particular.
 242. Never.—247. No.—250. No, I cannot.
 251. It is beyond my knowledge to answer tending in any way to improve this or either of the four following questions.
 255. I am sorry to say carelessness and not lights is the loss of many ships.
 256. No.—264. None.
 265. The newly-erected lighthouse at the Needles will greatly facilitate navigation.
 266. No.—269. Not any.—272. None.
 276. Needles ought to be flash red.
 281. No.
 282. A decided and unvaried distinction between harbour and coast lights; the former should invariably be coloured, denoting their local character.
 283. I think the present system of lighting very good. I do not see how it can be altered for the better.
 284. I believe a more general use of green lights would be beneficial. The state of the atmosphere, fogs, &c. at certain times has the effect of turning bright lights red, but green holds its colour.
 285. No; I have experienced great anxiety from the too powerful reflection of harbour lights in entering a narrow channel with a heavy sea; for instance, Valencia, west of Ireland, and Milford, in a dark night. The reflection of the light on the broken water and foam confound the judgment.
 287. In all cases of danger a green light should be used or a green flag.
 288. Never.
 292. It has not; I consider the present sufficient for all purposes of navigation.
 301. No.
 302. If the whole coast was to be relighted a more uniform system could be adopted; but the old established lights would have to be altered.
 303. It has not.
 305. I propose that a brighter light be placed on the West Cliff at Ramsgate, instead of the green light, which is

- not discernible in hazy weather, for the navigation of the Old End Channel in the night time.
309. It never has.
311. The electric light on the South Foreland makes the low light look very dim.
- 313 No.—315. I know of no improvement.—316. No.—317. No.
320. The French.
322. I could not advance any.
323. Yes.
324. No.
325. The new light at the South Foreland is a decided improvement.
329. No better system has ever occurred to me.
331. No.
332. No, very good at present.
334. No.—336. No.—347. No.
348. A system in which the different description of lights indicated a certain description of positions and dangers would, in my opinion, be an improvement.
349. No.—350. It has not.
352. The Fresnel lens to the reflector.
353. Nonc.—354. No.—355. No.—356. No.
358. Stevenson's system of lighting the channel with mid-channel lights, as shown in the Nautical Magazine.
363. Can suggest no improvement.
366. Same as I stated at Question No. 16. Buoys, on entering any harbour or channel, one colour on the starboard, and another on the larboard hand, so that any stranger could take a harbour on the right side from the colour of the light.
370. No.—373. No.
375. I would suggest no light to exceed one minute in revolving, such as the Tuskar and Fastnet, now three minutes in revolving.
377. No information.
381. I do not know any.
384. It appears to me that on each coast one or two of the principal lights might be made certain by some such shapes as a cross or a long line, or two lights.
386. I cannot say.
388. I recommend a red revolving light for Grimshy dock tower.
391. Not any.
392. I have talked with other pilots, and they say the new light on the Needles rock would be better if white seaward.
393. Never.—394. None.
396. I know nothing better.
397. No.—398. No.
399. I think nothing so good as the present system.
401. Systems should vary with the circumstances and nature of localities or objects. One system only, however excellent in itself, may be inapplicable to certain special conditions of a light.
405. No.—406. No.—410. No.
411. I think that every principal channel light should be provided with a good signal gun.
414. Never studied them.
416. No.
418. In no instance could I make any improvement.
420. No.—427. No.—429. No.—431. No.
433. Only in the case of the revolving lights, on the south end of the Blackwater Bank, which, though revolving at a different time, might be—especially by a stranger—mistaken for Tuskar. One red, one white steady, in my opinion would be an improvement.
434. No.—440. No.—445. No.—449. None.—451. No.—459. No.—461. None.
462. None, except about the Saltees, on the coast of Ireland, as referred to in No. 21.
469. No.—473. No.
474. I would strongly recommend the alteration to the revolving light on the Blackwater lightship, by having it coloured blue, which would show sufficient distance to clear Blackwater Banks; besides, it has its comrade light on the next mast to assist. By such alterations it would never be mistaken for the Tuskar light.
475. The system of danger lighthouses in these days of great speed is erroneous, and we must come to the fairway principle eventually.
476. No.—478. No.—480. No.
482. It has never occurred, as I consider the present system quite efficient, and displays great judgment.
483. I cannot speak with confidence on this subject, my knowledge of the principles of lights being limited.
484. A different system of lighting would, I think, decrease the number of accidents. A red light on all turning points,—for instance, Cape Clear, Tuskar, &c.—and then between white flash revolved; these are the lights most frequently mistaken, and always attended with the most fatal results, owing to a change of course taking place.
485. I would suggest the removal of the revolving light from the Blackwater Bank, as it is liable to be mistaken for the Tuskar, and, instead, would place three lights in a triangular position.
486. It never has.
487. No.
489. Some uniform colour or shade to all float-lights different to those required on board steam and sailing vessels at present.
494. I know of no better system than that at present employed.
495. Never.—496. No.—499. No.
500. I could not suggest more appropriate lights.
501. No.
504. I never had any difficulty by using proper caution.
505. Nil.—509. No.—510. No.—512. No.—514. No.—515. No.—516. No.—518. No.—519. None whatever.
522. I do not know of any other system that would be better than the one now employed.
524. I do not think we can improve in our system; but I do think the lights could be made as brilliant as the French.
525. I do not know of any other system that would be better than that now employed.
527. I think the lightvessels should show a blue light every half hour, the same as entrance of River Hoogly.
528. At stated periods of the year should be bound to light the houses, ships, &c.
529. It has not.
530. I consider the present system good.
533. I beg to suggest the Longships light to act red, so that vessels may know themselves clear of the Rundlestone when standing in shore.
535. The present system appears to be excellent, but there is a want of uniformity; the lights on board some vessels being of great brilliancy, while others are scarce perceptible. If the lights were of the same volume, they would not be taken for beacon lights, and the distance could be calculated more correctly.
536. No.
537. I have no remarks to offer about lighthouses or ships, but I will take the liberty to suggest a change in the lights carried by sailing vessels; instead of side coloured lights, one mast light, half bright and half red colours; lantern so made and divided that the one colour would not be seen while the other was visible.
541. I am not aware.—542. I cannot suggest any improvement.—544. No.—549. No.
552. Could one of the Lizard lights be visible a little.
553. Cannot see any better improvement.—554. No.—562. I cannot at present propose an improvement.
565. I think the system of the present lights is very good in general.
567. Not to my knowledge.—568. It has not.—569. No.—570. No.
577. An improvement might be effected by illuminating the lighthouse with the initials of its name.
578. English system adapted to English atmosphere.
579. It has occurred to me that if Lowestoft low light was discontinued, and a floating light placed at the south-west end of the Holm would be a great improvement. The Strangford Channel, south entrance, is so very narrow, that Lowestoft lights are of no use; lading vessels never use it at night, and vessels of light draught go boldly into Pakefield Gat. (*See Appendix to Mariner's Evidence, p. 579.*)
586. Formerly red light very poor.
589. No.—591. No.
592. All lights placed on high land should be removed to a lower position.
593. Yes, that of Kinnaird Head lighthouse should have a part of the white light shaded red to clear Cairnbulgh reef, and buckened to clear Tromp Head on the west; and also Duchanness lighthouse be shaded red to the northward to clear Rattray Head.
597. Never.—598. No.
601. The present system appears to me very good. I may be mistaken, but Ballycootton appears to me a very superior light to the Fasnet, which is a turning point.
602. When new lights are put to be distinguished as much as possible, whereby lights are with blue and green.
604. I would not suggest any alteration in the present system.
605. No.—606. Never.

609. The electric light being far more brilliant than any in use, would facilitate navigation if it could be practically employed.
610. The electric light would be a great improvement if it could be brought into use.
613. No.
614. If the electric light could be brought into use in the most important lighthouses, I think it would be an improvement.
616. If the electric light could be carried out, I think it would be an improvement.
618. Yes, an electric light which was exhibited for experiment on the landing stage, Liverpool, I think is brighter than any other light I have ever seen.
621. No.
622. I think the present Admiralty rules regarding lights, if observed by sailing ships as well as steamers, are admirable.
627. Revolving or flashing light (in my opinion) should always be used (where practicable). I have frequently mistaken a ship's light for a fixed light; (say) Smalls, for instance; in situations where there are fires frequently on shore they are liable to cause mistakes.
631. From my position with the Trinity Corporation I do not consider myself at liberty to attempt any replies to the Special Questions, without their special permission.
633. It has not; I believe the system good.
636. I know of none.
639. I think it has been a grave mistake from our earliest records, the placing lights high above the horizon.
640. Where practicable I consider gas would be preferable to oil.
642. Never.—643. No.—644. No.—648. No.—650. No.
651. I have had my attention turned to lighting both land and water, and well remember the London street lamps, and the coal light shown as a fire on the Isle of May, now happily departed. Gas light is more brilliant than oil light, the Drummond light better still, and the electric light is certainly brilliant, space-penetrating, and peculiar, but its practical application to lighthouses is yet problematical—not so with gas.
652. No.
654. None other than to give stronger light, still I have never given it my attention.
658. No.—660. No.—666. It never has occurred.—668. It has not.
671. The system of any particular mode of lighting has never occurred to me, except varying colours of lights according to ports, which I believe is done.
674. No.
675. I know of nothing better.
676. It has not, as I have never found the slightest difficulty in navigating the Channel under the present system.
678. I think the present system very good.
679. No.—683. No.
685. I can suggest no improvement on the present system.
687. No.—688. It has not.
689. An electric light.
691. As few fixed lights as possible.
697. No.—698. No.—700. No.
702. To have floating lights exhibiting coloured lights as well as bright lights.
704. I do not; but a plan was proposed for lighting the English and Irish Channels by stationary fairway lights. I gave it my best consideration, and came to the conclusion that such a plan could not be carried out.
705. No.
707. I have recently seen Major FitzMaurice's light, and I am of opinion it could be most advantageously employed.
709. It never has.—715. It has not.
718. I have formed no opinion.
722. I do not know of any way of improving it.
728. It has not.—729. No.
30. I have long thought that nearly all fixed lights might be made of much greater service if they were constructed so as to change their colours, and darkened on the edges of shoals, and near the shore, to denote when vessels come near any danger. The bearings by compass and soundings cannot always be depended on. I think there might be some improvements made to distinguish the different lights more easily from each other. There might be more on the revolving principle. This plan could be carried out safely to a much

greater extent by varying the times and colours. Strangers will have some difficulty in making out their position when they are in situations such as outside of Yarmouth Sands, where there are so many lights of the same appearance.

733. No.
736. The present system of lighting seems to me good.
737. I think that gas, or the electric light, if practicable, would be more brilliant.
744. I would suggest that long intervals of observation in revolving lights are very objectionable and dangerous especially where fogs or heavy rains occur, and that change of colour might in many cases be substituted for revolution (or at least for long entire obscuration) with advantage.
745. I think if the present lights were rendered more powerful it would be an improvement.
747. It has often occurred to me that if one of the Nab lights was made either red, or red revolving, it would facilitate the navigation to the inside of the Isle of Wight. I have many times had great difficulty in making it, from not being able to distinguish the two lights until within a mile and a half of her, and even less, and have had a cast of the lead, being in doubt as to whether it might not be the Owers. As to the question of facilitating navigation by any particular system of lights, I am confirmed in the opinion that the position lights in sailing ships are attended with danger, owing to coloured lights not being visible in hazy weather at a great distance; that through neglect, more particularly in small lanterns, they become so smoked as to render the lights almost invisible. I think if the rule had been that all sailing vessels, immediately they discovered a sail or light, should show a bright or white light, and keep it thus shown until she was answered by the other with a bright light, when both should take in their bright lights, and attend to the rules as at present laid down. I think such a rule would have caused more attention to the present lights in general, as I believe in many cases the lights are set up at night, according to law, and very little notice taken of them afterward. This being the case, vessels nearing each other have no means of knowing if there is a good look out kept by the approaching vessel, whereas the bright light would be a warning light. It might be kept in the binnacle or companion, so as to be always at hand. In case of a steamer, as she carries a bright masthead light, she should answer the sailing ship with the coloured light agreeing to her side light, that the sailing ship is on her quarter. In cases of steamers sighting each other, and crossing at right angles, the first to show a light might show to the other how she has or intends putting her helm, by showing the green light if she starboards, or the red light if she ports. By being answered by the same colour she will know she is understood, or by a contrary colour that she is not, or that a mistake is made, and will stop. It has happened to me in crossing the channel from Isle of Wight to France that a steamer going down channel would probably have come in collision had I kept on, as I did not know which way she would put her helm, although, from her being on my port bow, and my red light and masthead light only to be seen by her (both of which was clear and bright), and crossing at right angles, I think I had a right to suppose she would port her helm. Being in doubt as to what she would do, and whether she had a good look out and saw me, I stopped, and I think did right, as she crossed my bows. Had the rule been as I have stated, and she had shown me a green light, I should have starboarded, not having any doubt as to her look out, or whether she would port at seeing my red light, in case of the look out being neglectful, and suddenly discovering it.
752. No.
754. It never has. I believe the present system as near perfection as is attainable; should be reluctant to change.
755. No.—756. Never.
757. The Trinity House of Newcastle-on-Tyne have jurisdiction over the lights, buoys, and beacons connected with the River Tyne (but not over the Tynemouth lighthouse), and (besides other dues) they levy large sums annually for their maintenance, not only on ships using the Tyne, but also on ships visiting the other ports of Sunderland, Seaham, and Blyth. It appears by the Report of the Royal Commissioners on

Local Charges (1854, page 443.) that the Trinity House levied in the Tyne in 1852, 1,376*l.* 17*s.* 10*d.* for Shields Harbour lights, and 98*l.* 16*s.* for Newcastle buoys and beacons, besides 803*l.* 4*s.* 6*d.* levied in the other ports above mentioned, in respect of the Shields Harbour lights, which are of no benefit whatever to vessels using those ports. It is impossible that the two Shields Harbour lights can cost annually anything approaching even the amount levied within the Tyne; and I do not hesitate to assert that the sum annually levied for buoys and beacons is enormously beyond the cost of their maintenance. The other ports ought at once to be relieved by law from the burden of these dues. And as regards the Tyne, there is no necessity for the Trinity House having any longer this duty intrusted to it. The River Tyne Improvement Commissioners could much more efficiently discharge the duty, and thereby effect a very great reduction of the taxation of the Tyne. See Nos. 3 and 19 of the Recommendations of the Royal Commissioners on Local Charges on Shipping, Report, page 46.

758. No.

760. It has often occurred to me that, where there are two or more lights on shore they should not be of the same colour, so as to distinguish them from other shore lights.

761. Lights on the same vessel and mast at the Blackwater Bank, Wexford coast, one 20 feet, and the other 30 feet from water, could scarcely have been taken for the Tuskar, even if the mistake had been the occasion of the loss of the *Pomona*.

762. It appears to me that a greater distinction is necessary, either by the employment of coloured lights, or increased numbers. The coloured lights would be open to the objection of being seen at unequal distances in thick weather, unless this could be remedied by proportional increase of power in the colours most difficult to be seen.

763. Where practicable, there should be two leading lights into all harbours, or to clear dangers; that is, two lights to be kept in one. Iron ships frequently experience great trouble running in by bearings.

772. I think nothing can exceed the present (I mean six years ago) system of lighting or management of the Trinity House Corporation, London.

773. It has not.

777. I think the present system of lighting the coast is good.

782. The multiplication of lights renders it necessary to vary their appearance; but the more simple they are the more easily described and recognized, and a few varieties of a well understood appearance would be found sufficient if properly distributed. There should be a marked distinction between harbour lights and leading or headland lights; the former should always be coloured.

789. There should be green lights to all small harbours, and river dangers, to distinguish them from the principal harbours, headlands, rocks, and lightvessels.

791. In Dublin Bay, Howth light being made a flash light, Kingstown East Pier light a fixed bright light.

20. If you have formed any opinion as to the extreme height above the level of the sea, which should not be exceeded in placing the Light of a Lighthouse on the Coasts of the United Kingdom, mention the height.

3. I have not; all must depend on the purpose for which the light is erected, whether for local navigation or great distances.—5. My opinion is, that no lighthouse should be more than 300 feet above the level of the sea: if above that height, it is often enveloped in fog.—7. No; I have not considered the point.—8. 200 feet.—10. It is well not to have the light too high, on account of foggy weather. Lundy light is frequently not visible, although the island can be seen; and the necessity of height must depend on the character of the light.—11. As low as possible.—12. 250 feet.—12. I consider that, where practicable, a height exceeding 300 feet should be avoided. Greater altitudes are liable to be at times obscured by hanging clouds.—14. I have never formed an opinion.—17. I am quite satisfied with the present heights.—18. There is at

times; a very high light cannot be seen.—20. No.—21. No.—22. None.—23. No.—25. No.—26. I have no idea as to the extreme height; those I know seem quite high enough.—27. No.—28. No.—29. No.—30. No.—40. I consider the lights are of a sufficient height.—42. No.—51. 50 feet.—52. I have never sufficiently studied these things to give an opinion.—55. The Needle lighthouse is not high enough, I think; that is my opinion.—57. I have never sufficiently studied these things to give an opinion.—59. I cannot determine.—60. No.—61. I have not thought of this point, but believe it desirable to place our lights as high as possible.—62. I have not formed any opinion as to this question.—65. I cannot form an opinion on the subject.—66. I consider the lights are of a sufficient height.—70. I consider the lights are of a sufficient height.—71. No.—72. 150 feet.—73. It should never be less than 80 feet, and not higher than 250 feet, as then it gets hazed when it is more.—74. I have not, but should judge a moderate height the best.—76. I have not formed any opinion.—82. No.—84.—I have not.—86. I have not.—87.—No.—88. About 250 to 350 feet.—89. I believe the *Call of Man* light is too high from the sea coast.—90. No.—92. No.—97. I have not.—100. No.

103. 300 feet.—104. No, but I consider Barra Head too high.—107. No.—108. No.—112. No.—113. I think 200 feet high enough.—114. I have never formed an opinion.—118. No.—119. No.—121. I have not, but consider it a most important point, particularly where a lighthouse is to be placed on a headland liable to be enveloped in fog.—125. No.—126. No.—128. I think the lights are well regulated to their locality.—131. Cromer stands highest, and is seen furthest off.—134. I cannot say any other than the lights with which I am best acquainted are best suited to their locality; viz., Isle of Wight to the Thames.—135. No.—136. Greatly depends on the weather.—139. No.—140. Nil.—142. No.—144. About 200 feet.—150. As there are various parts subject to mist, which is well known to the residents at those places, it is quite clear the lower the light is in reason the better it will be seen.—157. 500 feet.—161. About 250 feet.—162. Never formed an opinion.—164. A moderate height, say 100 to 300 feet, with a free horizon all round, or as distant from objects in the horizontal line as possible.—167. No.—170. No.—172. Have not.—174. No, but I have noticed high lights more frequently obscured by mist than the lower ones.—179. 130.—180. For various reasons I never have formed any decided opinion.—181. None higher than Fastnet.—185. I must leave that to the coasters.—196. Height of the Start light, Beachy Head, Portland, and *Call of Man* light, being very difficult to see in foggy weather.—198. Never formed an opinion.

202. I should think no lighthouse ought to stand more than 350 or 400 feet above the level of the sea, with land behind to act as a reflector as well as to attract low clouds, which hang often on the highest points.—203. No, so much depends on the atmosphere.—213. Lights exhibited from lighthouses placed on isolated rocks are seen furthest in all weathers. If the land in the background of a lighthouse is high the light should be kept low, and as far distant from it as possible.—228. Would not be positive, but I think a light 200 feet above the level of the sea best calculated to answer the purpose intended. Lights at a high elevation become capped, or immersed in fog and clouds; when very low, and near the sea, they become partially obscured by spray.—229. No; but I nevertheless consider they cannot be too high.—230. I cannot state the extreme height that should not be exceeded, but moderately low lights are certainly seen the furthest.—234. The height of the light is not of so much consequence as the distance it can be seen from the deck of a ship at sea in clear weather, the circumference of which should be marked out on all charts, especially on the coasts, the height of the lights to correspond with the approaching dangers, especially unseen dangers.—237. Yourselves may decide. In a clear dark night a high light is preferable; but a damp heavy air that lurks on top of high lands, as we often see it, then a low light is preferable.—142. I never formed any opinion on this matter.—244. No.—247. No opinion.—250. My opinion is, 300 feet is high enough for any light to be above the level of the sea.—252. I think it advisable that no light in the English Channel should be very high, as the tops of the headlands are frequently capped with mist, especially with south-west winds.—254. I think 150 feet above the level of the sea is high enough for a light; for instance, the Bell Rock and Buclaness lights are lowest on the coast, and they are best seen with thick hazy weather.—255. I have found by my experience 30 or 40 feet; as, if higher, mist generally rests on high

land.—256. I have not.—258. Depends on the locality.—260. Never.—263. 150 feet. The light on Lundy Island is too high; it seldom can be seen from Ilfracombe, North Devon.—270. 100 to 120.—272. None.—274. I have always found in passing Lundy in heavy weather, that the light on it was invisible, although the isle itself could be plainly seen at 3 or 4 miles' distance.—275. No.—276. No.—278. Have never studied the thing.—281. Depends on circumstances.—282. Generally, the greater the elevation the more liable to observation. I should consider 200 feet the maximum, which would enable the light to be seen 19 miles from the deck of a small vessel.—283. Where fogs are prevalent I think a lighthouse should not exceed 200 feet above the level of the sea; if in a clear climate, it might be higher.—284. From 200 to 300 feet.—285. So as to be seen 15 or 20 miles. Cape Clear was, Bana Head, Mull of Cantyre, Cape Wrath, Dunnet Head, Swanborough Head, &c. are too high, and are often obscured. Also South Foreland and Needles are often obscured from their too great height.—287. I think 300 feet sufficient for any light, and in the vicinity of high land 200.—288. I have never formed any opinion on this matter.—291. I have always been of opinion that the best height for a light is that ranging with the Eddystone, Hurst high light, Dungeness, Orfordness, Cromer, &c.—292. I have not.—299. I think, should not exceed 400 feet, as it is apt to get obscured by light fogs.

301. Say 100 feet in hazy weather.—302. So much depends on the state of the atmosphere, but I prefer a high light; 500 feet is not too high. A better lantern in the old modes would have been better than the new.—303. I should say lights ought not to be over 150 feet.—310. I cannot say what should be the extreme height, but find high lights very often obscured by fog.—311. From 180 to 200 feet.—315. I have not.—322. The Wicklow lights have been often enveloped in fog when the horizon has been clear, and the Needles light formerly, but not so with the new lighthouse.—323. No.—324. From 300 to 350 feet.—325.—I do not consider it well for lights to be placed very high, particularly when fogs prevail.—327. Not exceeding 200 feet; any higher they are generally clouded.—329. I cannot say, nor have I formed any opinion.—332. No.—334. No.—335. 120 feet.—336. 150 to 180 feet.—347. A light should certainly not exceed 200 feet.—348. 150 feet the extreme, 75 the mean.—349. No.—350. I have not.—351. I have expressed an opinion thirty years ago that the Needles light ought to be placed where the mature judgment of the Elder Brethren of the Trinity House has at length placed it. I think all harbour lights should be placed low; not exceeding 100 feet above high-water level.—352. 200 feet.—354. Never formed an opinion.—355. Formed no opinion.—356. No.—361. From 100 to 200 feet; not more, as it is often above that height they are often enveloped in haze or fog; for instance, there are the Fastnet, Tuskar, and Calf of Man lights can be seen when that of the Mull of Galloway, even at a short distance, is not discernible at all.—363. No.—364. Not formed an opinion as to the extreme height, but think it should not be on the highest land in the immediate neighbourhood, except it be low.—370. Not above 100 feet, if possible.—372. 200 feet.—373. No, but think a good guide to a good level might be obtained from Lundy Island and the Needles, on the one hand, where they are capped by cloud or mists that descend, and from such places as Harwich, on the other hand, where the lights are very often obscured by mists that rise from marsh and river.—375. Could form no opinion, as the state of the weather makes a vast difference in seeing.—377. No reply.—386. When a light is too high it is apt frequently to be obscured with fog. I cannot say proper height.—388. It depends on the locality. Lighthouses of great height can be best seen on low lands. High lands are sometimes cloudcapped, which would obscure a light.—390. 250 to 280 feet, but the position would affect this considerably. When anything in the nature of the land tending to cause mists occurred this would, perhaps, be too high.—391. I have not.—393. 150 feet.—395. 400 feet in general, except in hazy weather.—396. Not able to give an opinion.—398. 220 feet.

401. Generally speaking, a warning light ought to be low, and near the danger. A leading light may be comparatively high, especially if intended to be seen at a great distance; but the whole height of the lantern above the sea should not exceed 300 feet, and care should be taken that its beams of light are directed to the distant horizon, not thrown off in a plane at right angles to the vertical.—402. 100 to 150 feet.—406. No.—410. No.—414. Low lights.—420. No.—427. I have not.—429. No.—431. No.

—432. Low lights are best seen in foggy weather.—438. From 120 to 150 feet.—440. No.—442. I think 160 feet, especially on high lands, where fogs are frequent, such as the Mull of Cantyre.—445. I have not.—446. No.—451. No.—455. Not over 200 feet.—461. No.—462. Consider that an elevation of 250 feet from the sea is the best on all occasions.—471. No.—472. No; it would depend upon what kind of land it were upon.—474. From experience, I would say, not to exceed 300 feet.—475. Height should depend much upon position. Ushant, the Start, Upper Portland, the Buelings, and Cape St. Vincent answer well, while the old Needles light was next to useless.—476. None.—478. No.—482. I think the height of a light should depend upon what it is intended for; viz., whether merely a guide for the coast or approximation to danger, also locality of situation.—483. I conceive a light should never exceed 90 or 100 feet above the level of the sea, as higher lights are liable to be obscured in foggy weather.—484. 250 feet.—485. I think a light should not be seen at sea more than 25 miles or less than 15.—486. I never have.—487. I have not formed any opinion, but I have seen Ballycotton Island and the coast for miles, and could not see the light, owing to haze being on top of the island, and I have seen the same with Lundy Island, in the Bristol Channel.—488. 300 feet.—493. 150 feet.—494. I think from 100 to 120 feet in height are the best lights, and oftenest seen with advantage.—495. Probably 250 feet.—496. In different climates or atmospheres different heights would be judicious. In some parts of the United States the higher the better. Cannot give an opinion regarding Great Britain.—499. No.—500. I think this depends upon the formation of the land.

501. Not more than 220 feet.—504. No.—505. Nil.—507. Not more than 80 feet.—510. The lights on Flamborough Head are sometimes capped with clouds and fog when clear below.—511. In clear weather high lights are seen at the greatest distance, while in hazy weather low lights are best distinguished.—512. 200 feet.—514. No.—516. I consider that no light should be above 350 to 400 feet above the level of the sea.—517. 200 feet.—518. I would prefer running for a lightsip to a high light on land, as they are frequently capped by fog.—519. Could not improve those already fixed.—521. 200 feet.—526. The altitude of the lights should depend upon the locality, whether subject to high or low fogs, such as the Stack Rock, near Holyhead, where, when the fog is high, obscuring the principal lights, a lantern is lowered from an inclined plane to the surface of the water, which is seen for a considerable distance.—527. From 180 to 200 feet.—530. The high lights cannot be seen far off in hazy weather. The low ones are the best.—531. I have not. Much depends on the place, as it often happens high land gets capped with fog when it is clear below. This used to happen at the Needles.—533. 90 feet.—535. Perhaps this may be influenced by the formation of the land in the vicinity. Bold land will have a different atmosphere from a swamp.—535. I think 100 feet sufficient.—537. I have formed no opinion.—540. From 100 to 150 feet I believe to be best seen, as a general rule.—541. Can give no opinion.—542. On the coast of the United Kingdom lighthouses should not be very high, as fog frequently covers the hills, and prevents a high light from being seen when a low light could be. I have formed no opinion of the extreme height.—543. I have found, what is generally admitted, that lights placed upon high headlands are often of little use; not that the light is too high, but that fogs frequently collect round such bluffs. On a flat coast I consider that the higher the light is the better.—544. No.—549. No.—551. Shore lights should not stand higher than 100 to 150 feet.—552. Can give no opinion.—553. Formed none.—558. Not possible to form an opinion, as position of coast and local circumstances will cause the height that is proper in one spot to be decidedly incorrect at another.—565. I think, as to the height of lighthouses, and when to be seen, depends more on the state of the weather than on the height of the house, as I have many times seen Lundy low light when I could not see the other, and at the same time they were only 30 feet apart. I have also found the May Island lights in heavy weather. I have seen the Bell Rock light when I could not see the May light, when half way between the two. If the weather is clear, I think the height is of great use, and the sooner the light will be seen. I think these two islands, May Island and Lundy, are a good reference as to the height of lights in different weathers, as both are of great height, and the lower lights are seen when the high ones are not to be seen.—569. No.—571. A light elevated above 150 feet above the water line is not much to be

relied upon, as it is apt to be obscured by vapours floating in the air.—572. About 200 feet.—577. Not above 100 feet.—578. 250 to 300 feet.—579. Lundy, upper, Cape Wrath, South Foreland, high, and Dunnet Head are the highest lights above the level of the sea; but do not recollect ever seeing either capped with fog or cloud; and as the former can be seen 30 miles off in clear weather, I should say from 540 feet, the height of it, to 550 feet, ought not, in my opinion, to be exceeded.—582. The lower that a light can be placed on a bold coast the better. On a low sandy coast 100 to 120 feet high is a very good height.—583. About 70 feet, if no dangers outside, of 4 inches from light.—584. 80 feet, on account of fogs.—585. I think a light ought not to be above 200 feet above the sea level.—589. In my experience the low lights are best seen in thick weather, and that is the time they are most wanted.—591. I have not formed any opinion on the subject.—593. Not to exceed 200 feet.—597. I think all are a good height.—598. South Foreland, highest light.

601. As there has been so much said and written on this subject, I scarcely need venture my opinion. There are times I am aware when a light on a great elevation will be obscured, and lower it might be visible, but I question the frequency of this.—602. 70 to 100 feet, but depends on the part of the coast for the sea breaking over or spray of sea.—604. This, in my opinion, would depend on the position of the lighthouse; fogs will obscure the light if placed too high.—605. No.—506. None.—607. About 250 feet.—609. 150 to 200 feet.—610. About 200 feet.—612. 150 or 160 feet.—613. Not above 300 feet.—614. From 150 to 200 feet.—615. From 250 to 300 feet.—616. 200 to 250 feet.—618. 200 feet is high enough for any light.—621. I think lighthouses over 120 feet for level are apt to be capped with fog, as in the case of Lundy, which would almost require a lower light to be erected.—622. I should be slow to answer this, as I have seen the top of a lighthouse in one description of fog and the base in another.—623. From 100 to 150 feet I think the best.—627. No.—628. 300 feet.—632. No.—636. Lights for coasting purposes should not exceed 100 feet; such lights as the Longships, Dungeness, Snalls, Tuskar, or Hurst Castle lights are more easily discernible in dark rainy weather than those that are higher though more powerful.—637. Certainly not above 490 feet, for at the height of 496 feet the Needles light was found to be very often useful, and, therefore, placed on the rocks.—639. I like the height of the Orfordness lights; the great requisite of a light is, not to see it at a very great distance, but to be able to see it best in hazy weather.—640. Not much above 100 feet.—641. The height above 100 feet is not to be depended on in thick or rainy weather.—642. Do not approve of lights being placed too high; consider from 250 to 300 feet the maximum, according to circumstances.—643. I have not formed the opinion asked.—648. The Lizard lights are a very good height.—649. I know that as a rule I have always seen the lights at Hurst Castle before I could make out that on the Needles Cliff.—651. Yes, I have often found practically that the lighthouses on Hurst beach were not high enough above the sea drift at night, whilst the Needles light on the island was hid by the sea and haze aloft; here the two extremes are given.—652. No.—654. The higher the better.—657. When practicable, I think that no light should be placed at a higher elevation than 100 feet above the level of the sea.—660. Never higher than fifty feet if possible to avoid it.—666. I have not formed any opinion on this subject.—668. I think about 100 feet is as high as I would place a lighthouses in the English Channel, if practicable, as the land is so often capped with fog.—669. In my opinion the Lizard or Start lights are high enough. The light on St. Antonio, Cape de Verd, is high, and is frequently obscured by haze. The Bishop light can be seen a great distance.—671. I think about 240 or 250 feet above the level of the sea where it can be done, as a general rule.—672. Not above 200 feet.—673. Not above 200 feet.—674. To define the exact height which a light should be placed, appears to me to be a most delicate point, but I see no reason why it should exceed 250 feet.—675. I have not; depends on atmosphere.—676. I do not think it should exceed 250 feet.—678. 180 to 200 feet.—679. No.—680. No, but low lights are more to be depended upon than high ones.—683. I consider 230 feet as high as any light should be placed, and as near the shore as possible.—685. I would take the Lizard lights as a standard of the extreme height at which a lighthouse should be placed.—686. 200 feet; 150 feet high is best seen in certain states of the atmosphere, being equally free from clouds above and exhalations below.—687. About 250 feet.—688. Between 300 and 400 feet.—691. Have not formed an opinion, but should not be too high.—692. From 100 to 200 feet.—

694. No, but low lights are more to be depended upon than high ones.—695. A range of 20 miles visible on the horizon is high enough, and any greater elevation renders them liable to obscurity from fog.—697. Cannot say.—698. No.—699. I think from 80 to 100 feet is a good height, but it depends on the character of its neighbourhood.—700. No light should be above 230 feet.

704. Should not exceed 200 feet.—705. On low land the higher the light the better, but on high land the light should not be placed too high, if a convenient place lower down can be found, on account of fogs and mists generally hanging about high land.—707. Much depends on locality, but, generally speaking, for harbours, say from 50 to 60 feet.—709. I have not.—715. I am hardly competent to give an opinion, but think it should not exceed 180 feet.—718. I have formed no opinion.—721. High lights are often obscure when lights of moderate height are seen; Hurst light is a good criterion as to height; leading marks through for the Needles.—722. 200 feet.—724. 20 feet from high water to the base.—726. The height of the lighthouse at Cape Barreir.—728. I have found that high island or coast lights are not visible when at all hazy.—729. I imagine, about 450 feet.—730. This should depend on the situation of the lights, and what they are intended for. Those which are placed in positions where vessels make the land, or that might be a guide for shoals at a long distance, should not be less than 200 feet high, except that they are more liable to be obscured by fogs at that height.—732. Sixty feet.—733. At about 150 feet generally; but higher, if not subject to foggy or hazy weather.—736. This depends upon the state of the atmosphere.—737. About 200 feet.—738. It is very difficult to answer this question, as sometimes low lights are seen before high ones.—747. No, as I think it depends on the locality. I have often gone in and out of Havre without seeing the Le Heve light, although I have seen the pier-head light, and the lights of the vessels in the roads, the fog, in some cases, reaching half-way down the cliffs. The St. Catherine's light, Isle of Wight, is often eclipsed, I believe from the same case.—749. One hundred and fifty feet.—751. No light, in my opinion, should be higher than from 150 to 200 feet.—754. I have not given the subject much thought, but it has sometimes occurred to me that Cape Wrath was placed at a very judicious height.—755. If the coast is high, have the lights low; if the coast is low, have the lights high.—756. Formed none.—758. Three hundred feet.—759. In my opinion, not above 200 feet, as above that it is subject to be capped by fog in hazy weather.—760. I am of opinion that 220 feet should not be exceeded, if circumstances would permit, as low lights are always best seen in thick or hazy weather.—761. Loop-head, on the Shannon (raised, I believe, 269 feet), appeared to be as near as possible to perfection.—762. I have not formed an opinion.—763. I should say, 140 feet.—765. Where practicable, not higher than 200 feet.—770. I think no light ought to be above 200 feet, if possible to avoid it. It would then give quite sufficient range, and less liable to be obscured by mists.—772. The height of lighthouses depends, in my opinion, on the locality. I was always of opinion the Needles light was too high, and more frequently enveloped in fog than any other I know.—773. I think about 120 feet above the level of high water the best height for lights in the Channel.—777. I think no lights should exceed 250 feet above the level of the sea. I have always placed more dependence on seeing a light in all weathers that was under 200 feet than those above 200.—782. About 200 feet.—783. Not higher than 200 feet.

21. Can you suggest any improvement in the position, height, nature, colour, or means of identification of any Lighthouses, Floating Lights, Buoys, or Beacons in the United Kingdom?—if so, suggest the improvement, and give your reasons.

1. Not any.
2. A red shade in the North Foreland light to strike the east buoy of Margate Sand would much facilitate the navigation at the entrance of Queen's Channel.
3. There is one, and that is, the removal of the Gull lightship, about three-quarters of a mile further to the southward and westward, nearly midway of where she now is and the Bunt Spit buoy; the reason for

- which is as follows:—In proceeding for the river in times of southerly gales and rainy weather, a vessel might approach the South Brake buoy with the certainty of making the Gull light, a bearing of which would place the ship fairly in the Gull Stream, thereby saving (what is now frequently the case) the necessity of sinking an anchor in an open roadstead.
5. No.—6. No.
7. No. I think they are sufficiently distinguished from one another, and may, in all cases, be safely used with the commonest caution.
8. Recommend striped lighthouses, beacons, and buoys; lateral stripes, black and white or red and white.
9. The buoy off the Manacles floats so deep that it is difficult to be seen. Requires a beacon on top, or made higher. The beacon on Wolf and Rundstone is continually being carried away. Consider stone buildings better to be seen, and less liable to accident.
10. I think all lighthouses should be painted white, with red ring (or stripe horizontal) round them.
13. The iron beacon on the Swilly Rocks, Longh Swilly, is not sufficiently conspicuous, and the same is the case with that on Black Rock in Galway Bay. A small solid tower is much better adapted to such situations as required to be made out at some distance off, while iron beacons, presenting only a small surface to the eye, are only fit for narrow channels and close navigation.
14. I cannot suggest any improvement, as I think the present very good.
17. None.
18. Where the land is low, where the lighthouses stand as beacons in the day, such as the Tay lights, I would recommend a black stripe down in front of the house, as it would be seen much better when snow is on the ground, or in rainy weather, or in hazy weather in summer.
20. I have found black buoys could be seen best at night, and that red is a good colour to distinguish lightvessels by day.
21. No.—22. None.—23. Not any.—24. Not any.—25. Not any.
26. I cannot suggest any improvement.
27. No.—28. Not any.—29. None.—30. None.
31. No. In my opinion the present position, heights, and colours are well adapted to their locality.
33. None.
34. I suggest that a large black nun buoy be placed on the Noman Bank instead of the present white one, which cannot be seen in the night.
38. No.
39. The Needles to be a flashing light, as the red light is so faint vessels generally keep so far northward to make it of the natural colour that it sometimes endangers their safety. Had it not been a red light, probably the *William Singer* and *Tyne* steam ship would not have grounded.
40. Refer to the 19th Question.
41. I think the beacon on the Carr Rock off Fife Ness ought to be enlarged, and I think that all beacons should be of a red colour.
42. No.—46. Not any.—49. Not any.—50. No.—52. No.
54. They should be painted in red and white stripes, being better to distinguish in foggy weather.
55. I cannot see a white buoy at any distance, night or day, comparatively speaking.
57. No.—59. No.—60. Not any.
61. I believe that white lighthouses are bad to distinguish, and think our floating lights are as well red as any colour in which you can have them.
63. No.—65. No.
66. Refer to the 19th Question.
68. No.—69. None whatever.
70. Refer to the 19th Question.
71. Not any.—72. No.
73. The present system is good, there should be no alteration.
74. No.—75. None.—76. No.—79. Not any.
92. Larger buoy South-west Shingle; black at the Noman, with staff.
84. I cannot.—86. I cannot.—87. No.—90. No.
91. (*Answer to Q. 21 and 22.*) The masking or distinguishing by colour of the lights of Buchan Ness and Kinnaird on the Aberdeenshire coast (Admiralty chart 1,409) upon such a bearing as will guide clear of the reef off Rattray Head; as at present this and other dangers the mariner is exposed to by night, the lights being clear three miles within the head without an object or a cause. The removal of the lighthouse on the north end of Islay Sound, and the discontinuance of a similar erection in progress at the southern entrance, because, 1st, a light in a central position would be far more advantageous for local navigation and for general purposes in connexion therewith; other positions would be more favourable. 2dly, because the arrangement of colour, as shown from the north light-house, is directly opposed to a recognized universal principle for signaling by colour, both on shore and afloat, and from which in this case there is no necessity to depart for the reason which I have heard assigned (viz., that the red light would not be distinct enough to indicate caution at sufficient distance off the dangers), as they lay but half the distance off the light that some of our red lights are supposed to be seen from. 3dly, because the bearing upon which a vessel would pass from one colour to the other is far more likely to result in fatal consequences than in extrication from doubt and difficulty. 4thly, because by the erection of the lighthouse at the north extreme of the sound, a second became necessary at the south, distance about nine miles, thus more than doubling the necessary expense, without affording the local advantages of the central light, obstructing a more advantageous general arrangement, and rendering difficult a decided and unmistakable distinction between lights so little distance apart as they will be, should the present arrangements be carried out. I also recommend increasing the power of the present red light of Port Ellen, Islay, it being but a single reflector, but of great general benefit.
92. No.
93. A good bell buoy on Breaksea Point would be an improvement. The number of ships stranded there shows the want of it.
94. I think it would be an improvement if Tuskar was now distinguished by two revolving lights, one some feet above the other, both appearing at the same time and going out at the same time. This would afford means of distinguishing Tuskar from the revolving light now placed at the Blackwater Bank.
97. No, none.—100. No.
103. I decidedly approve of the form and construction of Herbert's buoy, it retaining its perpendicularity when subject to the action of strong winds, tides, and sea, consequently visible at a greater distance.
104. The Fairway is much behind in being lighted; I can see no reason why that channel should not be as safe as the Humber.
106. No.—107. No.—108. No.—112. No.—114. No.—115. No.
116. See Question 9. At the north-west lightship, Liverpool, one continual blue light as long as there is water.
117. Bell on the Manacles buoy for fog.
118. No.—119. No.—120. I cannot.
121. I know some lights, such as that on the Mall of Cantyre, and the island Devon, where I would consider it an improvement to have the lighthouse painted red and white striped, so as they would be better seen through a fog.
123. I cannot.—124. No.
125. Bright red light the best, because seen at the greatest distance. In my opinion, at the Manacles, a bell placed on the buoy would be of essential service in a fog.
126. No.—127. No.—128. No; I cannot.
129. See Clause 16.
131. Double lights, bright and coloured, to all beacon and floating lights when fixed.
133. All buoys as marks should be conical, farthest seen, not so good a resting place for birds. Ask officers of Trinity yachts.
134. I cannot.—135. No.—136. None.—138. No.
139. See Number 16.
140. None.—141. No.—142. No.
145. I believe that the revolving light on the Blackwater Bank lightvessel has been and will be mistaken for Tuskar light, which is revolving.
149. Cannot.
150. To define the same in a clear and distinct manner would require a greater space, therefore, not to be misunderstood, I decline, for those reasons only.
161. Bardsey should be more brilliant.
162. No.
163. A light at Blacktail for the above reasons, and at the Humber for ships entering.
167. No.—170. No.—172. No.—174. No.
180. At present I cannot.
181. Answered in No. 9.
185. I must leave that to the coasters.
196. Donaghdu should show red to the southward in a range of one mile to eastward of Skulmarten Rock

- and in shore St. John's Point. Should show a bright fixed light from the same tower, for strangers make mistakes, taking for the north and south, and shaping their course north, go on shore.
198. Cannot suggest any improvement.
203. No.
212. I approve of lighthouses coloured white.
213. The lights on Mull of Galloway and Mull of Cantyre are frequently obscured by the fog or haze hanging over the high land in the background; these lights would be more useful if placed nearer the shore.
220. Where there is liability to mistake, I would suggest that lighthouses be painted with two most remarkable colours, perpendicular on the four quarters of the round, and lightships painted from the bows to the midships with one colour, and from the midships to the stem with another colour; by this means I think they would be more easily distinguished from one another by day by varying the colours of different spars, &c.
224. No.
228. No; but it is desirable to have as much distinctiveness as possible between lights and lighthouses, particularly that strangers may know the latter—too much sameness in ours, they should be all or any shapes. This contrast in this respect in the lighthouses of the Gulf of Finland is superior to ours, as a chart will show the peculiarity of the navigation made this necessary.
229. No.—231. No.
234. I am not aware of any improvement otherwise than what they are at present—lightships red and lighthouses on the coast white.
235. Approaching Orfordness from the north-east it is very difficult to distinguish between the high and low light; have frequently thought them open one way when they have been the reverse, and think many ships have struck on Sizewell Bank in consequence of this. If either light was shaded red when open inwards it would be a great advantage.
237. When I was a sea-going shipmaster I was not aware of two lights in one bearing alike on our north coast, therefore the arrangement is good.
242. No.
244. Should suggest the Mouse lightship, West Swin, to be a red light, on account of ships riding round and near her.
247. I cannot.
248. I think a staff and ball on the Noman's Land buoy would be an improvement, as the broken water on the shoal prevents it being seen at a distance.
250. Lighthouses, if above the land; white is the best colour under cliffs; dark red colour floating lights, buoys, and beacons; black and red is the best to see at a distance.
252. I consider a large red or black buoy with staff and ball on the Noman to be very desirable, as the sea over the bank in stormy weather prevents the white buoy from being seen.
256. No.
258. St. John's Port and South Rock (Irish), and Mull of Galloway (Scotch) lights, have been often mistaken for each other, being nearly in a line. Make South Rock to flash quickly. Ardrossan lights should be open all along the coast, and not merely as a harbour light, being open only for a few points. Make steady light on Blackwater Irish ship very powerful, that it may be seen as far as the revolving light.
260. A bell buoy to the north-north-east of St. Ives stones.
262. The Hook light and Saltees lightvessels' lights are very similar in appearance and bearing and distance to the Smalls and St. Ann's lights. Ships have often mistaken the one for the other; I had once a narrow escape. Supposing we were running between Grassholm and Skomar, we were between the Hook and Saltees lightship. There should be something to distinguish between the Smalls and Hook lights.
263. None.—264. None.—269. No.—270. No.—272. None.
274. I think the light on Lundy ought to be on the extreme northern point of the isle, at an elevation of about 120 feet; for reasons of such a change, read answer to No. 20.
275. No.—276. No.—278. No.
280. Would prefer Dungeness lighthouse white.
281. No.
282. The west lighthouse on Mishowen Head should be raised; the lights in one clear the Tuns; but from their being of the same elevation it is a very hard matter to keep them in one, for you cannot tell on which side the line of direction you are. It is doubtful if (from its proximity to the Tuskar) the Blackwater lightvessel should bear a revolving light; it would probably be more distinctive if the Arklow lightvessel bore the revolving and the Blackwater a fixed light.
283. White lighthouses with black rings and red lightships are the most conspicuous.
284. See answer to 19 and 20.
285. White, when seen against land for distant observation; floating lightships red, as in use; where uncertainty of points of land is likely to occur, party colour, either circular or striped, for distinction.
288. I cannot suggest any improvements.
292. I cannot; I consider both lighthouses and lightvessels as they are, easily identified one from the other, or from any other objects.
301. No.
302. Fixed and flashing are the best and most simple; avoid coloured lights except for tidal.
303. Nothing particular to suggest.
309. Not any.—313. No.
314. Lights on board of lightvessels revolve too quick; if more time was given it would be much better in bad weather, as they might be better identified.
315. I cannot.
316. White lighthouses can be seen at the greatest distance.
319. No.—322. No.—323. No.—324. No.—329. I cannot.—332. No.—334. No.—336. No.
339. I would colour the Hook Tower in stripes vertical, or any way different from altogether white.
347. No.
348. The adoption of one colour to indicate starboard, and the adoption of another to indicate port, in the position of beacon buoys; in all cases where placed, certainty would then take the place of uncertainty when the above suggestion is not adopted.
349. Portland lights not seen far enough off.
350. I cannot.—353. None.—354. Cannot suggest any improvement.—355. No.—356. No.
358. I think the Dudgeon, and lights similarly situated, ought to have another light to revolve for to distinguish them.
361. None.—363. No.
364. All lighthouses and lightships in the same channel painted differently.
368. Some plan should be adopted to enable us to know when we are clear of the stones lying off Godrevy Island; the flashes of light are so brilliant as to deceive us passing in and out St. Ives Bay.
370. The Mull of Galloway, Wigtownshire, ought to be two lights,—one on the east and one on the west; the present one is far too high.
371. Some plan should be adopted to enable us to know when we are clear of stones lying off Godrevy Island; the flashes of light are so brilliant as to deceive us passing in and out St. Ives Bay.
372. The red light at the Tongue (entrance of Priam Channel) should be higher and of greater brilliancy.
373. The brilliancy of Winterton improved, and the Cockle floating light placed on a line with the north end of the Cross Sand would prevent many a blunder and accident caused by ships hauling up or keeping away to the south-south-west and south-west before they should do so.
375. Cork Harbour light, a bright flash every minute (too dull at present), and continue red.
377. No reply.
378. The Holms light being fixed, it cannot be distinguished from the many ships' lights riding near it.
386. No.
388. For Stornaway harbour I would place an oblong light along with the light at the remote end, to show the channel into the harbour.
389. I would suggest that, in addition to the present red light at Pakefield, that a green or bright light be shown, either all round, or immediately on losing sight of the red light on both sides.
390. Lighthouses should be simple towers, with as few other buildings about them as possible; if prominent above the land, a dark colour is more conspicuous; but when there is a background as seen from the sea, white is the best colour.
392. A black nun buoy on the south-west of Shingles instead of the present bell buoy.
393. Any dark colour I find is best.
394. I would suggest that a red light so arranged on the Longships lighthouse that it would show when a ship was standing too near the Rundlestone to the southward and the Brissoms to the northward. Likewise, the light on St. Anthony Point, Falmouth, to have a red shaded light to open when going too close to

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- the Manacles, as any vessel's compass may vary a little and not give a correct bearing.
396. No better than red.
397. No.
398. The Blackwater lightship revolving light changed from red to blue, so as to make a distinction between it and the Tuskar red revolving light.
399. I have always found red best discerned the farthest.
401. Yes; many might be more or less improved, however good at present; but this is too large a question to be answered in a few words.
402. No.—405. None.—406. No.—410. No.
414. Lighthouses ought to have distinguishing paint white, horizontal, vertical, and red.
418. No.—420. No.—427. No.—429. No.
431. I believe that large black horizontal stripes on the Tuskar lighthouse would be of great service to masters of vessels coming into the first or St. George's Channel to distinguish it from others.
433. The Coal Rock, if enlarged, and a bell added, the latter would warn when in the locality on dark nights.
434. No.—440. No.—445. No.—449. None.—451. No.—461. No.
462. Would suggest that a more prominent light in the neighbourhood of the Coningy Rock be established in the coast of Ireland, it being a sharp turn for ships bound up the St. George's Channel, requiring great caution with southerly winds.
472. No.
474. I would suggest the light on St. Anthony's Point, at the entrance of Falmouth Harbour, placed or raised so as to be of use when approaching from the eastward, and to be coloured or tubed on the line clear of Manacles.
475. Yes; lights visible 20 to 25 miles off should have a distinguishing light at, say 10', upon the principle of Lundy Island lights.
476. No.—478. No.
482. They are so wisely and systematically arranged that I find no trouble to identify any light in the United Kingdom with care and prudence.
483. I cannot.
484. Blackwater should be red, triangular, or flash; two revolving lights are in its immediate vicinity.
485. White, distinguished by black marks, circles, balls, or pillars.
486. A better light on Saltees, as I often make my landfall about there.
487. The lights named in No. 20 as to height if it can be done. I should suggest that Bardscy Island light should be stronger, and also the Smalls.
488. I would recommend that the Blackwater Bank light be changed from a revolving light to a triangular.
489. Reason:—the Board of Trade require steamers to use a bright masthead light; and sailing ships use at times, in addition to the red and green, a bright light, which renders it difficult to distinguish the float lights of same colour.
494. I do not know of any.
495. See Question 26.
496. No.
499. As to colour, lighthouses would be better a brighter red, when red, and white and black to some others, so as to be easily identified during the day.
500. I consider the removing of the light from Cape Clear to the Fastnet Rock an improvement, being a mile to the westward of the Cape.
501. I believe all lighthouses near the shores should be painted two colours, I would recommend red and white, belts or rings.
502. Think Cork Harbour light may be improved by a more brilliant red.
505. Nil.—509. No.—510. No.
511. In leading lights, such as Hasborough, Orfordness, I would recommend one light bright, the other coloured, with building to correspond.
512. I cannot suggest any better plan.
514. No.—516. No.
517. Lighthouses painted in black and white stripes are best seen in fog, white being a bad colour for either houses or buoys.
518. I know of none.
519. None.
524. Let some lighthouses be striped perpendicularly with black; others, horizontally; and others again, white. I was the other day on the coast of France, and could not tell in a fog my position, because all their lighthouses are painted alike.
527. I cannot suggest any.
530. I consider the present colour good; that is, the houses white, and ships red.
531. Not any.
533. I know black beacon buoys to be the best at night, by experience.
536. I cannot.
537. I would suggest a change in the lights at Stornoway and Port Ellen, Islay. Stornoway, the flash is at least too short by half, and Port Ellen is too weak; both are of little service in thick and bad weather.
541. None.—542. I cannot.—544. No.
545. I can suggest no improvement.
549. No.
552. Unless one of the lights could flash with red or green.
553. At no time.—554. No.
556. See Nos. 13 and 23 as to size.
557. I think it would be an improvement if the St. Catherine's light were made to revolve. In the clearing up of thick weather it may be mistaken for the Owers light.
558. If the Owers had two lights, different heights, and the upper one red, and the Nab made a red revolving light, it would be easier to distinguish your position in thick weather, with many vessels about.
565. I suggest that a great improvement would be made in the Gull Stream lightship if one of the lights were to revolve, as it would always point out her station in the night; as the large number of ships at anchor on the Down's end of the Gull Stream, with so many lights, and some of them so bright, that it is almost impossible to make out the Gull Stream light, for at a distance it appears as one light. It would also be of great use for ships outside of the Goodwin Sands, as many Hamburg and Bremen captains, there, have taken the Gull Stream light for the South Sand head light, and almost got on shore before they found out their mistake, as the Gull Stream lights show as one at that distance. If one of the lights were to revolve it would be one of the greatest improvements that ever was made about the Downs. I have been coming into the Downs in the night when there were 300 or more ships at anchor there, and I was obliged to come to an anchor, as I could not make out the Gulf light from the ships at anchor. If one of the lights had revolved I could have gone on with safety.
567. None, without it be the middle light in the Rings Channel, or East Swin, say the light or mast to be 10 feet higher.
569. No.—577. None.—578. No.
579. (See *Appendix to Mariners' Evidence*, p. 579.)
585. I think there should be some alteration in the Tuskar or Blackwater lightship, as without great care one may be mistaken for the other, as the fixed light on the ship, or the red light on Tuskar, are not to be seen on a thick rainy night until close-to.
586. Small lights to be changed. Better to have two lights, one above the other.
589. Flashing and fixed light to be preferred.
591. I have no opinion to offer.
593. The colour of lighthouses, cream colour, and on buoys or beacons the same, with white stripes, is best seen in all weathers.
594. I should suggest a red and green light at the entrance of Ferry Harbour to be different from any other in the Channel, and to be so constructed to clear the Cannes Rock by night.
597. None.
598. (Answer to Questions 21 and 22.) I am of opinion that Beachy light (if the formation of the land will admit of it) would be in a better position on the head itself than at Belletout, so that it might be seen in coming from the eastward in a line with Dungeness, as well as in coming from the westward, because, as the light is now situated, there is no guide for clearing the Sovereign shoals except bringing the light open; and, therefore, the cautious navigator, after losing sight of Dungeness light, keeps well to the southward, so as to be sure of bringing Beachy light open before he gets too near the shoals, and when he sees the light he will, perhaps, be several miles further to the southward than there is any necessity for. This, if bound into Spithead with northerly winds, might lose him a tide. On the other hand, if, from an anxiety to keep to windward as much as possible, a ship should be a mile or two nearer the shore and further to the westward than expected, she might strike on the Sovereign shoal without seeing the light at all; whereas, if the light could be seen from the eastward

- as well as from the westward, the first bearing taken of it would show whether the ship was in a proper direction or not. But a more serious evil is, that a light so situated leads to a careless manner of navigating by neglecting the compass, and many an incautious navigator bound up Channel, so that the light be kept open, taking it all right, and will not take the trouble of thinking a bearing at all; the consequence is, that with an ebb tide the ship may be set more to the southward than thought for, and may not this in some measure account for the fearful wrecks which so often occur near Boulogne? If a compass-bearing of the light had to be depended upon for keeping clear of the Sovereign shoal, it would involve a frequent application to the compass, by which means the ship's drift would be discovered in time to prevent danger.
601. I would like to see Tuskar lighthouse painted all red, it would be seen much sooner in smoky, hazy weather.
603. I would suggest all lighthouses on shore, white, as best to be seen on land.
604. I would not suggest any improvement.
605. I think lighthouses painted red and white in broad horizontal bands might be used advantageously here and there, as easily made out in foggy weather.
606. No.
607. Crosby shore light is very indistinct, and is often hid by the haze of prevailing southerly winds.
608. Crosby lighthouse should be brought down to low-water mark, as, owing to the haze on the low marshy land, the light which is red is often obscured. Point Lynns light should mask sooner to the southward for the Dulias Rocks.
609. Crosby lighthouse should be higher and the light brighter. The buoys of important channels should in general be larger, like those in Queen's Channel, which are at all times remarkably distinct to the eye.
610. I think if the Crosby lighthouse and Formby lightship were to change lights it would be an improvement, so that the red light should be the nearest of the two coming into port. Larger buoys, like those in Queen's Channel, may be advantageously used in Beaumaris River.
611. Crosby shore light should be improved, or should change lights with the Formby light ship.
612. Crosby shore light should be improved either by raising it or by bringing it down to low-water mark (one and a half miles seaward), as in hazy weather it is totally obscured. If a light vessel was substituted for the bell buoy, then the Formby lightvessel and Crosby lighthouse might change lights to advantage. Point Lynns light should mask a little sooner for Dulias Rocks. Large buoys should be brought into more general use in all principal channels.
613. I would suggest that outlying buoys, such as the south-east Princep, Elbow buoy of the Dean, south-east buoy of the Dean, and other buoys of the same importance, have belts of reflectors of stout plate glass well protected from damp by being set in metal frames with india rubber placed on them. The slightest light falling on them is seen directly. I have seen vessels' positions, by having reflectors at their mast-head vanes, a distance of some two or three miles at night by the rays of the moon falling on the reflector. I think it would be worth a trial.
614. Crosby shore light should be more powerful; West Hoyle buoy should be black instead of white; Bidston light should be brighter.
615. Crosby lighthouse should be higher so as to appear above the fog, which often lies on the sand hills. The light is also very indistinct, being red and on a level with the sand hills. Bidston light being of great importance might be made more brilliant.
616. If Crosby lighthouse were higher it would be better, or if brought down to low-water mark, on account of the fogs on the Crosby land. The light is very indistinct. West Hoyle buoy should be black and larger. Bidston light is good, but cannot be too good.
618. I think that a pile lighthouse on Taylor's Bank, or low-water mark of Formby beach, should be substituted for Crosby lighthouse, as it is often obscured by fog when south winds prevail. West Hoyle buoy should be larger, and painted black instead of white. Bidston light is good, but, as it is of so much importance, it should be more brilliant.
621. Explained in Question 20.
622. Point of Ayr light, at the mouth of the Dee, is often taken for the North-west ship. To make it a flash light would be a great improvement.
627. Uniformity is very important. Floating lightships coloured red, it being a colour seldom, if ever, used by vessels of any class.
636. The Gull light to have one light placed higher than the other. The lights at present exhibited are at the same altitude, one of the foremast and the other on the mainmast, and as the vessel is for the most part either swung to the north-east or south-west, consequently these lights appear as one light to a ship approaching, calculated to mislead, especially when a number of ships are riding in the Downs with lights up in dark weather. The Casket lights are curious, standing in the form of a triangle, though at equal heights from the sea; when they bear S.W. by W., or S.E. by E, two of the lighthouses are in line, and only two of the lights are seen; sometimes they have a very extraordinary appearance, revolving every 15 seconds at irregular intervals, for at times you see all three lights, then two, and again only one, as the machinery goes faster in one light than in the other, resembling something burning on shore, or a fisherman's flareup with bright and fitful glare. St. Anthony's light Falmouth Harbour, should show red when westward of a line touching the Manacle Rocks, to enable steamers and others to avoid those rocks by night; also the Longships in a S.E. direction touching the Rundlestone, should show red when on that bearing, to enable steamers and other vessels to avoid that rock with more certainty at night.
639. No.
640. Larger buoys should be more generally used.
641. I suggest a quicker flash for revolving lights generally, so as to remove doubts as to the fixedness of the light, which often occurs when it can only be occasionally seen.
642. Consider that white buoys to mark the entrance of a channel or sand bank, the most difficult to make.
643. No.—644. No.
651. This is a very extensive question, and would comprehend almost everything. I found many gentlemen of the Trinity House Light Committee very intelligent and clear headed on these matters.
652. No.
654. Red is a good colour.
657. No.—658. No.—660. No.
666. I cannot suggest any better colours than at present.
668. No.—671. No.
672. Buoys should black on one hand of a channel and red on the other, but differing in shape for identification at night, say, black, nun buoys; red, can buoys.
673. Black nun buoys on one side of a channel and red can buoys on the other side.
674. No.—675. No.—676. No.
678. I would prefer lighthouses to be chequered black or red and white, being seen furthest in misty weather, and white buoys being seen at so short a distance, particularly in misty weather. I would prefer any other colour if practicable.
679. No.
680. A lower light at the Lizard and at Beachy Head would be an improvement, as the present lights are frequently enveloped in mist, when the atmosphere is clear below.
683. No.
685. I can suggest no improvement on the present system without so many complications in description, that serious errors would arise.
687. Dungeness light would be easier identified if a second light was placed directly under the present one, so that two bright lights be seen perpendicular, it could not then be mistaken for a ship's light; also the Owers lightvessel, if she had three masts instead of one, could not be mistaken in thick weather.
688. None; the bright lights the best.
691. Bidston light should be a better one.
692. Floating lights by having them different colours, more distinguishable by having them so.
693. In coming up and down the Channel, Dungeness light is frequently mistaken for a fisherman's light, and I would suggest that a flash light would be an improvement, similar to Point Lynas, near Liverpool.
694. A low light at Beachy Head and the Lizard, I think, would be an improvement, as the present lights are frequently enveloped in mists when it is clear below.
695. Think the Owers and Nab lightvessels should be painted differently, as coming suddenly on either in a fog, they might in the hurry be mistaken for each other.
697. I think if more yellow was used that buoys could be seen much better by day when wind is high, &c.

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698. No.—700. No.

702. As the South Sand Head light is often taken for a vessel's light, I would recommend a more powerful light (bright) with a red or green light adjacent to it.

704. No.

705. Lighthouses on low land would be better coloured red if situated like Dungeness with no interruption from bessel ground; where a back ground would lessen the contrast, white is better than red. There should be no buoys coloured all white, as they are difficult to see where the water is broken. Example, the Gull buoy cannot be seen by a ship from the northward so soon as the North Bar black buoy, which is at greater distance. All buoys should be spiral, flat top buoys do not show sufficiently out of water, especially at high tide.

707. No.

708. No buoy ought to be painted white, cannot be seen near broken water.

709. I cannot.

714. The blue signal light in the North-west lightship at Liverpool to be burned every hour in winter in room of every two hours as at present.

715. I think the lights on the Skilligs Rocks improperly placed, it should be a single light on the Foze Rock, as that is a low and dangerous one; besides which, the Foze is the turning point where vessels alter their course going north or south.

718. I have formed no opinion.

721. The bright and red lights.

722. Not any to my knowledge.

723. The fog gun on Holyhead mountain is not well placed, it is too high, and the sound interrupted by the mountain in certain directions; it should be removed to the Stack Rock or to the North Stack.

726. The Owers light ought to be distinguished from that at St. Katherine Point. Both are single fixed lights. Also St. John's Point light from the South Rock, north-east coast of Ireland. Both are single revolving lights, within 12 miles.

729. No.

730. I think there might be improvements in all these points. 1st. The position; it might cause mistakes to alter some lights, but such as Beachy Head might be altered safely to guide ships clear of the shoals to the eastward; at present it is only seen close to shore from the westward, where there are no shoals to avoid. 2d. The height; there are several lights which might have been a guide for dangerous shoals, if they had been made a few feet higher.

733. No.

734. The Dean tail buoy to be changed to a beacon buoy, to distinguish it from the other buoys on the Dean.

737. Crosby light (shore light) should be improved, because it is often obscured by the haze rising from the marsh in which the lighthouse stands.

738. The high light at Orfordness is scarcely visible at times.

745. I think the lighthouses might be painted different colours, and built different shapes from each other, so that in hazy weather they might be the more easily recognized.

747. I think lighthouses might be painted so as to be easily identified, by day, by varying the colours; for example, perpendicular black and white stripes, horizontal black and white stripes; all black, or all white, in cases of round towers. Square towers might be painted in diamonds, or round spots, or chequered on the squares of the towers, black on a white ground, or white on a black ground.

750. The South Rock and St. John's lights, on north-east coast of Ireland, are with revolving lights, not easily distinguished in thick weather.

751. The Kish lightship: three lights appear in one at times, and the shore light on Howth (Bailey) like it; find often in easterly gales a great difficulty in distinguishing them until very close, and often in doubt as to position.

754. I cannot.—755. No.—756. None.

760. I am of opinion that there should be a change from the uniform lights on the Northwest lightship, and also the North Sand Head (Goodwin Sands), or on any floating lightship with more than one light, as they would be better distinguished.

761. Tuskar light has been represented so high as to be seen over the land of Carnsore, which rises in parts only to 80 feet. It might be better to equalize it by

masonwork, rather than lower Tuscar. Beacons might be of stone. See sketch.

762. Not competent to judge.

763. No.

765. I would suggest that Crosby shore light (red) be made more brilliant, or the tower removed to low-water mark, because 9 months out of 12 the state of the atmosphere is such as to obscure it in its present position on low marshy land.

769. I suggest that Kingstown revolving light be discontinued; a red and blue on each pier-head instead; the one removed to be taken and placed on the Bailey, which would be then a revolving light, and is now a fixed light. This improvement I have laid before Sir James Dumbane, head of the Ballast Board, Dublin. My reason is this: Supposing the wind is in an easterly direction, and thick hazy weather, blowing hard, vessels running for Kingstown or Dublin, in the night, suppose they make the Kish lightship before they make the Bailey light, the Kish will of course appear as one fixed light, the ship will be riding head on to it. I have personally known four colliers to have mistaken these lights, and hauled their wind to the southward, then judging themselves to be looking at the Bailey, instead of the Kish lightship, in a few moments these ships were hard and fast on the Kish Bank, and few left to tell the tale. As the Bailey is at present a fixed light, and the Kish lightship is a fixed light, as with two white lights which open as one, with the wind at N.E. to S.E., this is why I suggest the Bailey to be a revolving light. Sir James Dumbane persuaded me that he would look into the matter as soon as the reflective light was completed. I have had much experience between Holyhead and Kingstown, when in command of the *Scotia* express steamer. A revolving light is of no use on Kingstown pier; red and green is wanted only. This, I trust, you will understand me. I consider the Blackwater lightship is a dangerous light where it is placed. I find it will take great presence of mind to tell the difference between it and the Tuskar light, both lights being so close together. The revolutions of the Blackwater lightship being so slow in a heavy sea you are liable to miss a revolution; if so, that will make you apt to believe that it is Tuskar light. From what I have seen myself, I have little doubt but the ship *Pomona* made that mistake. I do not doubt but they did.

772. I can suggest no improvement.

773. None, except that of numbering with paint every lighthouse or vessel to correspond with an official list. Buoys and beacons by letters, or a letter and figure combined, having reference to an official list.

775. I think the Buttunness light (River Tay) would be improved by elevating the high light a few feet more, as it is often difficult to tell whether they are open to the eastward or westward. The Bell Rock lighthouse should be coloured red, or red and black, if it was judged necessary to distinguish it from the Longstone.

777. I do not remember any at present.

778. Inshoven west light to be raised, because it is used as a leading mark. Our lighthouses are almost in variably white when remote from hills or other background; they would be more conspicuous, in hazy weather, if black or red.

783. Trwyn Du light, Beaumaris, and Walney tide light should be improved, because they are not distinct enough. Crosby shore light should be brought down to the beach, because it is now on swampy land, which creates mist and obscures it. The light should be brighter.

784. That the buoy on the One Fathom Bank, near the Holmes, in the Bristol Channel, be a bell buoy to intimate to vessels their exact position in thick weather.

786. I think the Bell Rock lighthouse would be better seen coloured red.

787. A stranger running down, as I was, from the northward towards Newcastle, cannot distinguish the Longstones from Coquet Island in very thick weather by directions.

789. Queenstown, Roches light (seaward light, red,) is a bad one, and not to be seen far off under favourable circumstances. I should recommend two bright lights; lighthouse now built to remain, and to have a second erected on the ground at the back, and placed so as to show two lights, when outside the Vent Rock. The buoy placed near this rock is often washed away. Crookhaven,—the lighthouse is on the starboard hand

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of the entrance to the harbour, when it should be on the port, on the Alderman's Rock, or the nearest point to it, the result is, that when the harbour ought to be of use to vessels in distress, and the master a stranger to the port, in bearing up for this snug little harbour is wrecked, because when he opens the light he steers for it; and, being ignorant of the entrance, goes on the Alderman Rock. I think a green light best for this harbour.

790. I would suggest a change in the Longships light, which is a very inferior light for such a thoroughfare, and so many vessels passing during a long winter's night, and considering the dangerous rocks which surround the neighbourhood. I have been passing the Land's End to Bordeaux for nearly four years, making nearly two voyages per month, and on a dark night when there are many vessels showing bright lights, which a great many still continue to do, it is difficult to know which is the ship and which is the Longships, more especially when the ship is steering the same course as myself, or the opposite course, for in such cases we should not alter the bearing of each other until we got nearly abreast. I have been coming from the southward, steering for the Longships, and the wind being south-west or west (which winds prevail in that neighbourhood, I should think, eight or nine months in the year), and the weather dull, attended with showers of rain, and have been to the northward of the Wolf Rock before I have seen the Longships light. Now I think it would be an improvement if there were a red revolving light (of a deep colour) placed on the mainland inside the Longships, of sufficient height and brilliancy to be seen over Mounts Bay, so that vessels crossing the channel from the southward, and having been carried up the English Channel by the flood tide, which is often the case, as they have to steer a very fine course, being afraid of coming in contact with the Wolf Rock, consequently they get into Mounts Bay, and do not see the Longships light at all, having shut it in with the land; or place it on the mainland inside the Rundlestone, and let it revolve, say every three minutes, so as not to be mistaken for St. Agnes, which is the nearest revolving light to it. Instead of darkening that side of the Longships light, now showing to the eastward of the Rundlestone, which is very useful to vessels that should happen to be a little to the eastward of their course in coming across from Ushant to the Land's End, for any shipmaster may easily know by a single bearing of the light, if he sees it, whether he is to the eastward of the Rundlestone or not. The only danger is in being too far to the eastward, and not seeing the light at all, and getting into Mounts Bay, the weather being too thick to see the Lizards. Coming from the northward it is not so bad, as vessels may steer hold in for the Longships, there being nothing to pick them up in the offing, besides having a good light in St. Ives Bay.

791. Lighthouses, if painted red and white, would be much easier of identification.

22. Would you suggest the entire removal or a change in the position of any Lighthouse, Floating Light, Buoy, or Beacon? — if so, name it, and state why you think it should be moved.

3. Only as above named.

5. Not at present, nor until the shifting of a sandbank should make it necessary.

6. No.

7. I think a mistake has been made in the lighting of Zetland. The superior light ought to have been shown from Lambness instead of from the Bunaford Holms, as it would have led round the north of Zetland, and marked Baltic Sound at the same time. Only a very inferior light was necessary at the Muckle Flugga.

8. Recommend the Western Beacon, Castlemaine Harbour, being placed farther south, so as to form a transit with the Eastern Beacon when in the deepest water over the bar.

9. Godrevy lighthouse; better position on the Outer Stone; it would then have been placed on the danger it is supposed at present to point out, instead of a mile inside of it.

14. I cannot suggest any removal, as I think the present very good.

17. No.—20. No.—21. No.—22. None.—23. No.—24. None.—25. No.—26. I cannot suggest any change.—27. No.—28. No.—29. No.—30. No.—31. No.—33. I should not.

34. None but those specified above.

38. No.

39. The change in the Needles light, see 21. On the morning of the 29th ultimo it was scarcely perceptible, although Hurst lights were very distinct; it was on a north-east bearing. I attribute the difference to the coloured glass.

41. No.—42. No.—46. None.—49. None.—52. No.

53. In my opinion Seven Stones lightship is too far from the rocks to warn mariners of danger night or day.

55. I would suggest that every buoy should be black, or, if white or red, a black vein on them.—57. No.

58. In my opinion Seven Stones lightship is too far from the rocks to warn mariners of dangers night or day.

59. No.—60. No.—62. No.

64. I am of opinion that the Gull light ought to be removed to abreast of the South Brake buoy, in order to prevent ships passing through from the westward jetty outside the Fork or inside the Brake. The difference of the angle of bearing of the Gull light from the Brake and Fork being so small that the deviation of the compass on board many ships has a tendency to mislead those using that channel in large ships.

65. No.—68. No.—69. No.—71. No.—72. No.—74. No.—76. No.—79. None.

86. I would not.—87. No.—90. No.—92. No.

95. Many vessels having been lost in Breaksea Point I do deem that a light placed thereon would prevent this for the future.

97. No.—100. No.

104. The stone beacon at the Ox Scares should be made into a lighthouse to assist vessels running up by night.

107. No.—108. No.—112. No.—114. No.—115. No.

116. See 23.

118. No.—119. No.—120. No.—123. No.—124. No.—125. No.—126. No.—128. No.

129. See Clause 16.

134. No.—135. No.—136. None.—138. No.

139. See Number 8.

140. I do not know of any.

141. Would not.—142. No.—144. No.—149. Would not.

150. The Needles light would be far better on the rocks beneath than on the summit of the cliff. Improvements at other places to advantage might be made, but short of space.

161. No.—162. No.

163. In the Gore Channel great improvement might be made for small shipping.

167. No.—170. No.—172. No.

180. I would not without more experience.

181. Not one.

185. I must leave that to the coasters.

191. No.

196. Crosby shore light, it being of little or service in hazy weather.

198. None.

211. The removal of the beacon buoy on the Heaps, and lightvessel instead.

213. Many accidents have occurred in consequence of the above-named Lighthouses being improperly placed, and they ought to be altered without delay.

215. No.

219. I suggest, if the Newarp lightvessel was moved in a southerly direction two or three miles, it would be an advantage to mariners from the southward bound through the Gats, as the course is from N.E. to N.W.

224. The Needles light is very bright whilst white; but red is so very similar to a steam vessel's, and cannot be discerned above seven miles, but if revolved would be seen further.

226. I think the Newarp should be placed nearer the Cross sand, in order that ships of heavy draught from the westward might alter their course sooner through Hasborough Gats.

228. No suggestion to make.—229. No.—231. No.

232. I am of opinion, combined with experience, that if the Newarp lightship were placed three miles farther to the southward, it would be a great advantage to mariners sailing from the southward, and no disadvantage to those sailing from the north.

233. No.

234. Not any that I am aware of at present, except a beacon buoy on the north and south end of the Outer Dowling; one black and the other red. This I should strongly recommend as being in the track of large ships navigating that part of the coast, as there has been serious accidents by ships striking on it.
236. Move the Newarp to the Cross Sand end.
237. Depends on sands shifting, &c.
242. No.—247. None.
250. No, I cannot suggest the removal of any.
252. I think the buoy of Ryde Sand Head should be moved further eastward, and placed on the extreme point of the sand, because strangers, supposing this to be its position, are misled, and very frequently run aground on the sand.
256. No.
258. Change Copeland light, Belfast Lough, to Maw Point, being more extreme and lower; also Corsewall Point (Wigtonshire) light to the Lagon Rock, being the extreme west part of that coast.
262. If a lighthouse were erected on Fifeness, east of Scotland, there might be no need for the low light on the island of May, as that light would guide vessels clear of the Car Rock.
263. I have often seen the north end of Lundy Island when the south end has been obscure, the light also.
264. None.—272. None.
274. See Answers to 20 and 21. I may add, that Lundy light, at its present height, is quite useless in hazy weather.
276. No.—278. No.—280. Cannot.—281. No.—283. No, I do not know of any.—284. No.
285. Winterton Ness is of little use. Leading light on Great Fern would be better on Megstone; the bearing is the same, and channel outside Megstone safer; but expense of keeping would be much greater. If a light were at Fifeness, leading light on May Isle could be dispensed with.
287. Any light that is not exactly on the danger should be placed on it if possible.
288. I would not suggest any removal.
291. Objections did exist in the Needles light and Cape Clear, both have been remedied.
292. I would not.—301. No.—302. No.—303. I would not.
309. I think they are all in good position.
310. I should suggest a black buoy with a staff and ball for the Noman's Land, as the water is so broken in bad weather that the white buoy cannot be seen; and that Ryde Land buoy be placed further eastward on the point of the sand.
313. No.—315. None whatever.
316. I would suggest that the new lighthouse on Godrevy Island, St. Ives Bay, be removed to the outer rocks of St. Ives stones; for this reason,—in very hazy weather could be seen in time to keep clear, which from the island could not.
321. No.
322. I think, if Arklow float was on the south-east side of Arklow Bank, say, the south end of the bank bearing north-west, it would be a better guide in that dangerous bank.
323. No.
329. I would not, as I consider that in all respects they answer their purpose.
332. No.
334. I would do away with the upper light on the Calf, and put one on the Chickens.
336. No.
342. I think they are very well placed.
348. The South Rock light, Ireland, No. 336, should be removed from its present position, and exhibited on the south-eastern extremity of the reef; because, in its present position, it has misled many seamen, viz., among many others, the *City of Pekin* struck on it 9th March, 1858; the *City of London* passed inside the buoy the same night; the *Saxon King*, of London grounded on the reef the 10th January, 1859, 6.40 A.M.; and a coasting schooner struck the buoy on the 10th January, 1859, 6 P.M. All these declared that they judged the light to be from three to four miles from their respective vessels.
349. No.
350. I cannot.—353. None.—354. No.
355. Light on Blackwater Bank farther east, so as not to be mistaken in hazy weather for Tuskar.
356. No.
358. I would suggest that Hasborough lights be altered, so that, when in a line, to lead a vessel clear of Hasborough Sand, south end; then sailing and other vessels would have a good mark on each side of the Gat to beat either in or out.
361. None.—363. No.
364. Beachy Head would be better had it been on lower ground, so often capped with fog.
368. No.
370. The above is the only one that I know.
371. No.
373. See No. 21 Answer.
375. Crookhaven removed through Alderman Rock, the safest guide for the harbour on the port side.
377. No reply.
379. The Godrevy lights should be a floating light on the extremity of the rocks. Persons running for the light in hazy weather would be likely to strike the rocks.
384. I understand a light is being erected on the Calf Rock, which appears to me a mistake; because, if on the Bull or Cow, it would be a guide to run for Smeem Harbour.
385. I would suggest that the present low light at Spurn become the high light, and that it should be carried much higher than the present high light, the land being low.
386. No.
388. Leman and Owers lightvessel, as stated, because it has been taken for North Hasborough Sand end lightship.
389. Beachy Head light should be better further east, with a fixed red light within the range of the Royal Sovereign, or a floating light to point out those shoals.
393. No.
396. None that I know of.
397. No.—398. No.—399. I know of none.
401. Bardsey and Tuskar revolving lights are too near each other. The Kish might be two lights, one over the other, with advantage. Their present arrangement probably caused the loss of the *Pomona*.
402. No.—405. None.—406. No.—409. No.—410. No.—418. No.—420. No.
423. The South light on South Head, Sydney, Australia, should be removed to North Head.
424. I think the floating lightvessel on the Blackwater Bank should have both lights fixed, in order not to mistake her for Tuskar light in thick weather.
427. No.—429. No.—440. No.—445. No.
448. Arklow lightship, in my opinion, should be shifted further out by one mile and a half mile.
449. None.—451. No.—452. No.
460. Newarp light on the Noss Sand, the Stanford on the Sloth Head, better for ships going to the back of Yarmouth Sands.
461. No.—467. No.
469. A light wanted badly on Great Holmes Head, coast of Wales, for pilots as well as captains.
471. No.—472. No.
474. I have often, when bound to Dublin, steered from the Longships to Tuskar in hazy weather, using patent log and a good look out, by which means only we could sight Tuskar lighthouse, not discernible much over a mile late in the afternoon, when the first discernible light would be the revolving light on the Blackwater lightship, which might easily deceive sailing ships.
475. No.—476. No.—478. No.
482. So far as comes within my knowledge I would not suggest a change at present. Circumstances sometimes require a change.
483. I do not, except the new light on Blackwater Bank, which I conceive should not revolve, being so near Tuskar. Two fixed lights would do.
485. No.
486. The Tuskar light, in my opinion, is eclipsed too long, and the light on Blackwater Bank ought not to revolve.
487. No.
494. I think if Lundy Island light was lower, it could oftener and with more accuracy be seen in thick weather.
495. No.—496. No.—499. No.
500. I think a change might be made upon the Saltees lightship. I think a flash light more appropriate.
503. I would suggest the removal of the upper Calf of Man light to the Chicken Rock; the upper light is very often obscure when the lower is quite clear.
505. Nil.—509. No.—510. No.—511. No.—512. No.—514. No.
515. If the upper light on the Calf of Man was placed on

- the Chickens, it would be seen at a quarter distance in hazy weather.
516. No.—517. No.—518. No.—519. No.—522. No.—525. No.
526. The removal of the buoy on Monkstone, or the placing of a beacon on the stone, as vessels often foul the buoy, and do considerable damage. I have seen this happen many times.
527. I would not.
530. I am not sufficiently acquainted to form the opinion required.
531. No.—533. No.—536. No.
537. I would suggest that, instead of building the light upon McArthur's Head, Sound of Islay, one be built upon Sgeir Moal, Sound of Jura, and then McArthur's will not be so much needed. I think one light about Port Askrig for Sound of Islay, would be sufficient, as the Sound is so narrow, a leading light is necessary for going through in dark weather.
539. I have mentioned one in the fairway, see No. 8.
541. I cannot.
542. I am of opinion that the lightship of Coningbeg should be done away with, and the intended lighthouse on the rock about two miles from it should be built as soon as possible. It will be less liable to accident than the floating light, and mariners will see it at a greater distance.
544. No.
545. I would not.
546. Yes. I would bring what is called the Fairway buoy of the Cockle Gat in a line or parallel with the north-east buoy and the other buoys in the Cockle Gat.
549. No.—552. No.—553. No.
551. Blackwater Bank may be mistaken in hazy weather for the Tuskar.
561. Juna light to be opened up white easterly and northerly, from the cutting off the red, so as to discover the position of the inland at night, and as a guide to ships sailing or beating out down Channel.
563. The lightvessel in St. Nicholas Channel to be moved to the outer part of the Cross Sound, as a guide for vessels in the night-time, and in strong easterly winds, as ships could make more free with that dangerous sand, and make their passages, when they have often to return to the Humber.
565. I do not know of any that should be moved.
569. No.—578. No.—
579. Unless Lowestoft low light be of essential service to fishermen navigating Swashways or Channels, with which I and others are acquainted, discontinue it. See Answer to Question 19.
583. None.—589. No.
591. I can suggest no change as an improvement.
592. Calf of Man, upper light, removed to the Chicken Rocks; cannot be seen in thick weather.
593. I am not prepared to say.
595. I would suggest the removal of St. Nicholas lightvessel to the outside, as it would answer three purposes, it would answer the same as at present, going in and out the gateway, likewise for ships going outside of the sands in stormy weather, when the lights on shore are obscure, we could see St. Nicholas light.
597. No.
598. See No. 21.
601. Only what I have urged in regard to the Saltees lightship (see on).
602. St. Catharine's and the Owers, both being fixed lights, bright, one each, and laying on the east and western side for ships bound to Spithead; ships having run up Channel in thick weather, and have to steer by distance and soundings, after laying too, say, 12 hours sea and tide, they may not make allowance enough for leeway, seeing a light at first sight after laying to, coming thick again in such weather, they do not know one from the other, and they are so close together, had they have known they may have run for Spithead instead of knocking about at sea for perhaps a whole night; and I do not think any lights so close together as the Owers and St. Catharine's of one kind are good for the navigation anywhere.
603. I would suggest that the black and white spiral buoy on the Holm Sand be shifted to the southward, as I have struck the ground drawing 10 feet to the southward of the buoy, Stanford Channel, off Lowestoft.
604. No alteration necessary.—605. No.—606. No.
607. A pile lighthouse on Taylor's Bank, south-east end, should be substituted for Crosby shore light. A lightvessel in place of bell beacon.
608. Crosby lighthouse should be moved as above. (Answer 21.)
609. I would remove the bell beacon entirely, substituting a lightvessel for it.
610. A floating light for the bell beacon.
611. I would remove the bell beacon, and put a floating light in its place.
612. I would remove the bell beacon to make way for a lightvessel. I would suggest an improvement as above, with regard to Crosby shore light.
613. No.
615. Crosby lighthouse should be made so that it could be moved by means of a line of rails, according as the breeze shift, and act in conjunction with the Crosby lightship, or a pile lighthouse on Taylor's Bank, as a leading mark.
616. I would suggest a change in Crosby lighthouse as just stated.
618. I would suggest a change in Crosby lighthouse, as above (Answer 21).
619. The Saltees floating light is not of sufficient power for so important a position; a large lighthouse erected on the island or neighbouring rocks would be seen farther.
621. I would suggest the entire removal of the Rundlestone Rock off the coast of Cornwall.
622. I think the light on St. John's Point ought not to be a bright one, as the south rock is so, as well as Carlingford, and the Calf of Man—the *Great Britain* to wit.
625. As this question is not confined to the United Kingdom, I will say here that I think there should be a difference between Europa Point light (Gibraltar) and Tarifa (Spain), and many lights required in Mediterranean.
627. No.
630. All floating lights, buoys, or beacons leading to a roadstead should, in my opinion, be placed in a fairway mid channel, so that the masters might know how far to go either way, especially ebb or flood.
637. I think it is to be regretted (that when the South Foreland lights were reconstructed in the year 1841) that they were not placed in line so as to lead through the Gull Streams, then ships could run or work through by night or day, even should the Gull light be driven from her position, and they would have answered equally well as distinguishing lights; should the South Sand Head light be driven from her position, a single bearing would enable a vessel to avoid the Goodwin— plenty of room outside.
638. See answer to Question 8.
639. No.—642. None to suggest.—643. No.—644. No.—651. No, unless some contingency arose.—652. No.
654. Only those named above. Lights on the Irish shore from Blackwater to the Kish cannot be seen until ships are close in; and on the Welsh coast ships often get into Cardigan and Carnarvon Bays, when the captains think they are about the Isle of Man or mid-channel.
657. No.—658. No.—660. No.—666. No.—668. No.
671. I have no reasons to give why any lighthouse, floating light, or beacon should be removed.
674. No.—675. Cannot suggest.—676. No.
677. It has been reported that the Llanddwan Point light is to be discontinued; but I wish it to remain, as I am informed it has been the means of saving lives, ships, and cargoes, by getting over Carnarvon Bar.
678. No.—679. No.
681. A lightship on Liverpool Banks in the room of the bell buoy. In wild weather the bell is not distinctly heard, and in calms when thick, the motion is not sufficient to sound it.
683. No.
685. I would like to see the Owers lightvessel one mile further to the westward, so that a course might be shaped direct after passing her, for the Well lightvessel, without fear of a spring flood setting you on the Boulder Bank.
686. I would suggest a light to be fixed on the south point (low) of Lundy Island; also a low light (fixed in both cases) on Beachy Head, each of which could be seen better in thick weather.
687. The Owers lightvessel shifted a little farther out, as the flood tides set very strongly over the shoals.
688. Have had no reason.
691. No.
692. Not aware of any change being necessary.
695. None.—697. Cannot say.—698. No.

22

Question

22, 23

699. I suggested to the Trinity Board, London, to remove the Owens lightvessel sufficiently to the south-west of the shoal that vessels entering Spithead may preserve a line from it to the Warner lightvessel, without reference to the compass, so as to allow the Boulder Bank one mile. It was shifted, but not, in my opinion, sufficiently.
700. No.—704. No.
705. If white buoys are retained, change the colours of Gull buoy and North Bar buoy, in order that the outside danger may be seen first.
707. No suggestions.
708. Orfordness high light a red face, W. by N., or in one with Aldborough Knaps; ships coming out of the sea at night time would then know where to approach the sand.
709. Harwich low light to be moved to westward, so as to be in one with high one when in the Channel.
715. I cannot.—718. No.—722. Not any.
726. My answers to Queries 13, 14, and 15 apply to this one, as beacons, whether of masonry or of iron, secured by iron stays, are really in many cases half as serviceable as lighthouses, and five times better than buoys. They are, perhaps, in the long run not more expensive than buoys, as they are permanent.
729. No.
730. I do not know what alterations have been made recently; but a few years ago I thought that two lights out of three in one part were of little or no use; that was, Lowestoft low light, and the Stanford floating light; the former might have been removed close to the point, to guide vessels through the inner channel, and the floating light outside the Stanford channel.
733. No.
737. I would suggest a change in the position of Crosby lighthouse, which is now about three miles inland of low-water mark. A pile lighthouse at low-water mark should be erected instead of it. I would suggest the entire removal of the bell buoy, which is not a sufficient guide for the channel by night; and in foggy weather, which is invariably calm, the bell does not ring.
745. I think the Lizard lights are too close together, for at a very short distance off they appear as one.
754. I do not feel competent to make any suggestions.
755. No.
756. Saltees lightship cannot be seen well.
761. Mutton Island light, Galway Bay, removed to Hare Island, would be a fairway light leading up clear of all shoals, and still better brought in line with a red harbour light. I would propose, on a pier head run out in the roadstead to at least 27 feet water (low springs) in a south-east direction, from south-east angle of Mutton Island.
762. Not competent to judge.
763. No.
765. I would suggest a change in Crosby lighthouse (see Answer to Question 21). I would remove the bell beacon, and place a light vessel on the same spot to improve the navigation of the Mersey.
770. As before stated, the turning point at Calshot Spit is very badly defined at night, and the largest amount of traffic coming to Southampton by the western channel. Whether Calshot lightvessel might not with advantage be placed near the Spit, and a fixed light in Calshot Castle, to cut off Black Jack and north-east Mumble to south-east, which would lead through the south channel, and also to cut off Fawley beacon to the northward. I am aware that the lightship would then be very close to shoal water, but well moored. I think she might be kept in her position without ever having to veer on the Oudle.
772. No.
773. I think the floating lightvessel about to appear off the east end of Shambles (Portland) might be so placed in conjunction with the breakwater light to serve as a leading mark to clear the shoal; otherwise a compass bearing (liable to error) must be used.
775. I would suggest the removal of the low light on the Island of May (Fifeshire) to the place at present occupied by the beacon on the North Carr rocks.
777. Cannot say at present.
782. The South Rocks light (Cobown) has a reef extending a mile to seaward of it, partly dry at low water. This would be a good position to try one of the improved floating lights; if found to answer, the light on the rock might be discontinued.
783. I would suggest that Crosby lighthouse be a pile

lighthouse on the sands, to keep the light clear of the haze on the marsh land. The bell buoy should be removed, and a lightvessel placed about half a mile farther out, to give her room to run into port in case of breaking adrift.

784. No.

787. The beacon on Black Rock, Galway Bay, cannot be distinguished in the dark. I would propose a large stone beacon, about 30 feet high.

23. Would you suggest the placing of a new Lighthouse, Floating Light, Buoy, or Beacon on any part of the Coasts of the United Kingdom?—if so, state where it should be placed, and why.

1. No.—3. No, none.

5. I would suggest the placing of a large red nun buoy, with staff and beacon, on the Outer Dowding. I think it would facilitate the navigation between it and the Dudgeon.

6. No.

7. No urgent necessity presents itself to my recollection. I think an undue multiplication of floating objects is an error to be guarded against.

8. On the Fore Rock (Outer Basket), county Kerry, not only because it is the most western point of land in Ireland, but also for its anticipated utility for the navigation of the Shannon and vessels running down the coast.

9. A harbour light to mark the entrance into Fowey, and buoys or beacons to mark Udder Rock (2½ miles eastward of Fowey). A lighthouse on Wolf Rock, being directly midway between the Land's End and Scilly, having deep water close to, showing a good offing and position for ships and vessels, under all circumstances, in passing round the land.

10. Yes, the placing of a buoy on the 2½-fathom shoal of the Outer Green Grounds, in Swansea Bay, as represented by me to the Hydrographer of the Admiralty, in January 1859.

11. Beacons on Pierre-au-Vrache, westward of Alderney; outer rock, on Grois Ledge, north side of Alderney; and on the outer Jummelle Rock, north-west end, and on Sanquet, on north-east side of Alderney harbour light.

12. A light on Berry Head is much needed to guide vessels to Torbay, and as a certain mark for clearing the Skerries. A buoy is required at the east point of entrance to Plymouth Sound. An Irish steamboat was wrecked on the Mewstone Ledge about four years since.

13. A light is especially required on Aranmore Island, on the west coast of Donegal, where one formerly stood. It is the most salient point of the coast intermediate Rathlin O'Birne and Tory lights. It was a very injudicious step to remove it, and vessels have been wrecked for want of it. The lights, buoys, and beacons required to render available the many useful harbours on the west coast of Ireland are too many to enumerate here.

14. I cannot suggest any.

16. A large bell buoy at the entrance to the Needles, about 1½ to 2 miles south of the present red bell buoy, for steamers to make for in thick weather.

17. In my opinion, it is very desirable to place a lightvessel on the shoalest part of the Varne Bank, where the buoy now lies.

20. No.—21. No.

22. A small harbour light on the Stack Rock, in Milford Haven.

23. No.

24. I know of none.

25. No.

26. Yes, on the north-west end of the Outer Dowding I think a lightship would be of the greatest service in saving lives and property.

27. No.—28. No.—29. No.—30. No.

31. It is my opinion that a lightvessel stationed within the shoalest part of the Varne Sand (where the buoy is now moored) would be of great service, which would not only mark the locality of that shoal or sands, but also serve to mark the position of those in charge of vessels, who may not have made either Beachy Head or Dungeness in running up Channel, nor South Sand

- Head light, when ailing out of North Sea, it perhaps being heavy weather and strong winds, and not liking to make too bold with the hauling in to make the said lights.
33. It would be very desirable to place a larger buoy on the south-west part of the Shingles.
34. Floating light east end of Shambles.
36. As stated in Answer 15, one buoy near St. Thomas's Channel, that in case of necessity vessels may run through; another buoy four miles below, in order to facilitate vessels getting hold of the North Foreland; also it would assist vessels to run through between the Knock and Longsand when, the wind being too far southerly, and blowing heavily, they would not be able to get to the southward of the Kentish Knock.
37. No.
38. Not that I am aware of.
39. A light on Mount Batten, to lead clear of the Dray Stone, Knap, and Panther, as a leading mark by night into Plymouth Sound. I would also suggest a flashing instead of the red light on Plymouth breakwater.
41. No.
42. A floating light on the Varne would be good for ships passing the Straits of Dover.
45. Floating light on the Longsand Head would prevent many ships from going ashore.
46. Know of none.
48. I think a lightvessel would be of some service on the Varne, in the Straits of Dover, to be a caution to vessels nearing that dangerous sand.
49. Know of none.
50. No.—51. No.
52. I would suggest the placing of a new lighthouse, with a fixed bright light, on Strait Point, where it would be useful in making and taking the harbour of Exmouth by night, and a landmark for strangers by day running down from the eastward bound for the harbour, it being quite landlocked until you arrive abreast of it.
53. Wolf Rock: on the rock, so many vessels continually passing between Land's End and Scilly.
55. a white buoy has been taken away, or where it can be done conveniently, or have a black vane on the top.
56. I think a light on Cadland Point would be very useful for the large mail steamers. After rounding Calshot Spit, we could bring Southampton Pier lights open with Cadland light, until you passed Cadland Point, when Calshot light, a little open of Cadland light, would guide to your anchorage.
57. I would suggest the placing of a new lighthouse, with a fixed bright light, on Strait Point, where it would be useful in making and taking the harbour of Exmouth by night, and a landmark for strangers by day running down from the eastward, bound for the harbour, it being quite landlocked until you arrive abreast of it.
58. Wolf Rock. The beacon here stood so many years, why not a lighthouse? Vessels so continually passing such a dangerous spot, in my opinion a light should be, if possible.
59. A buoy on the eastern edge of Outer Dowsing, and also on the eastern extreme of the Cross Sand off Yarmouth.
60. No.
61. I would suggest that many of our lights for principal ports are unequal in power to the importance of the places, and might be improved.
62. No.—63. No.
64. A floating light, red, revolving on the south-east part of the Goodwin Sands. On account of the great depth of water close to the Goodwin, the lead is almost useless if the ship is going at ordinary speed; and that it would be the means of saving many lives and much valuable property.
65. I would suggest the placing of a new lighthouse, with a fixed bright light, on Strait Point, where it would be useful in making the harbour of Exmouth by night, and a landmark for strangers by day when running from the eastward bound to the harbour, it being quite landlocked until you arrive abreast of it. No.—71. No.—72. No.—73. I know of none.—76. No.
77. A floating light on the east end of the Shambles as a guide to Portland Roads.
78. Yes, a floating light near the north-west end of the Varne. Ships bound up channel with southerly winds and lazy weather, sometimes borrow to windward, for fear of the land, and miss the light at Dungeness.
79. Know of none.
83. I think, at Morte Point, there ought to be a light in the Bristol Channel.
85. Yes, on the West Skerweather Sands, owing to the Mumbles light being so often obscure with smoke.
87. No.
88. On Rarieur , first inside the Maul Head, Orkney, in making Kirkwall and running down that channel in a winter's night, is dreadful, and on the Cross Sand, Norfolk, the shore light has been many times obscured by fog.
90. No.
94. Yes; viz., for the outer navigation in connexion with Oversay and Skerryvore, on Duheartack (2,515); on the north end of Colonsay, and at the centre of the Sound of Islay, near Port Askaig (2481); in Loch-andail (Islay), near Port Charlotte, for the benefit of the numerous vessels seeking refuge, and, though last, the most important for the inner navigation, on Sgeir Mavile, in the Sound of Jura (2,515), on which the *Chevalier* (Steamer) was wrecked. These will complete the connexion of necessary lights, at a proper distance apart, will direct through the numerous channels, and clear of or off from most dangers on that part of the coast with which I am at present acquainted, and to which my remarks refer, unless otherwise specified. Buoys and Beacons are also desirable for the Kyles of Bute (2,174); viz., two near the Burnt Isles; on Cachsquier, one mile north of the south end of Gigha (2,037), and on which the *Marquis of Stafford* (Steamer) struck; a beacon on the Black Rock Sound of Islay (2,481); a buoy on the rocks north end of Risan Vie Faden, and off the south end of the Island of Luing (2,326); on the Bo Rock, off Salen, Sound of Mull (2,155); and a beacon on rock on the east side of Lisinore towards Appin Ferry. Above this, towards Fort William, I am as yet unacquainted.
92. Lighthouse on Morte Point beacon on the Monk Stone.
93. A floating on the west end of the Skerweathers, Bristol Channel, would be of great service, and is much required, as the flood tide is so strong it frequently throws ships out of their reckoning, and the Mumble light so close to the copper works of Swansea is frequently obscured for hours.
95. Morthoe Point, West Skerweathers, and Breaksea Point.
96. The same as Question 8.
97. No, none.—100. No.
101. North end of Island of Stroma: reason is, guide in passing through the Pentland Firth. Butt of Lewis should have one; reason is, guide in making land from America, Davis's Straits, Greenland, Archangel, &c.
102. North Foreland lighthouse to have an extra light in it, to strike the east end of Margate Sand.
103. A floating beacon on Smith's Knowl, in the North Sea; near to its shoalest part (15 feet, lat. 52° 52' N., long. 2° 12' E.). This shoal is steep-to, having 28 fathoms water at a distance of only a quarter of a mile, and is distant from the Norfolk coast 23 miles.
104. I would place a light at Locherpool, to save life; a buoy or beacon, at Rattray Head; a light on St. Abl's Head; a float at the Plough, or leading lights through the fairway.
105. Floating light at south end of Codling Bank, opposite coast of Wicklow.
106. A light on the Morte Point would be a great assistance to vessels coming up and down channel.
108. No.
109. A floating light on the east end of the Shambles.
111. One in Lynn Roads, as already stated, would enable vessels to run up the channel with safety.
113. I think a light on Heston's Island, at the entrance to the water of Urrd, in the Solway Firth, would be very useful.
114. None required, that I am aware of.
115. No.
116. Another lightship north-ward of bell buoy, Victoria Channel, Liverpool. Vessels with north-east gales would be enabled to pick up the channel, whereas often, for keeping far enough to windward, get out of sight of the lights. Also a light at Morte Point, for in heavy gales from the southward vessels too often get entangled with the Welsh banks, and Lundy cannot be seen, whereas, if they knew the exact whereabouts they were, smooth water and safety is easily obtained.

118. No.
119. A light on Outer Dowsing.
120. I think if a beacon was placed on the Skuystone, it would facilitate the navigation of the eastern channel on entering this port.
123. Vide Question 13.
124. Large beacon buoy outside Arklow Bank and the Codling Bank would be useful in hazy weather.
125. The Manacles is the most dangerous point in my district, and a lightship, I think, would be the meant of saving life and property.
126. No.—127. No.
128. I think a lightvessel stationed within the shoalest part of the Varne Sand (where the buoy now lies), would be of great value, as it would not only mark the locality of that dangerous shoal, but also serve to mark the position of those in charge of vessels, who, through hazy weather, accompanied with strong winds, may not have made Beachy Head or Dungeness.
131. On the Outer Dowsing, because it has only two fathoms, and many vessels are liable to be picked up by it.
132. On the Varne, in thick weather, a ship might pass Dungeness without seeing it, which has happened to myself.
133. A light (flash light) on the Hydraulic Tower, at Grimsby, New Dock, by its height it would be seen much farther than the Spurn lights, when they are enveloped in mist. Also the channel, between the Songsand Knock buoyed; and coasters, who could often get the Foreland when they are driven back to Orfordness or Yarmouth Roads.
134. As I have answered at No. 8, a light may be of service at the southwest end of the Varne, to those persons who, by thick and stormy weather, may be more fully prepared to know their position if placed; the southwest end is, I believe, best.
135. No.
136. To prevent the Lynn vessel getting too far easterly, and London tract too far westerly.
137. Yes. The placing of two leading lights for the Cockle Gat, on the shoal at Yarmouth, would save many lives. The difficulty of keeping a lightship in bearings, when running from her, induces many masters to attempt the Newarp Gat, which, with north-easterly winds and a flood tide, is a most difficult passage for slow or deep-laden ships.
138. No.
139. See Number 8.
140. Stated in the 15th Question.
141. No.—142. No.
143. A floating light is much wanted at the south-west end of the Barnard; for the want of it vessels are obliged to lay hove-to all night.
144. A lighthouse on Haskin Island; two beacons on Sand of Harris; two beacons in Loch Carron; two beacons in Lock Maddy.
149. Have never felt the want of any additional lights on any part of the United Kingdom.
150. There are sufficient lights in number, particularly on the coasts before mentioned; but buoys and beacons on many parts yet could be added to improvements, there not being the evils attending the latter as the former.
161. See No. 8.
162. No.
163. On the Black Tail, to prevent the Essex people from deceiving shipping, which I have seen many times in winter seasons. In the Gere, to enable small ships to proceed to and from the Thames.
167. Cannot.
170. No.—172. No.
180. My answer to No. 22 will also answer this question.
181. On Little Ormes Head two fixed lights.
185. I cannot say.
191. In consequence of the draft to the south-west of the tides in strong or in bad in crossing Lynn Well, there are several vessels stranded between Burnham and Blakeney in the course of a year. I do not know what to recommend.
196. One powerful bright light on Formby Point, to assist vessels coming from the northward to pick up the lightships; and discontinue the Crosby shore light, for it cannot be seen at any distance in foggy weather; and place a lightship at the entrance of the Queen's Channel.
198. None.
204. Yes; as stated in answer to No. 8, a floating light vessel off the north end, it being very dangerous; and, in my opinion, many vessels strike on that shoal, and are never heard of after.
205. Montrose Ness, as before in No. 8.
207. A floating light at the west side of the entrance to the River Uske, South Wales, would be of great service, as the present light strales too far inland.
208. Montrose Ness, as before remarked, No. 8.
209. Montrose, in my opinion, requires a lighthouse, as it is difficult and dangerous to make the harbour in a dark night.
210. Foze Rock requires a lighthouse with a revolving light; it is a dangerous rock, right in the way round to the west coast of Ireland to the southward.
211. Floating light on the Heaps.
212. Only the floating light, as before named.
214. Montrose Ness much required, as ships running down during winter with a southerly wind are often driven to seaward.
215. No.
216. Lighthouse on Montrose Ness, and one on St. Abb's Head.
217. I think a light near the Outer Dowsing would be useful.
219. I think it requisite, in my own judgment, if there were a lighthouse placed on St. Abb's Head, as it is a long distance from the Staples to May Island in that direction.
220. I think a light on Great Orme's Head, Liverpool Bay, would be of great service in guiding ships to the channels of Liverpool in heavy weather.
222. A floating light at north-east end of Inner Dowsing would be of advantage to all ships navigating that vicinity. The buoy removed to south-west end, coloured white. Four red additional buoys ought to be placed at the south side of Boston Deeps, for the greater protection of ships in gales of wind. For the same reason, four new buoys might be placed in Lynn Old Channel.
224. No.
226. Winterton Ridge and Outer Dowsing a buoy or beacon, not being water for ships of heavy draught.
228. No suggestion to make.
229. No, not as regards lighthouses, beacons, or floating lights; but, as regards buoys, see my reply to No. 15, and note attached.
232. I am of the opinion that a light on St. Abb's Head would be of great importance, as there is about 45 miles from the Staples to May Islands without any light.
233. A floating light would be of great service to ships hauling out at Hasbrough Gat to cross the Kent in easterly gales, if placed on the west side of the Outer Garbard.
234. I would suggest that a floating light be placed on the north-east end of the Outer Garbard, showing one red light stationary, for the safe navigation of large ships to and from the British Channel and North Sea. I think it would prevent many ships being lost on the sands at the entrance of the Thames, as has been the case to a fearful extent for many years.
236. Red light, or blue, on Filey Bridge, east coast.
237. We have lights enough for a farmer to navigate a vessel, if he could but say the Board of Trade lesson.
238. Mentioned in No. 3.
239. Mentioned in No. 3.
240. On Turnberry Point, east side of the Firth of Clyde, a great many vessels get wrecked on Brest Rocks every winter for want of a light on Turnberry Point.
241. Turnberry Point to keep off Brest Rock, MacCormick Island, a guide of the Iron Rock.
242. No.
243. Montrose Ness, and eastward Firth of Forth.
244. Floating light between west end of Varne and east end of Ridge Straits of Dover, having grown up of late so as to become dangerous to shipping.
247. I would not.
250. I would suggest the placing of a new lighthouse on Kemes Head; it would be a guide for vessels embayed to know their situation, and others to come to the roads and harbour beacon in Ramsey Sound.
252. I think a lighthouse is much needed on the Ilancois, Guernsey, south-west end.
254. I would suggest placing a new light on Ella Holm or Theisis Holm, in Shapensy Sound, Orkney. It is a dangerous sound; the tides turn very strong, and often thick, hazy weather, with heavy gales of wind.

- It is a dangerous place in a dark night. I would also suggest a new light on Holburn Head; it would be very useful for directing vessels into Scrabster Roads on a dark night; the land being so high, it is very deceiving, and strangers often bring up too far off in bad ground, and often drive off. Also leading lights for the Car Rock, on the coast of Fife.
256. I would suggest that a lighthouse should be placed upon Langness Point, Isle of Man, of a red colour, in order to distinguish it from Douglas Head or Calf Lights, because the point is low, and projects a great distance seaward.
257. A floating light off Breaksea Point, to lead ships clear of the point where they cannot see the other lights. A lighthouse on the south point of Scattery Island, to guide ships up to Tarbert.
258. See Answers to 8 and 15.
261. I would suggest placing a light on the south-west end of Guernsey.
262. If a lighthouse were placed on Fife Ness it would guide ships entering or departing from the Forth, between the Isle of May and the Car Rock. It would also be of great service to coasters rounding the Car either from the north and St. Andrew's Bay, or entering the bay from the Forth.
263. I suggest that a bright channel light should be placed at Ilfracombe, that coast being the northernmost land. In the channel, I believe, there are many vessels lost on the Skerweather Sands, by giving the high coast of Devon too great a distance. A good sounding bell on St. Ann's Head would be of great service in foggy weather. The same on the Mumbles Head, Swansea Bay. A black buoy on a rock called Tich-bull, east end of Stockholm Island, off Milford Haven. If there was a bright light fixed on the north-east end of King's Island, Bass Straits, many lives and much property would be saved. I would strongly recommend a bright fixed light on Robin Island, Table Bay, Cape of Good Hope.
264. A floating light on the north end of the Inner Dowsing would be a great guide for both London and Lynn ships.
270. Morte Point. It would enable mariners to mark the inset in Barnstaple Bay with north and north-west winds.
271. The places alluded to.
272. None.
274. I would suggest placing a bell buoy in place of the black buoy now on St. Ives Stones.
275. Wolf Rock.
276. No.
278. Hilpsforde Spit, south end of Walney Island.
279. Yes; a light would be of great benefit on the Tiraght, already mentioned; a light also on Scatten. The southernmost end of the island is very low and shoal off the points. The Shannon should be properly buoyed, and the light on the Samphire, Tralee Bay, requires considerable improvement; we are often close to it before it is visible.
280. Consider a lighthouse necessary on the south-west end of Guernsey. Vessels bound up channel, not having had observations for several days, are liable, by the indraft, to the southward of their course, and frequently are misled, taking one of the islands for the Isle of Wight.
281. No.
282. A pile lighthouse on McKenny's Bank, Lough Tayler Harbour; light on east end of Skerries, Port Rush; a light on Sheep Island, Rathlin Sound, screened in the direction of Carrickvarn Rock. Entrance of Lough Strangford,—light tower on Angus Rock to be lighted for refuge purposes. Black Rock, Warrenpoints, Lough Carlingford, to lead to the anchorage, the lough to be buoyed and beacons.
283. Yes; a lighthouse on the Island Innistiuir Rare, one of the Blaskets, to facilitate the navigation of the River Shannon and Galway Bay; also a light at the Black Rock, on St. Margurite Rock, in the Bay of Galway, to facilitate the approach to the Harbour of Galway at night.
284. No. Two lights should be placed on Falkland Islands, one on the southern and one on the northern extremity.
285. A float at Outer Dowsing. Steering for the Dudgeon leads too far in amongst the other banks, and outside you are in danger of the Outer Dowsing. Light on Oxcars, with Firth of Forth. Thousands of ships pass annually, and particularly for the safety of the fleets that seek shelter in winter.
286. On the Oxcar Rock, to point out the fairway at night. The high land at the top of the Forth darkens much, which makes it very difficult and dangerous to catch the fairway between that rock and the island of Snel Calm. Shipwrecks have occurred for want of this.
287. On the Sound of Jara a lighthouse should be built on the Iron Rock.
288. I would not.
289. A large beacon bell buoy on the Blackwater Bank, instead of a lightship, so it can be heard in foggy weather.
290. A new lighthouse on Burrow Head, county of Wig-town, for the safety of life and property, and in directing the mariner to get clear of the Solway Firth into the North Channel; it would be a great safety to the shipping interest where there is such traffic in the coal trade to Ireland; a steady red light would distinguish it from other lights in the vicinity.
291. Vide No. 8. Tiraght Rock, one of the Blaskets, a cluster 35 miles west of Loop Head. Scattery Island, near Kilrush, red light.
292. I am not acquainted with any part of the coast where either buoys or lights are required at present.
293. In the Firth of Forth I should say that a light should be placed upon the Island of Inchcolm, as the beacon on the Oxcars is only seen at a short distance; also an additional number of buoys from Queen's ferry up to Alloa.
294. Light on Inchcolm (Firth of Forth), to be a guide to the Narrows.
295. I would suggest that a lighthouse be placed on the Butt of Lewis or Barra and Rona, which would be most useful for vessels making the land in the fall of the year from America, &c.
299. A light upon St. Abb's Head, at the entrance of the Firth of Forth, would answer well for vessels making that Head from the Baltic, also steamers going south, having a correct depth to carry them round the Fern-island.
300. Yes; a lightship on the north shoal of the Outer Dowsing; I consider it a dangerous shoal with no guide to clear it.
301. See No. 8.
302. There should be a lighthouse on some part of the coast of the West Bay. Vessels often miss the Start or Portland, and stand in until evening.
303. I would not.
305. I suggest the placing of a floating light on the north end of the Outer Dowsing Shoal, lying in a direct track of vessels leading the north ports, with outerly winds.
310. I should suggest the placing of buoys at the places named in No. 15, because, for want of them, ships have frequently run aground at those places, and several have been lost.
313. No.
314. A floating light on the west end of Skerweather Sands, of Swansea Bay, being nine miles from the Mumbles Head light, which is often obscured by the fogs and smokes of the copperworks in the vicinity of the bay. It would be the means of guiding many vessels clear of those dangerous sands, and a good guide to ships bound into Swansea.
315. I would suggest the placing a beacon on the Chickens Rocks, off the Calf of Man, as they lie low.
316. A lighthouse on the Wolf Rock would be of great service to coasters beating round the Land's End in strong and hazy weather from the southward, and also for ships coming in from the Atlantic for the Land's End or Mount's Bay, with strong gales and hazy weather, not being able to see Scilly.
317. A floating light on the Varne would, in my opinion, be exceedingly useful and the means of saving many lives and valuable property, and save many ships from going on the French coast.
318. I should suggest the use of a floating light at the Varne shoal, in the Straits of Dover. While engaged in my vocation as pilot I have, on several occasions, when bound to the westward from the Downs, with large ships, the wind blowing strong from the westward with hazy weather, I have found it impossible to see the lights on the South Foreland from their height, while at the same time I have stood in between Folkestone and Hythe, and made the gas-lights on the shore. It has occurred to me, that if in this narrow strait I could see the shore lights, that a light on the Varne would have been of great service to me and the numerous ships that navigate those narrow waters.

319. On the Inner Dowsing, on the north end, because the tide is so strong up the Lynn Deep, causing so many ships to come on shore on the Norfolk coast.
320. I would suggest the placing of a lighthouse on the Hannois, at Guernsey; also one on the Corbiere, at Jersey.
322. A light on Straight Point (Exmouth Bar) would enable a vessel to find Exmouth Bar in a dark night.
323. A flash and a fixed light to be brought in one, so as to guide eastward of the Rundle Stone, in place of the beacons, as the steamers complain that they cannot tell when they are abreast of the stone. Coasters and bay boats also complain.
324. A light on Cahose Point to mark Blackwater Bank.
328. In consequence of so many ships coming ashore between Wells and Blakeney, I think that light on the Inner Dowsing would prevent them.
324. I would suggest that a lighthouse may be erected on Black Rock, off Black Tod, county Mayo, so as to enable vessels on all occasions to enter the bay with greater safety. I would also suggest that a beacon such as is on the Wolf Rock, off the Land's End, may be erected on Black Rock, Galway Bay, which would be seen at a greater distance than the iron perch now in use, and a buoy on the extreme of the shoal extending westward from Black Rock.
330. Yes, on Hillre Island, leading lights through Hilbre Swatchway into Chester River, from the Liverpool north-west lightship.
332. The Rundle Stone is a very dangerous rock, and many dangers around it, and buoys have been placed near it, and a beacon on it which could not be seen by night, and not at all times then. If two lights were placed on the land, say red and green, in a line with the stone, and not to be seen when near, it would save a great many lives and much property, and facilitate navigation very much.
333. Lighthouse on Copinshay or Mullhead, east coast of Orkney; being at present no guide to the entrance to Kirkwall.
335. Yes, a lighthouse on the Wolf Rock, and a beacon on the Rundlestone, both being very dangerous.
336. As already named at Question 8, Inner Dowsing, as coasting vessels are often driven on this bank from the effect of the flood tide.
337. See 15.
347. Named in Questions 8 and 15.
348. Answered at 22.
349. At St. Alban's Head.
350. I cannot.
353. None.
354. I would not suggest the placing of any light or buoy.
355. No.—356. No.
358. I would suggest that a buoy be placed upon Winton Ridge and the end of Smith's Knowl.
359. Now that a lighthouse is in course of erection on Guernsey, I would suggest also one on the Corbiere, Jersey; else, ships may mistake the Guernsey light for the Start or others on the coast of England, and be in imminent danger of being wrecked on the numerous rocks between the islands or adjacent coast of France.
363. Would recommend a lighthouse on Straight Point, near the mouth of the River Exe.
364. A light on St. Alban's Head, as it lies so much in the track of ships running for the Needles. I have known several ships lost near there.
366. Turnberry Point being a very low point, vessels going in channel frequently run on Brest Rock; sometimes two striking on together at the same time. There has been an immense loss of life and property there.
367. A lightship on the west end of the Skerweather would facilitate the going into the Mumbles, as the Mumbles light is often obscure, and a lightship on the west end of the Culvers would add to the safety of the navigation of the Bristol Channel.
368. A light on Morte Point, and a beacon off the Stones, St. Ives Bay.
369. I should think a light on the north end of the Outer Dowsing, on account of hauling out the wind from the eastward.
370. I would recommend a light upon Turnberry Point, Ayrshire. There is a number of vessels go on shore at that place.
371. A light on Morte Point, and a beacon off the Stones, St. Ives Bay.
373. A large buoy on the north end of the Outer Dowsing; laden ships may strike on it, and light ships sweep their decks, or turn over if they shift their ballast as they cross in a gale of wind.
375. Beacon on the rock in Youghal Bay, and also on rocks in Dungarvon Bay—the Gainers.
377. Not aware of any required in this locality.
378. Yes, two, viz. a lighthouse on Morte Point to mark the position of that dangerous reef; also a lightvessel on the west end of the Skerweather Sand to show the position of it for the better navigating the channel and Swansea Bay.
379. A floating light on the end of the Skerweather Sands off Swansea; many lives have been lost in consequence.
380. Lighthouse on shore near the Stone.
381. Lightship on the east part of the Shambles as a guide into Portland Roads, and one on the west end of the Varue, as a guide to the Downs or through the Straits of Dover.
382. Floating light on the Skerweather; lighthouse on shore opposite the Pendlestone.
383. A floating light at the Cross Sand, because it is often hazy, and the Newarp cannot be seen until close to it, and the current is very strong.
384. I think there ought to be a light on the Galley Head, and there ought to be marks on Castle Townsend, on the entrance of Long Island, and on the rocks in the Kenmare, particularly the Maiden Rock, ought to be marked, as well as those in Kilmakilloge and outside Green and Ballynoverne harbour. The rocks in Ballinskelligs Bay ought also to be marked, and by a small expense an excellent shelter could be given there by filling the small opening between Horse Island, at the west side of the bay and the mainland. I think a harbour light at the west entrance of Berethaven would be useful. The supply of Admiralty charts at Queenstown requires attention.
386. No change suggests itself to my mind.
388. Grimshy dock tower, because it can be seen when Spurn lights are shut in behind Dimlington high land, and as ships can have ten fathoms, and, before the lead can be hauled in, be on shore.
389. A bell buoy in a direct line between Tuskar and Holyhead, two leagues from the latter. A bell buoy two leagues west by south from Dungeness, as leading marks to Holyhead and Dungeness in foggy weather.
390. I have answered this at No. 8.
391. On Dumancy Point is a shoal reef; vessels bound to Dundalk will try to make Carlingford light, if heavy weather, may get on Cooling Point by so doing.
393. Stated in Question 8. Reason.—Lundy light being so very high, the slightest inclination to haze is entirely lost; the other, in hazy weather ships coming up the south side of channel would find it very convenient in passing between the banks of sand, the tides having a great tendency to run on angles.
394. On the east end of the Shambles, and a large buoy on the outer edge of the Blackwater Bank, and two or three more along the Arklow Bank.
395. None.—396. No.
397. Yes; north, Island of Arran. Within the last 10 years several ships have been lost on and about Arran Island, running for the north channel, and not having got an observation for several days. There is now 13 miles of bad coast between the extreme ranges of the lights on Boughy O'Bera and Long Island, which is not lighted, and which, I think, requires lighting as much as any other part of the coast.
398. Large stone beacon on north Bull Wall. In Ducklin River.
399. No.
400. Upon the westernmost of the Blaskets, called Tiraght, I think a light most desirable.
401. No, not under present circumstances. Perhaps there are too many lights already.
402. No.—405. None.—406. No.
407. A lighthouse on Saltees Island would be of more use than the present lightship in making the land about Carnarvon Point.
410. No.
412. Paa 51° 58' N. B. og 2° 3' L. E. Greenwick foreslaaes, al Arbodizeth et Fyrokib med rodt fast Fyr az eet pridt Blink-Fyr. Paa 51° 1' N. B. og 1° 20' L. O. Greenwick en Klokkeboie-til Advarsel for Skibe sagande ind den Engelske Canal.
418. Not any plan.
420. Blackwater Bank light should be a standing light to prevent mistake.
424. I do not, but I think the lights are much arranged in

- the English Channel than they are in St. George's Channel.
427. No.—429. No.
431. A lighthouse on the Maw, inshore of the Blackwater Bank, east coast of Ireland, as before named.
434. See Question 8.
440. No.
441. Guernsey.
443. A large beacon bell buoy on the Blackwater Bank, instead of a lightship, so that it can be heard in foggy weather.
445. No.
448. My opinion is, a light is wanted on King's Island, in Bass' Straits, Australia. I think a light would be required on St. Paul's Island for ships bound to the above port.
449. None.—451. No.—452. No.
454. Leading lights in Peakfield Gat, where the present light is eclipsed. Cannot say if to northward or southward at times.
456. St. Abb's Head.
460. Buoy on Henterton Ridge, one on Homer outer bank; light on the Outer Dowsing; all very bad places, and little water.
461. A floating light in the middle of Carnarvon Bay. Vessels steering from the Tuskar to the South Stack often find themselves driven in the bay, for want of such a light.
463. Morte Point, Bristol Channel. Vessels to or from the Land's End have to alter course at this point, and Morte Stone is very dangerous.
467. No.—471. No.—472. No.
474. I would recommend a buoy on the Horseshoe Reef of rocks, near Wicklow Head. I also recommend a lighthouse at the entrance of Wexford, harbour of Wexford.
475. Yes, a light on St. Alban's Head because in foggy weather Portland might be missed. The *Lyne* was nearly lost under the Head.
476. St. Alban's Head. A lighthouse would be of vast importance to the steam packets bound to Southampton.
478. A floating light on the west part of the Nash and Skerweather Sands.
481. At Question 8 I have stated where two lightships are wanted; viz., one on the west end of the Causeway, and the other on the west end of the Patches. I am of opinion that many ships that are lost, and never heard of, get driven into this bay, get on the Causeway, and go to pieces; and they would be of great service in the coasting trade between Port Madoc and Aberystwith, Barmouth, &c.
482. Beg to refer you to No. 8. I also think a light to facilitate the navigation of the East Swab would be useful. Many a vessel would be able to obtain shelter in dark and stormy weather, but cannot for want of such facility.
483. No.—485. No.
486. I could not.
487. On Great Ormes Head. I should suggest a steady green light, because it can be distinguished from any of the other lights, fixed on the north-west point to keep vessels clear of the Dutchman's Bank to the westward, and to the eastward to keep clear of the Constable Bank.
489. No; but I would recommend some of the outer light-vessels on our coasts be furnished with the code of signals; and when the master of such vessel observes a ship steering a course likely to endanger the property and lives, that from the lightvessel the signal be hoisted "Tack ship," or "Haul on your port" or "starboard tack," and then run up the number representing the lightship, by which the master, not having made the land, will know his situation, and save the ship.
490. I am of opinion that a floating light a short distance south of the Blackwater Bank, on the coast of Ireland, with fog signals would be of great benefit, and more particularly to strangers that are unacquainted with the tides.
493. A light on the Bull, Cow, and Calf, near Bantry Bay, as the Skillings and Fastnet Rock lights are too far apart. Ships approaching the channel are often set to the northward in thick weather without observations.
494. I think a light on Morte Point, in the Bristol Channel, would be of great benefit to shipping in the Bristol Channel.
495. A lightship to the westward of the Verna and Ridge Sands (Straits of Dover), to keep ships clear of those dangerous shoals. I think one or two landmarks on the south-west coast of Ireland would be of great service; say, on the Stay Rocks one, and another on Gally Head. Shipmasters, in the winter season and thick weather, trying hard to make the land to the westward, and between Cape Clear and the Old Head of Kinsale is generally selected for that purpose; so that a conspicuous beacon on one or both of those points, I am of opinion, would be of great service.
498. Yes, a large beacon on Galley Head, to the westward of the Old Head of Kinsale, as ships making the and thereabouts in bazy weather have been deceived by the appearance of the land, as it is comparatively low.
499. No.
500. I think the lights are very well regulated upon the coast of Britain.
501. On the site of Arranmore old lighthouse there is a long line of dangerous coast from Ferry Island to Rathland O'Birne light, and it is the general landfall for the north channel.
502. The beacon to be replaced on the Rundlestone; a new beacon on Corrigapene Rock, Dungavarr Bay, also on the Gainers in the same way; and the harbour buoyed, also a buoy on the Bar Rock, Youghal Bay, and the bar and harbour buoyed.
505. At the north-west buoy of Lune I would recommend a floating light, because there is good anchorage, and large ships may ride out any gale with good ground tackle; I believe it would save much life and property, for, with westerly gales, ships to and from Liverpool are frequently driven into Morecambe Bay. The tide sets strongly in from all parts of the coast.
507. Nos. 8 and 15. My reason, the increased number of steamers carrying mails, and otherwise passing said points.
509. Portmadoc.
510. No.
511. Yes; a light on the Outer Dowsing, also one off the Deeps in the Swain, as both places are dangerous with easterly gales, and many ships and lives have been lost on them.
512. On the Shambles, Portland being made a harbour of refuge.
514. Yes, at Murt, a lighthouse.
515. Chicksen off the Calf of Man.
516. I believe if a floating light was placed on the Outer Dowsing it would very much assist ships in the north-country trade, particularly large ones. In my recollection many ships have been supposed to have been lost there.
517. Floating light on west end of the Culver Sound, Bristol Channel, the light on the Flat Holmes being often obscured by fog, being too high.
518. Milford lights are frequently obscured, and as it lies so far inside the Crow and Milford Islands, I think some sort of light on Skokham Island would be of great use.
519. I would suggest a light near this harbour as a guide for all vessels, that is to say, ships working up or down the channel, entering into this bay with the wind from the southward, being a deep and dangerous bay, and no signal whatever from Portland to the Berry Head on Start Point; in fact, Berry Head only, from its boldness and size, also having Torbay near.
521. I have recommended in No. 16 former sheet.
522. Two leading lights at Yarmouth or near Gorestone, to enable ships to enter or leave the Yarmouth Roads at night through the Cackle Gat, and at St. Abb's a stationary light.
523. I am of opinion that a lighthouse placed on the Vee Skerries, lying off Papa Stone, would, from the situation, be the best for benefiting the west coast of Nil, Islands of Zetland, and be very necessary.
525. Two leading lights at Yarmouth to lead through the Cackle to enable ships to enter or depart safely in the night.
526. Yes; the floating light on the west end of the Skeawether: my reasons were given at length in a letter to the Secretary of the General Ship Owners, &c., in answer to a request made through him by Duncan Dunbar, dated the 16th February, 1859.
527. I should place a light upon St. Abb's Head.
528. Wexford being a dangerous coast, and always to be dreaded both by foreigners and coasters, a lightship on the South Bay would be the means of saving life and property.
530. I would suggest a landmark for the best of the bar of

- Waterford, in case the buoys were removed, that any stranger might run in.
531. No.
533. I suggest a large black beacon buoy on the Manacles.
536. A floating light half-way between Dungeness and South Foreland, to avoid running on the coast in thick weather, in the event of having no pilot.
537. I already suggested and recommended the Sgeir Moal Sound of Jura for a light. My reason is, that I think it the most necessary light now proposed, or even building; instead of last, it ought to be first. Buoy or beacon, Catsgeir, near Gigha, Sgeir Tarsing, Sound of Roasa, and Port Appin; and a buoy in Saltees Bay, Sound of Mull, and Sound of Pabla, near Broadford. These are, in my opinion, the most important.
539. St. Abb's Head, for ships bound for the Firth of Forth; Butt of the Lewis, for ships making the land from America, Greenland, Davis's Straits, White Sea, &c.
540. I strongly recommend a lighthouse being built on the Hanois Rocks, Guernsey, to prevent shipwreck and loss of life, to ships coming in channel.
541. None.
543. The west coast of Zetland is much in need of a light; the Vee Skerries most suitable; the Island of Foula, or Foul Island, the most westerly point, being, for the reasons stated, Question 20, too high land. Beacons should be placed on the half-tide rocks, the Rimbles, in the centre of the fairway of Yell-sound, Iceland, the usual passage for the local traders between the east and west sides of the islands, and with south and south-east winds, for the Greenland and Davis's Straits fleets. They could be easily erected, and render a passage, now dangerous, very safe.
544. Beacon on Rundlestone Rock.
545. I would suggest that a floating light be placed in the Inner and Outer Dowings. The Dowings are very dangerous shoals.
546. I have mentioned in Questions 8 and 22.
549. No.—552. No.
553. No particulars to remark.
554. No.
555. Yes; a floating light, on the Thorn Bank in the Solent, as specified in Answer No. 8. A light is very much required on the Island of Sombroero, as, on approaching the West Indies through the Sombroero Channel, great caution is required, particularly at night, as the currents are strong and uncertain, and the Anegada and Horse-shoe Reefs most dangerous. The island also itself is very low.
556. A larger buoy on the Rundlestone would be much better for ships running down round the land in hazy weather.
558. A lighthouse is required on the Hanois, Guernsey, on one of the outer rocks. I should suggest a red light; it would facilitate the navigation. Ships embayed would be able to determine their position.
561. On Skerimaole Rock, in the Sound of Jura, two miles from the nearest shore. The necessity of a light on this small rock I would strongly urge, being very dangerous, lying right in the thoroughfare, making the navigation of the Sound of Jura exceedingly difficult at night, and especially in hazy weather. Light on Ruadh Skeirs Island, as a leading light up the Sound of Jura, and also a guide to the harbour of Crinan, and to the Crinan Canal. Light on north-east point of island Kerrara, as a guide through the sound to Oban, the entrance of which is very difficult to discover at night. 1. Buoy on North Rock, off Ruadh Island, in the Sound of Jura. 2. Buoy on Two-feet Rock, off Risanvick Faden Island, Sound of Jura. 3. Buoy on Rock, south-west point of Linn, in the Sound of Scarba. 4. Beacon or buoy on the Black Rock, Sound of Islay. 5. Buoy on Bogha an Sagant Rock, south-south-east from the Garvelloch Island. 6. Buoy on Skeir na Fheurim Rock, near Gellanock, Sound of Kerrara. 7. Buoy on Bogha Nuadh, off the Island of Dubh Sgeir, inner Channel of Mull. 8. Buoy on Skeir na Lour, Scallardale Point, Sound of Mull. 9. Buoy on Rock, west-south-west from the Green Islands, Sound of Mull. 10. Beacon on the Little Strike, entrance of Loch Sunant. 11. Buoy on Bodha das Strath Rock, entrance of Loch Navish. 12. Buoy on Six-feet Rock, north by west from Kyleakin lighthouse. Buoys on Rocks, entrance of Loch Carron. Buoy on Three-feet Rock, off the Sannach Reef, Sound of Pablay. Beacon on Skeir na Tarsin, east of Scalpa Island. Buoy on Rock, entrance of Loch Torredon. Buoy on Julia Mealan
- Rock, Sound of Dirnay, Summer Islands, Sutherland-shire.
562. Yes. I consider a light absolutely necessary between St. Alban's Head and Durlstone Point, for steamers bound to the Needles, as five times out of six Portland lights are never seen (although in 25 fathoms water), from the peculiar nature of the atmosphere surrounding the Bill. I recommend a fixed and red flash light, exactly like Cadiz lights, as that is the most distinguishable I have ever seen, in thick rainy weather, in any part of the world. The light would enable mail steamers to make the Needles, when they are so frequently kept out all night from not having sighted Portland.
564. Yes. A floating light placed off North-east Cross Sand would be an invaluable guide for coasters, and more especially Scotch steamers to Edinburgh, who always pass in the night, with thousands of passengers annually; and who have more difficulty in hazy weather, at the back of Yarmouth Sands, than any part of the coast they navigate, for the want of a light, as above stated. It would also be of great service for vessels from the Elbe and Baltic, who frequently come in at the back of Yarmouth Sands.
565. I would place a lightship on the north side of the Varne, in the Straits of Dover, and also one on the east end of the Shambles, Bill of Pentland. The Varne is very dangerous in the night, also the Ridge. The Shambles also are dangerous to large ships when the marks from the shore cannot be seen. If a lightship was on the Exeter end you could go in in the night as well as the day. A light on Morte Point, Bristol Channel, would be of great use there.
566. Two leading lights on Yarmouth Deans, to enter Yarmouth Roads in gales of wind from eastward, Outer Dowings lead clear, with easterly winds. Boston Buoys are not well seen when there is a sea running.
568. A floating light in the Solent on the north-west part of the Brambles or Thorne, as mentioned in Number 8. It would be of immense advantage to ships in general, and especially to the West India Mail Steamers, if there was a lighthouse erected on the Island of Sombroero, at the entrance to St. Thomas, in the channel of that name, as from the dangerous vicinity of Anegada, and its reefs, ships cannot enter that channel unless sure of their position by observation on the previous day, especially as the currents are strong and irregular in that part of the world.
569. No.
570. A floating light in the Solent, on the north-west part of the Brambles or Thorne Shoal, as mentioned in No. 8. It would be a great advantage to ships in general, particularly to the West India Mail Steamers, if there was a light placed on the Island of Sombroero, in the channel of that name (West Indies). Wrecks are frequently occurring on the Anegada Reef, many of which would, in all probability, have been avoided had there been a light on the island referred to, the currents being strong and uncertain in these seas.
572. Yes, a great many; but the officers of the Packet Steamers should be inquired of.
575. In sailing along the south of Ireland in bad or thick weather the light vessel of the Saltees is of very little use; and in case of not seeing Tuskar, I consider that it would be good to have a lightship, with three powerful lights, in mid-channel, between Tuskar and the Welsh shore, which, no doubt, would be the means of saving many a valuable ship, owing to the cross-set of tides in that part of the channel, as many vessels, no doubt, have been lost owing to the same. Likewise, I consider that there is no more than two points westerly variation along the whole of that part of the coast, which I have frequently found.
576. Arranmore, Ireland. It would assist the navigation greatly in bad weather, as Tory's is a poor light in bad or rainy weather, and when near the coast Rathlin O'Brine cannot be seen.
577. On the Coningbeg.
578. A lighthouse on Great Orme's Head. Reason,—a certain mark for our distance from the Sand Heads of the Mersey.
579. Yes; I beg to suggest that a floating light be placed at the outer entrance of Hewett's Gat, where the South Scroby Buoy is, it would be a great improvement. (See Appendix to Mariners' Evidence p. 579.)
580. Lighthouse on the Wolf Rock off the Land's End.
583. A new light on Three-stone Car, and one on the Wolf

- or Sol Peder, Penarth, to assist the navigator to navigate the small channel of the Land's End.
584. Wolf Rock (lights), and entrance of Victoria Channel, Liverpool.
585. I think a lighthouse, instead of the bell beacon, off the Queen's Channel, Liverpool, would be an improvement.
586. A light on Wolf Rock.
589. Wolf Rock, because in running from the Lizard in thick weather it is possible to shut in the Longships.
590. Yes; the placing of a new floating light near the south-east buoy of Courtan Sands, so as ships coming from the south-westward might ship a straight course for it, and from that to the Newarp, and vice versa.
591. In my opinion a light on Strumble Head would be very useful to vessels working into and out of Cardigan Bay.
592. On the Wolf Rock, the Longships light not being visible at a distance in thick weather.
593. A buoy on Rattray Reef, as the shoal lies off the land, and many vessels have been lost on it, not aware of the distance it was from the land.
594. Outside the entrance of Ferry Harbour in particular a light is very much wanted.
595. I would suggest that a floating light placed at the Outer Dowings would facilitate the navigation, as in stormy weather and strong east winds vessels bound both north and south steering an outwardly course would make the light, when they frequently miss the Dudgeon, and strike on the Dowings, as there is no guide there at present.
598. No.
599. None on these coasts, but in the Colonies some are needed.
601. Yes, on the Coningbeg Rocks there really should be a lighthouse. In a heavy gale of wind from W.S.W. to S. when the sea runs so high, the lighthouse then, when most wanted, is almost useless. The lanterns cannot be kept much above the rail, then consequently the lights cannot be seen far.
602. Berry Head, Torbay, being a good roadstead, is always resorted to both by men-of-war and merchant ships of large size; I think a green or blue light on Berry Head, with a change of colour bright or red, would enable men of war to go in or out as well by night or day, and pick up their berth as well with the heaving of the light—the light to be similar to Plymouth Breakwater, only blue or green, as there are none of that colour on this part of the coast. Small vessels as much as possible to anchor so that they may not change the colour of the light, laying further under the land. I have known many vessels drove up Channel that may have lain safe in Torbay, if there had been a light; this will be opposed by pilots and fishermen. Dodman:—a light on this place would enable vessels to anchor in the bay, and when not able to lay in the bay with a shift of wind, would enable them to run for Fovey, or get down Channel for Falmouth, the Eddy-stone being more than 20 miles on St. Anthony's light at Falmouth, shut in there, and no light to be seen on this part of the coast; and there is a deal of traffic at the different ports and places about here. And I think if the Gibbon is wanted to make the land here by day, a light is wanted by night. Fishguard Roads, St. George's Channel, being a good roadstead, and the only one between Shadwell Roads and Milford Haven for south and west gales; this is a spot much resorted to, but difficult of dark nights for want of a light. A blue light on the western point to be seen seven miles off would be a great benefit to this part of the coast. Scomar Island near Milford Haven:—these islands are in the track for vessels altering their course from Ireland and Liverpool bound for Milford Haven and up the Bristol Channel; the mail and other packets, though thoroughly acquainted, often feel great difficulty here in thick weather. A red light and gong in foggy or thick weather here would, and is wanted. The tide here runs often from five to six knots, and so much foul ground causes a heavy sea, and bad for navigating between the Smalls and Milford Haven: many vessels are lost about this part of the coast. Milford Haven entrance and up the harbour:—Chapel Rock at the entrance has only 14 feet low water, and the sea breaks heavy in it; a buoy here is wanted. Stack Rock, a red light:—this light would, on the proper bearing, open of Thorn Island, would clear the Lewis Rock and buoy at the entrance of the haven, which has only 18 feet at low water; this light would be a great benefit;
- many vessels have run up Sandy Haven Bay and been lost; it would likewise enable vessels to leave the haven at night better. Likewise Pwlchroan Flats on the south side of the haven above Milford; I think a buoy on the east and west end of these flats, as it is steep-to, would benefit for strangers; there are two red lights in the dockyard for leading up the harbour, clearing the flats on the south side, and the Wear Spit on the north; but these lights are only common lights, as the others in the dockyard; they are in a good situation, but they ought to be higher and more powerful to be seen five miles off; the Wear Spit formerly had a light-vessel, when the Government boats run the mails to Waterford. The Carr Rocks and Shelf:—a light-vessel was likewise placed here by the post office, and kept up afterwards by the Admiralty until the Waterford mail was discontinued by the Government; this light would, likewise enable the vessels to clear the dockyard bank, lying in the middle of the river, and only eight feet water low tides, and the Channel only 20 fathoms wide in this part. Lenny Head, a most dangerous part of the coast: there is a beacon on the Crow Rock, but I am of opinion as there are more vessels lost on the Crow Toes than Crow Rock making bold for the beacon, I think three beacons on the land placed so that the centre one and west one would clear the North-west Toe, and centre and east one clear the South-east Toes, and the centre beacon placed and painted that by seeing a particular part of it over the land vessels would be outside to the southward of the rocks. I have made these few remarks for others, not myself, as I am Queen's pilot, and it would be against me as a pilot; but I think all necessary.
603. I would suggest that a large nun buoy be placed on the north part of the Outer Dowings, as there is great danger in crossing the sand.
604. No change necessary.
605. As before stated, I think a light on St. Alban's Head might be useful for steamers running up Channel for the Needles, supposing the Needles new light does not answer that purpose.
606. Yes, on the Causeway, and on Cardigan Bay; owing to the infragth of the tide, vessels become embayed on the south and east of Bardsey, from the absence of any light, when from their own calculations they were supposed to be outside.
607. Pile lighthouse on West Hoyle, west end, to lead clear of Constable and West Hoyle, and mark the entrance to River Dee. A light-vessel for entrance of Queen's Channel; leading lights for Beaumaris River (on Watch-house Point and fall of Baron Hill); buoys on Selker Rock, Hilsford Bank, and Foul Ground, Bahama Bank, Blaney Channel.
608. A lighthouse on North Dock Wall or near Walton to lead up Crosby Channel, and to act with Rock light for Rock Channel; buoys on Selker Rock and Foul Ground off Walney Island, to facilitate navigation; on north end of Bahama Bank to mark the Channel between that and the Whitestone Bank; in Welsh Channel, River Dee, to define the channel.
609. I would suggest a light on Orme's Head as a good place for lying-to; and also to lead clear of the West Hoyle Bank, for which purpose it should be masked or coloured on a certain bearing; a floating light for the bell buoy for the improvement of the navigation of the Mersey; buoys on Hilsford and Foul Ground, and at Blaney Channel, River Dee, to facilitate navigation.
610. Yes, on Orme's Head, or on west end of Hoyle Bank, to lead up to Liverpool or Chester Bars; outside Queen's Channel Bar, a floating light in place of bell beacon, which is not a sufficient guide, is sometimes run down in the night, and does not ring in calm and foggy weather; buoys on Selker Rock, Cumberland; on Hilsford Bank and Foul Ground, to mark the entrance into Peel à Foudré; on Bahama Bank, north end, to mark the passage between that bank and the Whitestone Bank; on Craig Rock, Peel Bay.
611. A light on Orme's Head would be a comfortable thing for ships lying off and on in bad weather; and by masking, changing colour, or showing an additional light in the direction of the Constable Bank would be a great help to navigation. A floating light should be put in the place of the bell beacon, which is sometimes run down and does not ring in calms; leading lights for Beaumaris River; buoys on Selker, Cock-speck Rocks; on Hilsford Bank, Walney Island; on

- north end, Bahama Bank: in Blaney Channel, River Dee.
612. Yes, on the Great Orme's Head, to enable masters of ships not having obtained pilots, to keep an offing, and to lead clear of Constable and Hoyle Banks; a lightvessel in place of bell beacon, which is not sufficiently useful at night, is sometimes run down, and does not ring in calms with fog; leading lights should be established on Watchhouse Point and Baron Hill, Beaumaris River; buoys on Hilsford and Foul Ground, Walney Island; on Bahama Bank, north end, in Welsh Channel, and Welshman's Gat, River Dee; another on Dutchman's Bank, abreast of Causeway buoy, Beaumaris River, as the buoys on this bank are too far apart.
613. On the Varne, for the reasons before stated at Question 8; and I think a large buoy, similar to the Royal Sovereign buoy, might be placed with advantage on the east end of the Skerries; if the weather is at all thick the land marks are difficult to distinguish, and the soundings deep, not approaching nearer than 20 fathoms.
614. A light on Orme's Head as a stern mark for the North-west lightship, coloured or shaded in the direction of Constable and West Hoyle Banks; buoys on Selker Rock, Cockspeck, Hilsford, and Seldom Seen.
615. A lighthouse on Orme's Head as a mark to clear the Constable Bank, &c., a leading mark for north-west lightship, other important purposes. A floating light instead of bell beacon as a mark by night for the Queen's Channel, and to ring a good bell in foggy weather, for which purpose the bell beacon is of no use should it be calm; buoys on Selker Rock, Foul Ground, off Walney Island, and Dudgeon Sands.
616. A light on Orme's Head would facilitate navigation, but as a pilot I can do without it. It might be marked or coloured so as to lead clear of Constable and Hoyle Banks; a floating light in lieu of bell beacon, Queen's Channel, would be a great improvement. The bell is now not of much service at night, and the beacon occasionally capsizes, and has been several times run down; buoys on Selker Rock and Hilsford Bank.
617. I suggest a light on the Great Orme's Head, on the west end, to facilitate the conducting of ships into Liverpool Bay.
618. A floating light should take the place of the bell beacon, to mark the entrance to the Queen's Channel, as by night the beacon is of little use, and has been several times run into; in calm weather the bell on the present beacon does not ring, and in strong weather it cannot be heard. A light on Orme's Head would be very serviceable in clearing the Constable and Hoyle Banks. Buoys should be placed on Selker Rock, Hilsford, and Cockspeck Scar.
621. I am not aware.
622. A light on the Black Rock in Carlingford Bay would be most useful. Mr. Hoskyn, who has recently surveyed Carlingford Bay, can prove this.
624. See Question No. 8.
626. A lighthouse on the Skerries, west of the Portland Firth would be of great use; also a floating light west of Corn Rock, as vessels in a north-east gale could round it close, and keep the north shore on hard and wide, the risk of getting over in Dunbar Bay, which has been fatal to a great many.
627. In my opinion a floating light outside the entrance of Liverpool, say 8 or 10 miles, and very brilliant, as a fairway light, would be useful.
628. I would suggest the placing of a light on the Stag Rocks.
630. As I named before, the placing of a light on the Outer Dowling would be a great benefit for the east coast.
632. Only where I have already named.
633. Northward of the Outer Dowling, as there is numbers of large ships navigating this coast; say, red, fixed, visible one and a half to two leagues.
635. On the Varne or Ridge.
636. I know of none requiring such.
637. Should suggest a light on the Bramble.
638. In answer to Question 8 I have suggested placing a light at the Cross Sand. A glance at the chart will show the irregularity of the soundings near that sand, and that they cannot be depended upon as a leading guide towards the Newarp, and in hazy weather the lights on shore cannot be seen. A light placed with the Cockle and Winterton lights in a line will point out where the sand can at all times of tide be crossed in that direction in fine weather. A due consideration of the number of colliers and other ships at all times passing the Outer Dowling, and the danger attending them with easterly gales, will assuredly prove the necessity of one there; it was long since contemplated.
639. See Answer No. 15.
640. A light should be placed on the Ve Skerries, Shetland, which are detached rocks, three miles off the most prominent part of the west coast of mainland. There is not a single light (although much needed) on the west coast of Shetland, and the lights at the extreme north and south are 60 miles apart; a light on Orme's Head would be of great benefit to navigation; and a lightvessel instead of the bell beacon, River Mersey.
641. An efficient beacon is required on the Rundlestone and buoys are much required on the Shambles off Portland, and on the outer part of the Owers shoal.
642. Not that I know of.
643. It does not at present occur to me to suggest lights, buoys, &c., elsewhere.
644. No.
645. A revolving light on St. Alban's Head, and also a light placed on shore in a line with any floating light, to act as a leading mark, independent of buoys or bearings.
646. I think a floating light placed between the Ridge and Varne in the Straits of Dover, would be of great benefit to shipping, the shoals being very dangerous.
647. A light on the Orme's Head would enable vessels to stand in with confidence eastward of it, and be of great service to keep hold of when not prudent to run for Liverpool.
648. A light on St. Alban's Head would be of great service to steamers bound to the Needles; on the Brambles; on the Solent, for steamers coming from the Needles and going to Southampton. Also a lighthouse on Sombrero, West Indies, to avoid the Aneгада Shoal, which the *Paranatta* lately founded on.
649. See No. 8, for West Hoyle. In thick weather ships often get to southward of North-west lightship, and the fear of doing so often keeps iron steamers outside all night.
650. On the Wolf Rock (Land's End), a light would be invaluable.
651. See Nos. 15, 16.
653. On or near the Shambles, to facilitate the entrance to Portland Harbour.
654. I have not thought of any other than before mentioned.
656. A light on Wolf Rock, a beacon on the Rundlestone and Manacle Rocks.
657. I know of none that are requisite, as a lightvessel is, I understand, about to be placed at the east end of the Shambles, off Portland.
658. No.—660. No.
666. I think a lighthouse placed on the Hanois Rocks, west side of the Island of Guernsey, would be of great use in the prevention of shipwrecks.
667. On the west end of the Varne I have thought a lightvessel might be useful in working from and running for the Downs in thick weather.
668. No.
671. I would suggest placing buoys on the Pwlichroggan Flats in Milford Haven, as in No. 13, and I think a good light on board the *Andromache* (powder depot) moored off Bull Well, would facilitate the navigation of the Haven, especially steam vessels.
672. Grassholme Island, a light, red; Brandies Rocks, before named, a beacon.
673. Grassholme Island, red lights.
674. No.
675. Cannot suggest.
676. I have no suggestion to make.
677. I would have a light on Strumble Head as before stated, to warn mariners not to run further into Cardigan Bay, and the beacon on the Wislan Rock, as many vessels have ran on it, it being a half tide rock in Portlincain Bay.
678. On the Wolf Rock, to enable vessels to navigate between Scilly and the Longships with greater safety; also for vessels working up and down Channel in foggy weather.
679. No.
681. A light of some description on Langness Point, on the Isle of Man, would be a great acquisition to coasters from and to ports in Ireland and ports in Cumberland. The point lies low, and extends seaward for a considerable distance, and in thick hazy weather the high land looms behind large, that you cannot perceive the lowland until you are close to it; a light then might be

- picked up, when at other times lights on the highland, such as Douglas Head and the Calif, are not visible.
683. No.
685. I think the floating light about to be placed on the east end of the Shambles, will be a very great assistance as a guide to Portland Harbour, to avoid the shoal; and I would like to see a floating light on the Royal Sovereign Shoal, as I think it would be the means of preventing those lamentable accidents which have occurred to so many ships picking themselves up on the coast of France when bound up Channel after passing Beachy Head.
686. A bright fixed light on Morte Point, Bristol Channel; a black buoy on a dangerous rock, one third of a mile off entrance to Barra Harbour, Hebrides; a light on Pheant Isles, Minch.
687. A lightvessel on the Royal Sovereign Shoal instead of the buoy; it would be a great guide for vessels coming up and down Channel; a lightvessel on the Shambles, to facilitate vessels going into Portland Roads.
688. Cannot.
690. Floating light on the south east end of the Shambles, to lead into Portland at night clear of the shoals.
691. No.
692. Not aware of where any are required.
695. No.
697. I think a buoy on south-west part of Skerries near Start Point would be useful in case of thick weather.
698. As to my experience of the English Channel, no.
699. If the present light at the Needles answers for the navigation in the neighbourhood of St. Alban's Head well; but, if not, Dundlestone Point is the place to have one, as stated in replies 2 and 8.
700. No.
701. I would suggest placing a lighthouse on the Wolf Rock, as an assistance in going round the Land's End.
702. A good powerful floating lightvessel exhibiting a bright and coloured light, in the vicinity of the Varne or Ridge, would save vessels from shipwreck upon the French coast.
703. Portland, east of the Shambles.
704. I am unable to do so.
705. Floating lights (red revolving) near the Burt Head or South Brake, it being difficult to hit the Channel between the buoys at night, as the South Foreland high light cannot be depended on in hazy weather, and in large ships the mizen mast prevents a stern bearing off Gull light; it would also be convenient for ships running through the Gull stream from the southward. Floating light (similar to Gull light) near the Keeps in Swin Channel, the distance between Swin middle and Gunfleet being too great, if hazy, for steamers navigating that Channel at night.
707. I have to suggest the placing of a floating light on the Rundlestone, Shambles, and Royal Sovereign Shoals; I am of opinion it would add much to the safety of vessels.
708. North end of the Outer Dowsing, with the wind from the eastward, bound to southward from Flamborough Head, we are compelled to keep on a lee shore, for if we keep to the eastward we have nothing to warn us when we are approaching them.
709. Light on Garrison Point, Sheerness, to lead ships into Sheerness by night.
714. A beacon on the north bank, between No. 4 and 5 black buoys in the Rock Channel, Liverpool.
715. I am not aware of one being requisite anywhere.
718. Stated in Question No. 8; we lose sight of Menai Straits light and Beaumaris light, being no guide to us.
719. A gun much wanted as a fog signal on the Copeland entrance of Belfast Lough.
722. I cannot think of any place.
723. No suggestion.
724. I would recommend a light on Rock or Bill, north of Cambay Island, in the Irish Channel, to be green.
725. See answers to Questions 3, 8, 13, and 16.
726. A light on St. Alban's Head, properly distinguished from the Needles and Portland Lights. A lighthouse on the Manacles, or a lightvessel moored off them; these are very dangerous rocks when the Lizard lights are not visible in thick weather. A new lighthouse on Rue Ra Head, between Loch Gerloch and Loch Ewe, on the north-west coast of Scotland, would be of great advantage to vessels going round Cape Wrath.
728. Yes; a lightship off the Foreland, Bristol Channel. In thick weather, running up channel, we are obliged to make south side to avoid the dangers on north side. Lundy seldom visible at those times, and Ilfracombe light is indifferent and uncertain.
729. I am not aware of any being required.
730. I think floating lights at such places as the Cross Sand and the Outer Dowsings would be of service, as they lay in situations where there is the greatest traffic in the world. There are other parts equally dangerous, but they are more out of the way; and it might lead to mistakes to have too many lights near each other, unless they are varied in their appearance, so as to be easily distinguished from one another.
732. Yes; off Shambles, a floating light on north-east point.
733. No.
734. A monster buoy on the Bouldre Bank, as a better guide for ships proceeding to Spithead from the eastward.
737. I would suggest the placing of a first-rate lightvessel in place of the bell buoy, as the Queen's Channel is the most important entrance to the Mersey. A light-house on Orme's Head, to keep ships clear of the Constable and West Hoyle Banks; light to mark or change in the direction of danger. Lighthouses on Watch-house Point and Camp Hill, Beaumaris, for leading lights up the river. Buoys in Blaney Channel; at north of West Hoyle; on Selker Rock; Cockspeck Scar; Hilsford Bank; north end of Bahama Bank; on Craig Rock, to facilitate navigation.
738. It would be of great service to steam ships if a lightship was placed at the eastern part of the Cross Sand off Yarmouth, and something to mark the Outer Dowsing.
739. I think there should be a lightship on the Outer Dowsing, because it lies in a fairway for large ships, and neither buoy, beacon, or light on it.
740. I think a floating light ought to be placed on the Outer Dowsing. Suppose a ship from the north, drawing 20 feet or more, taking a departure from Flamborough Head, she steers for the Dudgeon, the wind being easterly, and heavy sea; she steers without the Dudgeon. The distance being so short between the Dudgeon and Outer Dowsings, a light is much wanted.
741. On the north end of the Outer Dowsings; having ships of 21 or 22 feet water on that part of the coast the Outer Dowsings is dangerous.
742. I think there should be a lightship on the Outer Dowsing, north end, because it lies in a fairway for ships crossing the deeps, or making the land.
743. The Harbour Commissioners at Galway appear desirous of giving more facility to the steam ships, &c. entering Galway, probably a bell buoy on the St. Margaret's Shoal, a beacon on Black Rock, and a fairway light exhibited from Mutton Island, below the others at some distance, might suffice. The light on Mutton Island does not show far enough out in the bay. Arran lights being altered, are invisible inside the island in the direction of the bay.
745. Since the new light has been placed on the Needles Rocks I don't know any part of the United Kingdom that requires a light or buoy.
746. Yes; a floating light on the north end of the Outer Dowsing, because it lays in a track with easterly winds from Flamborough Head towards the Woud; during gales the sea breaks very heavy on it. Also on the south end of the Cross Sand, because the shore lights are often obscured during the winter months with frost and haze.
749. The one they are now placing on the north-west coast of Guernsey will be a very great advantage.
750. I would place lights on the Dodman, and a harbour light at Fowey. Also lights on Pedler Point and Berry Head.
754. If any new light is needed it seems that it should be in the only place in the channel where the range of one light does not range within another which is between the South Bishop and Bardsey.
755. In 50 fathoms water, between the Tuskar and Smalls.
756. I know of none.
758. On the Island of Heesker. There being no other light between the Butt of Lewis and Barra Head. Many ships bound through the Pentland Frith from the West Indies, America, &c. steer for the Butt, and are often set to the southward about Heesker. It would also serve to point out the entrance to the Sound of Harris, where ships may have shelter, and a navigable passage through, and escape the fate which they so often find on the rocky shores of South Uist and Barra.

23

Question

23, 24

759. St. Alban's Head, because a shipmaster may miss seeing Portland in hazy weather, and, being anxious to make the Needles, may haul in and find himself embayed.
760. The want of a light on the Tiraught Rock is much felt; it would be of the greatest advantage to ships navigating the Shannon, and also Galway Bay.
761. 1st. I believe and know that a small red light on Omearh Rock, which nearly joins the south shore, Carlingford Bay, would be advantageous at night, and the tower by day. The direction on the Admiralty chart, "after clearing the Earl's Rock," &c. to "steer for Warrenpoint," leads on the Gaunaway Reef, which thus caught up the *Sea Nymphs*. 2nd. A red light on Carriganane, Dungarvon Bay, would enable vessels at night to wait for water over Dungarvon Bar, there being good anchorage and shelter to lee of the rock. 3rd. A red light, raised on the slob to the west of Durnish Farmhouse (the present lead in to Foynos Harbour for the main or west entrance) would be a fairway light, and lead in both entrances.
762. Not competent to judge.
763. No.
765. A lightvessel in Cardigan Bay, to keep ships clear of the Causeway. A light on Orme's Head, to keep ships clear of Constable and Hoyle Banks. A lightvessel in place of bell buoy, which is not a sufficient mark for the entrance of the Queen's Channel by night or in fog. Lights at Bangor and Beaumaris, to lead up Beaumaris River. Buoys on Selker Rock; Hillsford and Foul Ground, Walney Island; north end Bahama Bank, and on Craig Rock, Isle of Man; Blaney Channel, River Dee, to improve the navigation.
768. I would suggest a monster black buoy, with a beacon, to be placed on the south-west end of the Boulder Bank (Owers); this, with the buoy on Bullock's Patch, and the beacon buoy on the Dean Tail, would facilitate the navigation to Spithead, and make the passage perfect.
769. I suggest that the Kenebeg lightship be done away with, and a lighthouse erected on the Cummy Bay Rock. Ships are so liable to run inside of the ship, this being anchored so far off; by so doing this would be a great saving of men, and safer position for a light to be so placed.
770. The eastern end of Shambles is at present not marked; but I hear a lightvessel will be placed there shortly. Ships bound for Portland will have to shave the Shambles close with westerly winds.
772. No.
773. I suggest leading lights (visible at six miles) on the shore near Hill Head (entrance to Southampton), to mark the channel between the Bramble Shoal and north shore, enabling the mail steamers to enter by night on the lights in one to within a ship's length of the Calshot lightvessel, when, the southern river being open, there would remain little difficulty in clearing the shoal called "Jack." In the absence of this suggestion, I would move the lightvessel to the north-west elbow of the Brambles.
774. I would suggest the placing a new lightvessel at the north part of Outer Dowsing (viz.), a flash light every 10 or 15 seconds.
775. If the suggestion at Question 22 is impracticable, then a "Jack-in-the-box" lighthouse should be placed on Fifeness, and a light exhibited that would show only in the direction of the Carr Rocks, so that vessels rounding the Carr would know when they were abreast of it, and when it was safe to alter their course. The North Carr is not the only place where I would suggest the placing of a light; and I have only mentioned it because it is of the most importance to us Dundee traders. The inner sound (Farn Islands) is often used by us coasters, especially in strong westerly winds, when we feel as if there were a necessity to use it. To facilitate the navigation of that channel, I would suggest the placing of a light somewhere about Holy Island Castle, so that by its bearing we would know when we were abreast of the Plough Seat; and I would suggest the strengthening of the low light on the Farn Island, because it, like the low light on the Island of May, is a poor light, and is often not to be seen when most needed. A light upon the Oxscars (Frith of Forth) would be of great use to vessels trading to ports in the Frith to the westward of them, and likewise to vessels running for the Hope roads for shelter in strong easterly gales. I will say nothing about St. Abb's Head, because, from an advertisement that I saw

in the newspapers a few months ago, I believe there is to be a light placed there.

776. I would, (viz.), north end of Outer Dowsing. In navigating the North Sea with large ships drawing 22 or 23 feet water, or, leading across the deeps, it would greatly assist us in charge of large ships, especially with east winds.
777. I do not remember any place that wants such at present.
778. A floating light on the north end of the Outer Dowsing would be a good guide for heavy ships coming from the northward, as it is dangerous to steer too far in with a 22 feet ship; there are over-falls to the north of the Dodgon light, with only four fathoms on them at low water.
780. At Lochindahl, in the Island of Islay, a lighthouse is particularly required on the north side of the entrance to the harbour, and a buoy on each side of the channel, it being a bar harbour; and it has frequently occurred that vessels have struck on the bar in consequence of the channel (which is a quarter of a mile broad) not being properly buoyed on each side. And a beacon should be placed on that dangerous sunken rock off Laggan Point, on which, within my long period of service, I have seen several vessels strike, one of which sunk immediately; in short, I cannot too strongly impress upon your minds the necessity of making Lochindahl a harbour of refuge, to save both lives and property.
782. Yes, at Sheep Island, or on the Rue Point of Rathlin Island, to lead through the sound. Also at entrance of Lough Strangford, for refuge purposes; a tower has been built here, but not illuminated. Also on Black Rock, Lough Carlingford, to lead to anchorage off Warrenpoint.
783. Yes, on Orme's Head, to keep ships clear of the Constable and West Hoyle Banks. On Barow Hill, and Watchhouse Point, to lead up Beaumaris River. At the entrance of Queen's Channel, in place of bell buoy, which is not a sufficient guide in dark or calm foggy weather, buoys on south end Hillsford Bank and Founley Spit, Walney Island, and north edge of Bahama Bank, to facilitate navigation.
784. In certain states of the atmosphere a light below the lower light on the Calf of Man, would be very useful.
786. I would suggest a lighthouse on the North Carr; or, if that is impracticable, a Jack-in-the-box on the extremity of Fyfe's Reef, to know when to round the reef on either side.
787. The Mageretta Shoal is the only danger under water in Galway Bay not sufficiently marked. A light vessel would supply the defect.
789. I would strongly recommend a lighthouse on the Foze Rock; this might be one revolving bright and green alternately, to distinguish it from Loop Head light Skelligs, Slyme and Arran lights. On no rock, point, or island on the coast of Ireland is a light more required than on the Foze Rock. This light would be of the greatest use to vessels in rounding the Baskets trading to Limerick and N.W. coast. Skelligs lights to remain, and to show the same lights as before.
790. On the Orme's Head. As the distance is so great from Point Lynas to the N.W. lightship, and the tide so strong, that in dirty weather when it is necessary to go slow, and sometimes lay to, it is hard to tell what course the ship is making, so that a light on Orme's Head or on the Constable Bank, would enable seamen to renew their departure for the N.W. lightship.
24. If you are in the habit of passing Lighthouses with coloured Lights, do you consider that they are discernible at a sufficient distance, and that such Lights are sufficiently distinguishable from one another, and from white Lights, in all weathers?
1. All lights that I am in the habit of passing are sufficiently distinguishable.
 2. Yes.
 3. I have generally found them so.
 4. I am in the constant practice of passing lighthouses, and I consider the arrangements admirable.

II.

4 A

5. Yes.—6. Yes.
7. In my opinion the distinction between the different objects has been well marked.
8. Generally they are, but the Tralee harbour light is an exception.
10. Yes.—14. I do.
15. I am not in the habit of passing coloured lights.
16. All I pass I consider perfect.
17. I am satisfied with the present system.
18. Yes, but a white is seen at the greatest distance.
19. Yes.—20. Yes.—21. Yes.—22. Yes.—23. Yes.—24. Yes.—25. Yes.
26. I frequently pass the lighthouses with coloured lights, and I think they can be seen quite a sufficient distance.
27. Yes.—28. Yes.—29. Yes.—30. Yes.—31. Yes.
33. Very seldom they are discernible at a sufficient distance.
34. Coloured lights are not discernible at so great a distance; but when made they are distinguishable from white lights.
36. I have often noticed the Gull Stream light flaring up when swinging about more at one time than at another.
38. Yes.
39. I do not.
40. I consider they are discernible at a sufficient distance to be distinguishable from each other.
41. Yes.—42. Yes.
43. All coloured lights, used as leading marks, in my opinion, ought to be much stronger than any other, to prevent them being mistaken, in thick had weather, from steam or sailing ships' lights.
44. From London to Isle of Wight all the lights are good.
45. Yes.—46. Yes.
47. Yes; especially red lights show well.
48. Yes.—49. Yes.
50. All lights that I am in the habit of passing are sufficiently distinguishable.
51. Yes.—52. Yes.—53. Quite so.
54. Yes; those coloured lights which I pass are discernible at a sufficient distance.
55. A good bright light is the best ever I saw.
58. Quite so.—59. Yes.—60. Yes.
61. I think the lights may be distinguished from the lights caused by ships generally.
62. I never felt any difficulty.
63. All lights that I am in the habit of passing are sufficiently distinguishable.
64. I am of opinion that the system used in these lighthouses is good, and the lights sufficiently distinguishable.
66. I consider they are discernible at a sufficient distance to be distinguishable from each other.
67. I consider the coloured lights are discernible at a sufficient distance.
68. The red lights are not so good to make out, in hazy weather, as white lights.
69. I think they are quite distinguishable.
70. I consider they are discernible at a sufficient distance to be distinguished from each other.
71. Yes.—72. I do.—73. Yes.
74. I cannot give any opinion.
75. Yes.—76. Yes.—78. Yes.—79. Yes.—80. Yes, I do.
84. I am not in the habit.
86. I am not in the habit.
87. Yes.
88. Quite distinguishable from each other.
89. I believe the certainty of distinction to be more important than being seen a few miles further off.
90. Yes.
92. Only in the habit of passing Newport light, which is discernible at sufficient distance.
95. Yes.—96. Yes.
97. I have generally found them so.
99. Yes.—100. Yes.
101. Yes.—102. Yes.—103. Yes.
104. In hazy weather coloured lights are not so easily seen as bright lights, but on nearing them can be seen sufficiently to avoid danger.
106. Yes.
107. I am not in the habit of passing lighthouses with coloured lights.
108. Yes.
111. I cannot suggest any alteration.
112. Yes.
113. I think a red light easily distinguished from a white one, though not seen so far.
114. All that I know of are quite sufficiently distinguishable.
115. I do.
118. No.
119. Cannot say.
120. I think so.
122. Yes.
123. I think so.
124. Yes.—125. Yes.—126. Yes.
127. All lights that I am in the habit of passing are sufficiently distinguishable.
128. Yes, I do.—129. Yes.
134. Only the harbour lights, and that on Southend jetty, and which latter requires fine weather to be distinguished far off. White lights are far preferable to red, being far better, and seen at a much greater distance.
135. Yes.—136. Sufficient.—138. Yes.—139. Yes.—140. Yes, they are sufficient.—141. Yes.—142. Yes.—143. Yes.
144. A red light can generally be distinguished from one of a natural colour, but green is apt to be mistaken for white. The red generally can be distinguished at a sufficient distance.
149. Do not.
150. In very bad weather, when the knowledge of a particular colour is required, could there be an improvement to cause them better distinguishable it would be a great benefit, as it often happens that one sight is only obtained.
156. Yes.
157. Not always.
158. Yes.—159. Yes.—160. I do.—161. Yes.—162. Yes, as far as I have seen.—163. Yes.
165. I think they are sufficiently distinguishable from one another.
167. A green light may be mistaken, but not the other colours.
168. I think they are not discernible at a sufficient distance, but I think they are sufficiently distinguishable from one another.
170. Yes.—172. Yes.—175. I do.—179. I do.
180. I am in the habit of passing coloured lights; and, in answer to the latter clause of this question, I am not prepared to answer.
181. According to weather, which requires judgment.
183. Yes.—185. They are.—186. Yes.—191. Yes.—193. Yes.
198. Quite discernible and distinguishable.
199. Where I am acquainted they are quite distinguishable.
201. Yes.
202. I have not been in the habit of passing many coloured lights, and am, therefore, not competent to give an opinion; but I think that a green light can be seen farther than any other coloured light.
203. Yes.—204. Yes.
205. Cannot say.
206. Yes.
208. Cannot say.
212. Yes.
213. I think the bright light preferable to any coloured light, and would have all first-class lights bright, in three classes, viz., steady, flashing, intermittent.
215. Yes.
217. I consider they are.
219. I have found them discernible at a certain distance, and distinguishable from white lights in all sorts of weathers.
220. Consider that Roche's point light (Cork Harbour) not sufficiently red, or brilliant, for all weathers.
221. Yes.—224. Yes.—226. Yes.—227. Yes.
228. The coloured lights are superior to bright lights; generally, are sufficiently distinguishable from the bright lights and one another, but our present coloured lights need improving.
229. I consider Spurn low lights, at the entrance of the Humber, to be a very indifferent light.
230. Yes.
232. I have always found them discernible at a sufficient distance, and sufficiently distinguishable from each other, and from white lights, in all weathers.
234. I think they are quite sufficiently distinguishable and discernible in both cases, thick with snow or fog excepted.
235. I think they are.
236. Yes.
237. When there is a red and white revolving light we can do very well; but when the light is white, not so well.
242. Yes.
244. White lights are preferable; many cannot distinguish colour in lights.
246. Yes.—247. Yes.—249. Yes.
250. I consider they are.

251. Very few coloured lights have I seen, and it has always chanced to be in fair weather, when I have found them quite discernible at a distance of 10 miles and over; but there is a certain state of the atmosphere under which a bright light will exhibit a red colour.
252. I have at times experienced a difficulty in distinguishing coloured lights from white lights, particularly in hazy weather.
253. I think they are all well arranged; in misty weather, red lights are not well seen.
256. Yes, I do.—259. Yes.
260. I think they are.
261. The coloured lights that I have seen on different parts of the coast are sufficient.
262. I have always found that white lights are seen before the coloured lights, and are easily distinguished from each other; but the difference between a dark red and pale red is not easily seen, particularly at a distance.
263. The white lights are the best.
264. Quite so.
269. They are sufficiently distinguishable from one another.
270. I do.
272. None.
274. So far as my observation has gone, I think they are sufficiently distinguishable.
275. Yes.—276. Yes.
277. I always found the lights I passed easy to be distinguished in all weathers when I could see them.
278. Yes, in ordinary clear weather.
279. Yes.—280. I do.—281. Discernible.
282. The red, yes.
284. See Question 19.
285. I have not seen Blackwater House float, but think a revolving light on it and another on Tuskar are too near; and the difference of height (10 feet) between the Floats' two lights is too great; in showery weather the one might be mistaken for the other.
286. In general they are sufficient.
287. Coloured lights should be more powerful than lights of the natural colour.
288. The lighthouses which I am in the habit of passing, viz., up and down the English Channel, I think are sufficiently distinguishable from one another, and white lights, in all weathers.
289. I think they are.
292. I am; they are sufficiently discernible to distinguish them from white lights in all weathers.
293. Yes.—294. Yes.—295. Yes.—296. Yes.
299. Red lights are not so easily distinguished as bright ones, but they are of the greatest importance when constructed similar to Noss Head and the Coquet Island. Mariners finding the bright lights becoming red haul to the eastward for safety.
301. Yes.
302. Perfectly distinct, red especially; can be seen any safe distance; white and red flash very good, but white seen much the farthest.
303. Nothing to particularize under this head.
306. Yes.
309. I am not.
310. Coloured lights cannot be seen at great distances, and in hazy weather are difficult to be distinguished from white lights.
313. Yes.—315. I do.—316. Yes, sufficiently distinguishable.
318. I do.—319. Yes.—320. Yes.—321. Yes.
322. I think they are sufficiently distinguishable.
323. No.
324. I have not been in the habit of passing coloured lights for many years.
325. At times lights are not discernible at the distance at which they are supposed to be seen, but it depends more on the atmosphere than on the colour of the light.
329. I found them discernible at a sufficient distance, and distinguishable from one another, and from white lights.
330. Yes.—331. Yes.
333. Generally so.
334. Yes.—336. Yes.—339. Yes.
341. The Tuskar is not the red light.
342. I have never found any difficulty.
343. Quite so.—347. Yes.
349. A red light is seen 15 miles off, and where it revolves from red to white it is very distinguishable. Vide Cape Della Zesta light (coast of Sardinia Island).
350. I consider them quite distinguishable.
352. Yes.—353. Yes.—354. Yes.
355. Not sufficiently distinguishable from white lights.
356. Yes.—357. Yes.
361. I have been in the habit of passing the lights both in the English and St. George's Channel, and say that any lighthouse showing a coloured light, either red or green, is discernible at a sufficient distance to avoid danger.
363. Yes.—364. Yes.
365. I have for years been passing the Tuskar light, in St. George's Channel, and think it a splendid light in every respect.
369. I do.
370. I think so.
373. Yes.—375. Yes.—376. Yes.
377. No experience.
381. Yes.—383. Yes.—385. Yes.
386. I think they generally answer the purpose very well.
388. This is difficult to reply to as regards all weathers.
389. Black Point light, in Anglesea, is very difficult to discern at times.
390. Yes; but I dislike coloured lights on account of their not being seen far; and white lights are often red in some states of the atmosphere, and would easily be mistaken for such.
391. Coming from the westward, Point Ayr light, at River Dee, might be taken for the N.W. lights, which would bring ships on West Hoyle Bank, as it often has done.
392. The coloured lights can be distinguished from the white lights.
393. Yes.—394. Yes.
395. Coloured lights are not distinguishable at a sufficient distance.
396. Quite so.—397. Yes.—398. Yes.
399. I would suggest revolving red lights.
400. I consider that any coloured lights which I am in the habit of passing are discernible at a sufficient distance, and are also sufficiently distinguishable from one another, and from white lights, in all weathers.
401. Coloured lights are seldom visible far. In thick weather they are not sufficiently distinguishable (except for local purposes, as harbour lights), and therefore are unfit for distant use.
402. Except in fog.
405. Yes.—406. Yes.—410. Yes.—411. Yes.—413. Yes.—414. Yes.
416. Found no difficulty for distance, nor for distinguishing.
417. I do.—418. Yes.—420. Yes.
423. White lights are seen furthest off, or blue light.
424. In thick or hazy weather they are oftentimes not distinguishable.
427. The coloured lights at the Tuskar are very fine.
429. Yes.—431. Yes.—432. Yes.—433. Yes.—434. Yes.—438. Yes.
440. I do not.
443. I think they are.
444. Yes.—445. Yes.—448. Yes.—449. Yes.—451. Yes.—452. Yes.—454. Yes.—457. Yes.—458. Yes.
459. I scarcely think they are discernible in hazy weather from white lights.
461. Yes.—462. Yes.—463. Yes.—466. Yes.—468. Yes.—472. Yes.
473. No.
474. I consider the coloured lights quite discernible at the sufficient distance, and distinguishable from the white or bright lights.
475. There is always a considerable doubt about a red light, unless a bright one is visible to compare it with. In hazy weather the brightest white light sometimes appears dark red.
476. Yes.—477. Yes.—478. Quite so.—480. Yes.
481. I do not think the present system of lighting, to distinguish one light from another, could be improved.
482. I have frequently passed coloured lights, and think them sufficiently discernible.
483. I think coloured lights are seen quite far enough off for all purposes for which they are intended, and with ordinary care are easily distinguished.
484. I consider that a red light is discernible at a sufficient distance, and distinguishable from white in all weathers.
485. Yes.
486. I consider white lights better than all others, in any weather.
487. I would suggest that Roche Point light, Queenstown, should be a good deal stronger, as the present one is a most miserable light in my opinion.
488. Yes. Coloured lights are not distinguishable from white lights in all weathers.
489. I do consider they are. Yes, so far as relating to red lights.
491. I think that coloured lights can be distinguished from white lights in all weathers.

492. I think not, in foggy weather.
 493. Yes.
 494. I think red lights are not discernible so far as bright lights are.
 495. I think they are discernible at a sufficient distance. I never found any difficulty in distinguishing coloured from white lights.
 496. Coloured lights cannot certainly be seen so far as a clear light; still the making sufficient distinction between the different lights being of even more importance than making them at a distance, it is doubtless very often judicious to have coloured lights. I have never found them otherwise.
 498. Yes.—499. Yes.—500. I do.
 501. I always found them to work well on the present principle.
 502. I consider quite discernible.
 504. Yes.
 505. Cannot say.
 507. Have known instances in which red was taken for white in snow; the result, the loss of the ship.
 509. Yes.—510. Yes.
 511. I have always found the coloured lights to answer the purpose intended.
 512. Yes.—514. Yes.—516. Yes.—517. Yes.
 518. In fogs bright lights appear of a red colour. I cannot suggest any improvement. No mistaking the Tuskar.
 519. No.
 521. I think sufficiently observable.
 522. Yes.
 525. Yes, they are discernible at a sufficient distance, and also from one another and from white lights.
 526. I have passed coloured lights. They are not so easily discernible as bright, but may be seen at a sufficient distance to warn off, and with moderate attention are easily distinguishable from other lights.
 527. I do, more especially the red light.
 528. Yes.—529. I do.
 530. It is impossible to distinguish them far off.
 533. Yes.—535. Very good.
 536. I am not in the habit of passing coloured lights in lighthouses.
 537. I would recommend that all coloured lights be made much stronger. I think they are quite distinct when once picked up.
 538. Coloured lights are only good as harbour lights, or to distinguish them from other near lights.
 539. I consider them sufficiently discernible.
 540. If possible, an improvement is desirable to make them more distinct under all circumstances.
 541. On referring to the Admiralty Chart, "Wreck lights and floating lights around the coast of Great Britain and Ireland, and channels," I consider the lights are sufficiently distinguishable from one another. Having been instrumental, with the late Marquis Downshire, by numerous memorials to the Trinity House and Ballast Office, Dublin, in 1837-41, succeeded in getting the present lighthouse erected on St. John's Point, Dundee Bay, lighted 1st May 1844. Instead of the present intermitting clear light, I would recommend red intermitting, as we have no such on the east coast of Ireland.
 542. I have not found any difficulty in distinguishing one from the other.
 543. I consider colours not easily distinguishable in certain states of the atmosphere and of the weather, and that, when practicable, the distinctions of fixed, revolving, flashing, are much better, and more dependable.
 544. Yes.
 545. I think they are right.
 549. Yes.
 552. The light at the entrance of Cork harbour is not very discernible.
 553. Quite so.
 554. Blackwater bank in hazy weather.
 555. Yes.—556. Yes.
 557. The lighthouses I have found sufficient, but the green light on the Brighton pierhead is very indifferent. The town lights are very brilliant, which often renders it hardly noticeable.
 558. I consider that the red lights, such as the Maplin, are excellent, and might be used more, with advantage, in floats where there are two lights.
 559. I do.
 562. I consider they answer the purpose admirably.
 564. All that I am acquainted with are quite sufficient in colour and distance.
 565. I have passed many lights in different parts of the world, and I think the red and the white lights are the best for all weathers and all purposes; therefore, I decidedly give them the preference.
 566. Yes.—567. Yes.
 568. I have found no difficulty in distinguishing them.
 569. Yes.
 570. Unless within a moderate distance, there is some difficulty in discerning coloured lights.
 571. I have never found difficulty in distinguishing the white from the coloured red light, and I do not think they can be mistaken.
 572. Have never experienced any difficulty.
 573. I consider red lights discernible at a sufficient distance; for instance, Roche's Point and Tuskar, revolving, two whites and a red, very good lights.
 574. Yes.
 577. Easily at about 6 miles.
 578. Coloured lights should always revolve, with a bright light in rotation or two to one, as Tuskar.
 579. I do.—580. Yes.
 581. They are sufficiently distinguishable from one another, and also from white lights, in all weathers.
 583. No.
 584. Coloured lights not easily discernible; useful only where a number of lights are close together.
 585. I do not consider coloured lights can be seen at a great distance.
 587. The red light on Devil's Island, near Halifax, Nova Scotia, is a very poor light for such an important position.
 588. Devil's Island light (red), entrance to Halifax harbour, a very poor light, and very indistinct.
 589. No.
 590. Have passed Plymouth breakwater light, on an average, twice per week for more than three years, and have found a deficiency of light in the same.
 591. Yes.
 592. If placed close to the water.
 593. The red colour is the most preferable.
 596. I never felt any difficulty in knowing one light from another.
 597. I do.
 598. If the power of the red light at Hastings could be increased so as to be seen 10 or 12 miles, and kept burning throughout the year, it would be a good mark for clearing the Sovereign Shoals to the eastward.
 599. I never have been deceived.
 601. I have made Tuskar light a very great number of times the last 26 years. I never felt at a loss to distinguish it when within range of the red face.
 603. No.
 604. All sufficiently discernible.
 605. Have no experience on the point.
 606. Yes, I believe so.
 607. Red lights ought to be improved if possible.
 608. Crosby shore light (red) is not discernible at a sufficient distance.
 609. The Rock light (red) is seen at a sufficient distance, but the Crosby shore light is not.
 610. Yes.
 611. They might be improved.
 612. I should like to see them improved.
 613. I think it would be a great advantage to have the Seven Stones and Longships lights higher, so that each light might be seen distinctly on opposite sides of that passage; for instance, the Seven Stones to be seen distinctly at the Longships, and the Longships at the Seven Stones.
 614. Generally not sufficiently discernible at a distance, but may be distinguished from any other.
 615. Crosby lighthouse shows a red light, which is not sufficiently distinct.
 616. The red lights of Crosby and Trwyn Dee Point (Beaumaris) are not discernible at a sufficient distance. Trwyn Dee light appears white instead of red in hazy or gloomy weather.
 618. Crosby light (red) is not discernible at a sufficient distance.
 619. The coloured lights are not seen as far as the bright ones; but, as a distinction, colours red and blue, are good.
 621. I do not suggest any improvement.
 622. Any coloured lights I pass are good.
 624. Yes.
 627. Scarcely sufficient distance. The red light on east end of Malta is very indistinct at a distance, while a white light would be perfectly bright and distinct. In some states of the atmosphere they are not easily distinguished.

632. I have generally found the lights on the English coast sufficient.
636. Red lights are sufficiently distinguishable from natural coloured ones, though not seen at so great a distance.
637. Yes, I think so.
638. With the exception of Pakefield all the other coloured lights that I am in the habit of passing I think very good.
639. I have had great difficulty in making out the red light at the entrance of Cork Harbour.
640. Not discernible at a sufficient distance, but sufficiently distinguishable.
642. Coloured lights are more difficult to make, but, where distance is not an object, they are useful to distinguish them from white lights.
643. Yes, generally.—644. Yes.
645. Unless in very clear weather I think that coloured lights cannot be properly and satisfactorily distinguished.
647. Yes.—648. Yes.—649. Yes.—650. Yes.
651. Atmospherical agency varies very much, and tends to bewilder and confuse seamen at night, and the navigator often neglects to sound, and thus, by finding a depth and taking a bearing of the light seen, he may verify his position of the ship and the character of the light.
652. Have never experienced difficulty in identifying lights from each other.
653. I cannot say that I approve of a coloured light singly, nor that they are distinguishable in all weathers.
654. I am, and do not.
657. I am not in the habit of passing lighthouses at present, but I always considered them visible in fair weather at a sufficient distance, and perfectly distinguishable from one another.
658. At the places I have seen coloured lights I have always found them answer well.
660. Have not been in the habit of passing coloured lights.
666. I think coloured lights are only fit for harbour purposes, as they cannot be seen far off.
667. I think white are the best and seen farther.
668. Yes.
671. During my service at sea I have never found a difficulty in distinguishing one light from the other.
572. Yes.—673. Yes.
674. Yes, so far as my experience goes.
675. Yes.
676. Plymouth breakwater is the only one I have passed often enough to give an opinion on, which, in my opinion, answers admirably.
679. Yes.—680. Yes.—683. Yes.
685. The red light next to the white light is distinguished at the greatest distance.
686. I think so.
688. Only bright and red.
689. Yes.—690. Yes.—591. Yes.
692. With where I am acquainted I think they are.
694. Yes.—697. Yes.—698. Yes.—700. Yes.
701. I am not in the habit.
702. I do.
704. I cannot offer any opinion excepting in the one instance of the light (red) on the Plymouth breakwater, which answers very well.
705. Yes.
707. I have not been in the habit of passing lighthouses the last 12 years.
708. Yes.
709. I do consider them sufficiently distinguishable.
710. I think it very desirable that a gun should be put on board the Kish lightship, and that gun fired every quarter of an hour during foggy weather. I also recommend the same to be placed on board the North-west lightship, Liverpool.
715. The Rock lighthouse, going into Liverpool, is the only one I am in the habit of passing, and that can always be discerned.
716. Yes.
718. I consider the before named efficient.
719. Efficient.
720. Yes, when clear.
721. I consider Roche's Tower light to be a very poor one; also Donayahada Harbour light near Belfast Lough.
722. I consider that they are.
723. Yes.
729. Where red and blue are shown.
730. I have not observed any objections where they are not required to be seen at a long distance, or that they are not easily distinguishable from one another (except green from blue), and from white lights at any time; it might cause mistakes to use blue and green for the same purposes.
732. Yes.
733. Coloured lights in hazy weather are at all times uncertain, even if seen.
737. The red lights (I have seen no other coloured lights) are not discernible at a sufficient distance; they should be strengthened; sufficiently distinguishable.
738. I think the coloured lights might be made stronger or more powerful.
741. Yes.
742. I think so.
745. For all weathers, I think a white light is the best.
747. The Southsea Castle light I have discerned without difficulty in passing when there have been many vessels anchored at Spithhead.
750. Coloured lights are not discernible in thick weather at a distance sufficient to give confidence in running for them.
754. All in St. George's Channel are.
755. Yes.—756. Yes.
759. Yes, quite distinguishable; but the more powerful and brilliant a red light can be made the better.
760. I do think they are. The Taskar light is, in my opinion, the best on all the coast of the United Kingdom.
762. In the harbour of Hong Kong the Peninsular and Oriental Company's hulk has a red light of no great power. This I have found very distinct from others in any weather.
763. Yes.
765. May be improved.
772. I know no coloured lights but red and white, and they are sufficiently distinguishable from each other.
773. At any reasonable distance they are sufficiently distinct. Light green or light blue should be avoided, unless within one mile of the object.
775. The only coloured light that I am in the habit of passing is the Bell Rock. I have never had any difficulty in distinguishing it from the other lights in that neighbourhood, and I have often seen it when it was just above the horizon. It is a splendid light in both its red and white faces.
776. I frequently pass Flamborough Head and Bell Rock, and I think them quite sufficient.
777. I think they are.
778. The South Foreland coloured is a great improvement.
779. Quite distinguishable.
782. Yes; red lights.
783. I do not think they are discernible at a sufficient distance, and would be glad to see them abolished altogether where it is possible to do without them.
784. Yes.
786. I have never had any difficulty in distinguishing the lights of the United Kingdom.
787. Loop Head and Inishere Island light are not, both having the same appearance.
789. White and green lights good; red bad.
25. If you have formed any opinion as to the comparative merits of each description of coloured Light (Red, Green, Blue, &c.) as regards their application to Lighthouses, and Floating Lights, state it.
1. Red appears to me to be the best colour.
 3. I decidedly give preference to red and to white lights as the most distinguishable.
 4. All coloured lights are difficult to be seen any distance with certainty, but red is the best of the three.
 5. I think red lights better than green, and green better than blue.
 6. Red is the best colour.
 7. No; I have not specially considered the subject.
 10. Red is the easiest to be distinguished.
 13. I consider a brilliant red or crimson the best colour. Green is not a good colour for distance, but does very well for narrow channels and distinguishing pier lights, provided more conspicuous lights lead to them from seaward. Bright red is also a good distinctive colour for lightvessels.
 14. I think the present very good.
 17. No.
 18. Cannot say, but prefer red to the other.

19. Red on shore, green at sea.
 20. I am of opinion that deep red lights are best.
 22. Red.
 23. Red.
 24. Red.
 25. Red.
 26. I am quite satisfied with the red and green lights at present.
 27. Red.
 28. Red.
 29. Blood red.
 30. Blood red.
 31. No, I have not.
 33. I think red and green lights would be seen further than any other coloured lights.
 34. The red light the best coloured light.
 36. I think red can be seen best and farthest off.
 39. I consider them all objectionable.
 40. Red.
 42. I think red.
 46. Red.
 47. I think red is best.
 49. Red.
 50. I think red is the best colour.
 51. Red and white.
 52. I have always been able to distinguish the red light before any other coloured light.
 55. A bright and red light, in my opinion, would be much better for steam ships than green.
 57. I have always been able to distinguish the red light before any other coloured light.
 59. Red is most distinguishable, but green may be seen the furthest distance.
 60. Red.
 61. I think red is the best discernible, green next, and blue last.
 63. I think the red is the best colour.
 64. I am of opinion that the red light is the best colour to be used in lighthouses and vessels.
 65. The red light is always more easily distinguishable than any other coloured light.
 66. Red.
 70. Red.
 71. Red.
 72. None.
 73. The red is best, for the green and blue blinds with the haze too much.
 75. Red is the best.
 76. Red and bright lights are discernible at the greatest distance.
 79. Red.
 84. I have not.—86. I have not.—87. None.
 88. Lighthouses white.
 90. None.
 97. Red is the most distinguishable.
 99. Red.
 100. No.
 101. I think red and white lights are easiest seen.
 102. Red.
 103. Red.
 106. Red.
 107. No.
 110. I prefer white lights.
 113. I think red the best.
 114. I think red the best as offering the greatest contrast to the common white light generally used.
 115. The red is seen at the greatest distance.
 118. No.—119. No.
 120. I have never formed any opinion.
 121. I consider the red light the best for both purposes.
 122. I think red is best seen.
 123. I have never formed any opinion.
 125. Bright red.
 126. No.
 127. I think red is the best colour.
 128. No, I have not.
 129. Green is the clearest.
 134. By my watchful attention to the South Foreland upper light, which shows a greenish hue, I should say that that and white are best; but white is best of all.
 106. None.
 138. White and red.
 139. Most certainly a white light is quicker discerned than a coloured, and at a greater distance. I have no preference for any colour.
 140. None.—142. No.
 143. The white light is the best.
 144. Cannot speak decidedly as to the comparative merits.
149. Of all coloured lights, I think red the best.
 150. Respecting colour, none is so distinguishable as red (white excepted).
 157. Red coloured lights.
 158. Believe red to be best.
 161. Opinion good.
 162. In my opinion white is seen at furthest distance.
 164. Their merit in the order mentioned.
 167. Red, in my opinion, is the best.
 168. Red.
 169. I am not much acquainted with the channel lights, being this 20 years in the foreign trade. The coloured lights I much approve of, for instance, Tuskar Rock; I have often been certain of my position by the second revolution.
 170. No.
 172. Have formed no opinion.
 178. Green.
 180. My opinion is, that coloured lights should never be used alone, if possible to avoid it, as they cannot be seen at so great a distance as a clear bright light. A bright and coloured light together is an excellent guide.
 181. Do not alter them.
 185. None.
 196. White light seen furthest off; green next greatest distance; red next greatest distance; blue, not able to distinguish it from green with any confidence.
 198. Never formed an opinion.
 199. Next to a bright light the red, in my opinion, is the best for seeing soonest.
 201. Yes; the South Foreland.
 207. Red is easily distinguished, but green and blue not so easy.
 208. Cannot say.
 212. Red.
 213. Red is next to bright in brilliancy, and is readily distinguished in all weather. Green and blue are useless, as they cannot readily be distinguished.
 217. I think red is the best distinguished, blue or green may be taken for bright.
 219. I think red lights preferable to any other coloured lights.
 220. I ascribe great merit to coloured lights in their application to lighthouses and floating lights.
 222. Bright.
 224. No.
 226. Red.
 227. Red, decidedly.
 228. I decidedly prefer red.
 229. No.
 230. Red is most easily distinguished, I think.
 231. I think red and white lights should only be used in floating lights.
 232. I think a red light preferable to any other coloured lights.
 233. None.
 234. I have not formed any opinion on this subject as regards the different colours, &c., except that blue lights should be exhibited, as a general rule, from all lighthouses, lightships, sailing or steam ships, to any other ship or vessel approaching or going into danger, under a penalty by law for the same.
 236. All depends in position placed.
 237. Only change the colour of the white, every thing else is as good as can be.
 242. No.
 244. White in most cases, except where the light is surrounded by shipping, should suggest a coloured light.
 247. Red is best.
 248. Red lights are more observable than blue or green.
 249. Green.
 250. I am of opinion that light and red colours are the best to be seen at a distance.
 251. Having no opinion of the blue, of the red and green I should prefer the last.
 252. Of coloured lights I have always found red to be the best.
 255. Bright lights best for distance.
 256. It is my opinion that the red is the most suitable.
 258. Red, best.
 259. Red I think the best.
 263. Green and red are good, blue not good.
 264. None.
 274. I have not formed any opinion.
 275. Red is best distinguished.
 276. Think red.
 278. Have never formed an opinion.
 279. Red far preferable to green or blue.

280. I prefer red.
 282. Red, best.
 283. Red is the easiest defined by the eye.
 284. Green.
 285. Green or blue should only be used when other lights are burning; where the position is certain and distance short, as at bar harbours.
 287. For general purposes red is the best colour.
 288. I have never formed any decided opinion as to the comparative merits of coloured lights, but think red the most distinguishable colour.
 291. I think it more distinctive, and can be seen at a greater distance.
 292. I consider the redlight, such as those at the Gunfleet or Maplin lighthouses, preferable to blue or green.
 297. Bright white is furthest seen.
 299. Red light is better than green, as far as my opinion goes, and green to be chosen before blue; but the whole may be required for the navigation of intricate channels, where many lights are required.
 301. Red and blue are the easiest to be distinguished.
 302. Red, the best; am of opinion that sufficient difference can be made by white and red.
 303. Nothing to particularize under this head.
 309. The green lights are of too pale a colour.
 310. Red is by very far the best of coloured lights; green, hard to be distinguished from white.
 313. Red.
 315. I have not.
 316. It is my decided opinion that red is best.
 317. Red, I think, is by far the best.
 320. Red is very distinguishable.
 322. My opinion is, a white light may be distinguished at the greatest distance.
 323. None.—324. No.
 329. I consider red the best.
 330. No.
 332. Red.
 334. I think you would see red furthest off of the three.
 336. Red light is best seen.
 343. I consider a red light is discernible at a greater distance than any other, and green and blue are too much alike at first sight.
 344. Bright light.
 346. Red.
 347. Red is better than either green or blue, that is, more distinguishable from a white light.
 348. Green is seen further off by me than either red or blue.
 349. Red is best.
 350. I have not.—352. I have not.
 354. I have not formed any opinion.
 355. No.—356. No.
 356. Bright seen at greatest distance, and I think red next.
 363. I consider that red and bright lights are best.
 364. Red and green best colour.
 365. I think red the best.
 370. I would give red the preference.
 372. Red best; green or blue easily mistaken for bright.
 373. I consider red better seen in the distance than green or blue of a decided colour. There is no system of lighting can surpass that on the north side of the Thames, from the Hook of the Gunfleet to Mucking Flat. 20 years ago it was the most difficult bit of navigation in the night I know of, now it is as safe at night as day. But it has one drawback, especially for sailing ships, and that is, the bright anchor-light of ships riding.
 377. See No. 24.
 383. I consider that a red light is seen at a greater distance than green or blue.
 385. Red, in my opinion, is the best.
 386. I have not sufficiently studied this subject.
 388. Blue and green lights I consider bad to see on account of the atmosphere, being of the same colours.
 390. Red is the best of the three. Blue and green lights are very indistinct as to colour, at even a short distance.
 391. Not any.—393. No.
 395. Blue is best.
 396. Red best.
 397. I think red the most discernible.
 398. Red, for that is seen at the greatest distance.
 399. Red.
 401. Coloured lights being above considered applicable only for harbour, or limited use, it need only be added that red is seen further than blue or green (as a coloured light) though the latter are visible further as a white light.
 402. Red light decidedly best.
 405. Red.
 406. Red.
410. Yes.
 411. I think Red the best.
 414. White lights are the best.
 416. I should think red best.
 418. Red and green.
 419. Green.
 420. No.
 423. Red lights are seen at much shorter distance than white or blue lights.
 427. The red light is perceptible at a greater distance I think than the green or blue.
 429. I have often had great difficulty in discerning a green light from a bright one.
 431. Red.
 432. Red and green are good lights.
 433. Red the best in my opinion.
 434. Red.
 440. No.
 445. Red.
 449. None.—451. No.—452. No.
 454. Red.
 456. Red the best.
 457. No.
 458. Red.
 461. No.
 462. Consider bright lights the best when practicable.
 469. Red and white.
 471. No.—472. None.
 473. Red preferred, green or blue apt to be mistaken for bright at a distance.
 474. In coloured lights I have always found the green to show the greatest distance.
 475. Red, green, and blue should not be used, but bright lights, only varied by flashes or revolutions above or below the fixed lights.
 476. During my experience on the Peninsular line, I found the red flash light at Cadiz at all times visible at a great distance.
 478. No.—480. No.
 482. I think the white and red should take the precedence of other colours, green and blue approximate too much (at a distance off).
 483. I have not, except as regards those in sailing ships, which I conceive will lead to collisions.
 484. Red is the easiest to distinguish, green or blue cannot be distinguished from each other or from a bright light at any great distance.
 485. Red and white.
 486. I have not.
 487. Red.
 488. Bright red.
 489. I am of opinion the blue coloured reflectors are the least distinguishable.
 492. No.
 493. Red and green are very proper, blue in thick weather approaches too near in colour to white.
 494. I cannot form an opinion.
 495. I would suggest the adoption of either green or blue light, but not both, as there is much difficulty in distinguishing one from the other, even in fine clear weather. White, red, and green, or white, red, and blue.
 497. Red is far preferable to any other.
 498. I prefer a brilliant white, as it shows better in hazy weather.
 499. No colour seen so well as red and bright white, under all circumstances; green and blue being weak, and not easily known from bright in moderately thick weather.
 501. I could think of no change but what would tend to confusion.
 505. Nil.
 507. Think red, next to white, but should be used separately.
 509. No.
 510. Consider it advisable, if possible, that coloured lights should be made visible at greater distances.
 511. No.
 512. In my opinion, red.
 516. Red is seen the best. Green and blue, at any distance, appears nearly white, particularly in hazy or wet weather.
 518. I think red best.
 519. None.
 522. Red lights are seen farthest.
 524. We see green much further than red. I refer now to the red lights of steamers; the same will apply to lighthouses.
 525. Red lights are generally seen best.
 526. Natural bright light is of course best, after which red shows best; green or blue rank next. It is difficult to find any other good distinguishing colour.
 527. White and red.

529. I think a red light the best.
 530. Bright and red lights.
 531. I have not.
 533. Red.
 536. Not formed any opinion.
 537. I have formed no opinion.
 540. Red, where it can be applied.
 541. I have not had experience of late, to give an opinion as to the merits of such lights.
 544. Red.
 545. I have not.—549. No.
 551. Red is best seen, next green, then blue.
 552. No.
 553. Cannot form an opinion.
 554. Red, green, bright.
 557. The red light is best seen.
 558. Red, certainly, first; as an auxiliary, light green may be occasionally used.
 565. I decidedly give the preference to all white and red lights in all lightships and lighthouses.
 569. No.
 571. From experiments that I have seen tried with variously coloured glasses, at Pillau, in Prussia, I am of opinion that the only coloured glass, most efficient, is the red one, as regards the application thereof to sea lights.
 573. I consider red best. I should think it difficult to determine between green and blue, any distance, in hazy weather.
 577. I should say red is best.
 578. Red is the best for British atmosphere.
 579. Ever since coloured lights were first introduced into steamers, I have in all cases observed the red before the green. (See *Appendix to Mariners' Evidence*, p. 579.)
 583. Green seen further than red, but some are bad to distinguish from bright.
 584. Red.
 585. There is this great objection to all coloured lights,—that some persons, owing to a defect in the optic nerve, cannot distinguish one from the other.
 589. In general coloured lights are objectionable, but in particular cases may be used, where distance is no object.
 590. Red is superior to either blue or green.
 591. I have no opinion to offer.
 593. Red.
 597. Never have.—598. No.
 599. Red most easily distinguished.
 601. I hope we shall never have any green, much less blue coloured lights, either in a lighthouse or lightship.
 602. Blue would distinguish from all sea lights on board vessels.
 603. Blue.
 604. I have never formed an opinion.—605. No.
 606. Red.
 607. Red.
 608. Red.
 609. Blue or green are better than red.
 610. Red.
 611. Red.
 612. Red.
 613. I consider a bright red the best, as it will show so much stronger than any other light, especially in foggy weather. Green I consider a very indifferent light, unless of large size, and with powerful reflectors. A steamer's red light is always seen first, and when seen is much brighter than the green, although both of the same size.
 618. I think red best.
 621. Lighthouses, red or white; lightships, red.
 622. I think red the best.
 624. Green or blue would be objectionable.
 625. I think, for a lighthouse, red the only discernible colour.
 627. Red is the most difficult to see, and not seen at all the same distance as white.
 628. Red.
 629. Red is preferable to either green or blue, as I have experienced from Flamborough Head.
 630. Red before either green or blue.
 636. I would prefer red, when a distinguishing colour is required.
 637. I think red gives the best; green decidedly the worst.
 638. Of coloured lights I think that red is best.
 639. I do not like any coloured light for a lighthouse or float.
 641. The red is generally made too dark; the green is too blue in tinge, and almost useless in consequence of being visible so short a distance. A yellow green and a yellow red are visible much farther than other colours. Blue only darkens light.
642. Consider that a good red light for floating lights the best of the coloured lights, and applicable to light-houses, particularly for harbours or roadsteads.
 643. I have not formed an opinion hereon.
 644. White light seen farthest.
 645. I think the colours should be confined to red and green. Blue, at a distance, would be easily mistaken for green.
 647. Red is seen at the greatest distance.
 650. Red.
 651. My conclusion is, that there is much difficulty in making out the colour of a light at sea in a "nasty night."
 652. Red, green, and blue have their respective merits, but the two latter should be always widely separated, as there is an affinity between the two which may lead to error.
 653. I think that a blue light would be the best distinguishing colour in narrow channels, much frequented, —red and green being ships' signals.
 654. Red, dark and bright.
 657. I consider a bright or white light can always be seen at a greater distance than a coloured one.
 658. All colours are equally good, provided they have equal brilliancy.
 660. Red.
 666. I have not formed an opinion.
 667. I prefer red and green to blue.
 668. I think red is the most easily distinguished.
 671. I think, where it can be done without interfering with other lights, a bright red best to distinguish.
 672. Red is best, where distinction is required from a bright light.
 673. Red is best.
 675. Red.
 676. I have not.
 678. I should prefer the red light. The green light, at a great distance, can scarcely be distinguished from a white light.
 679. No.
 680. Bright red is the best.
 683. I should prefer a red light to either green or blue.
 685. I consider the red light is most readily distinguished as a colour at night.
 686. Bright and red are easy to distinguish from each other, but green and blue not so distinguishable above two miles distance; at three miles distance they are easily distinguishable.
 687. White and red I consider the best.
 688. Bright and red the best.
 689. Red.
 690. Green.
 691. Have not formed an opinion.
 692. Red, in my opinion, is the best.
 693. Red is the most conspicuous.
 694. Bright red.
 696. I consider red preferable.
 697. I think red the best; some give the preference to white, but I think the atmosphere has a great deal to do with it.
 698. No.
 699. Red is the best, then green, and lastly white.
 700. I should prefer a red light to either green or blue.
 702. Red and green.
 704. I have not.
 705. A bright light is best for a long distance; for a short distance, red is better than green or blue.
 707. No.
 708. Red.
 709. I think red the best.
 714. White and red best.
 715. I consider green and blue bad colours.
 716. White and red best.
 718. I have formed no opinion.
 722. I consider that a bright light can be seen furthest.
 723. Green is very bad colour, it being a receding light.
 726. Red is the most discernible, but is more liable to be mistaken at a distance for a white light than blue or green.
 728. Dark red standing, and flash white.
 729. No.
 730. In my opinion red is the best coloured light for the coast. Blue might be used for harbour purposes and inner channels in preference to green, to prevent being mistaken for ships' lights.
 733. All coloured lights should be avoided, if possible, in difficult navigation; and, in my experience, red is the worst description.
 737. Red.

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Question

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738. I think the white and red lights the best.
 741. No.
 744. My impression is in favour of red.
 745. Of all coloured lights I think red is the best.
 747. I think this depends on the density of colour, if both alike in that respect, I believe red to be the best. Blue I have not seen in use.
 750. Red is the best of the three.
 751. Red and green.
 753. Green and blue lights bad and deceptive in hazy weather.
 754. I have never formed an opinion; either, as used, one sufficiently conspicuous.
 755. No.—756. No.
 758. Red.
 759. White and red are most distinguishable, as blue or green may be mistaken for white in hazy weather.
 760. I am of opinion that a red light is better distinguished from a bright light than any other colour.
 762. No experience.
 763. I consider red is the most readily discerned, next green; but blue may be mistaken for green.
 765. Green.
 769. From experience I find white, red, and blue the best lights to be used for all purposes.
 770. The green at a distance may be mistaken for white if hazy.
 772. No.
 773. See Answer to 24.
 775. I think that red is the best, and green the next best; and I think that it is quite safe to use red in any lighthouse or lightship, but green should only be used when no more than a radius of five or six miles is required; I have never, however, seen a first-class green light.
 777. I think the red lights are the best.
 778. Blue and red is the most distinguishable.
 782. Red, as most distinct in all states of the atmosphere.
 784. I think their merits, in the order of the question, red green, blue.
 786. Red first, green next, for a short distance, to clear the danger, say six to eight miles.
 789. White and green lights good; red bad.
 790. I am of opinion that a good red light can be seen further than any other light in foggy or rainy weather, and a bright light in clear weather.
 791. I prefer red and white.
 792. Red and white.
 793. Red and white.
26. If you are acquainted with any system of colouring Lighthouses or Lightships by which they are easily seen and readily identified, describe the system.
3. I know of none better than the present system, that of lightships red and lighthouses (with but very few exceptions) white.
 4. I think the colour quite unimportant.
 5. I am acquainted with no system better than at present adopted for the identification of lighthouses or lightships either by night or day.
 7. No.
 8. Lateral bands of red and white or black and white for lighthouses. The system of painting lightvessels red approved of.
 10. Lighthouses should be painted white, with one or more red stripes (horizontal) round them, and lightships painted red.
 12. The red and white horizontal bands recently placed on the Eddystone distinguish it very clearly.
 13. For lighthouses that are seen under the land, white is the best colour but for those that crown the summit of a hill or island, and show against the sky, a dark colour is preferable; a sufficient breadth of white in the walls or buildings would distinguish it from local signal towers. I have frequently been unable to see white lighthouses placed as above.
 14. I think the present colour, red, very good.
 15. No.—17. I am not.
 18. Red in general for ships, and white on shore, with black stripe when in lead for beacons.
 19. White lighthouse, red lightship.
 20. I know of none better than the colours now used.

II.

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21. No.
 22. Lighthouse white, lightship red.
 23. None better than the colour now used.
 24. Red.
 25. None better than the colour now used.
 26. I think that white lighthouses are best, and red painted lightships.
 27. None better.
 28. None better.
 29. None better than the colour now used.
 30. None better than the colour now used.
 31. I am not.
 33. I think the present colour for lighthouses and lightships the best.
 34. White lighthouses are best seen.
 36. I believe Dungeness is the best colour that can be painted, namely, red.
 39. I think the English very good.
 40. Red lighthouses and lightships are best to be identified.
 42. I am not.
 44. Lighthouses red or white, lightships all red.
 46. Red.
 49. Gong.
 50. I am not.
 51. The present system, red for ship and white for lighthouse, is preferable.
 54. The plan of painting lightships red is the best.
 55. I am not.
 59. Lighthouse white, lightship red.
 60. None better than the colour now used.
 64. I am of opinion that red is the best colour for lightships.
 66. Red lighthouses and lightships are best to be identified.
 67. I consider those coloured red to be seen at the greatest distance.
 70. Red lighthouses and lightships are best to be identified.
 71. None better.
 73. For lighthouses, such as the Eddystone, the red and white horizontal; for lightships, red; and for shore lighthouses, white.
 76. No.—77. No alteration required.
 79. Red.
 80. Lighthouses white, lightvessels red.
 84. I am not.—86. I am not.
 87. Black or red.
 88. Lighthouses white, lightships red.
 90. Black or red.
 91. I should prefer two distinguishing colours instead of one for most seamarks, as from various causes, such as the background, and state of the atmosphere, one colour would at times be more readily recognized than another, as black and white, red and white; the colouring should, however, be made, as far as practicable, subservient to a general system of uniformity.
 92. Not acquainted.
 94. I think all lightships should be painted red, and have a ball at mainmast-head during daytime. Lighthouses, I think, should be white, but where it is necessary to distinguish them it should be with black or red distinguishing marks over a white ground.
 97. I know of none better than the present system.
 98. White houses are best.
 100. No.
 102. Red and white.
 103. White is more easily discerned in foggy or hazy weather, and red in other states of the atmosphere. Broad bands of alternate red and white I am of opinion would be more efficient.
 106. No.—107. No.
 108. My opinion is, red.
 113. I am not.
 114. I think a bright red the best colour for both, as they would be more easily distinguished from surrounding objects.
 115. I am not.—118. No.—119. No.—120. I am not.
 121. I consider red and white stripes the most readily identified in hazy or foggy weather.
 122. No.—123. I am not.
 125. Lighthouse white, lightship red.
 126. No.
 128. The present system.
 129. No.
 134. I think there can be no improvement in the present system.
 136. Best red.
 139. No.
 140. None better than red.

142. No.—143. No improvement.—144. No.—149. Not acquainted.
150. None better than red.
161. House white, ship black.
162. No.
163. White lighthouses and ships red.
167. No.—170. No.—172. Am not.
180. I am not particularly acquainted with any.
181. English best.
195. I think the present system of red ships and white lightships are very good.
198. None.—208. None.
213. Horizontal stripes of red and white of equal breadth are readily seen and identified.
217. Lighthouses are best white, lightships red, as they are.
218. Lighthouses are best seen white, lightvessels are best seen when painted red.
219. I think that if the balls which are hoisted to the masthead of lightvessels were painted black, would be seen at longer distance.
220. Not acquainted with any system but the painting lightships red, but consider that two colours are better than one—different colours for different ships and houses.
221. Lighthouses white and lightships red.
224. No.
226. Red.
228. I think the colour our lightships are painted suitable and good. Lighthouses should be painted different colours—black, white, and red; some one of these colours, others two or three colours to distinguish; some chequered, so as they could not be mistaken.
229. No.
232. I think, by having the ball at the masthead of the lightships black instead of red, it would be seen at a much greater distance.
233. No.
234. I think there can be no better system than the present red lightships and white lighthouses.
235. None more than the present system in use.
237. The present system is good; 100 different shipmasters would have 50 different colours.
242. Not acquainted with any particular system.
244. Red, as now used requires no alteration, it is good in all cases.
247. I cannot.
249. Lighthouse white, lightship black.
250. Lighthouses above the land they are best in white; lightships are best in black or deep red.
251. With none whatever.
255. Black.
256. Lighthouses white, and lightships red.
257. Lightships red.
260. Not acquainted.
262. A lighthouse painted white appears to me to be the best; red is, perhaps, the best colour for a lightship.
263. Half white and half light red.
269. Red.
274. Not acquainted.
275. As at present.
276. No.
279. I know of no better plan than that already adopted.
281. Bright red.
282. Lighthouses seen against high land white, on low projecting points or insulated rocks dark, varied by bands to distinguish them. I would discountenance the practice of whitewashing lighthouse rocks to the water's edge; they cannot be seen in hazy weather.
283. I think the present system adopted on the British coasts as perfect as it can be made.
284. Red for ships, and white for houses.
285. That already in use is very good.
287. White is the best for lighthouses, and black for light ships.
288. I am not acquainted.
291. I am not acquainted with any particular system, but I think alternate colours of black and white, horizontally and vertically, may be introduced advantageously.
292. I know of none better than the present system.
301. The present system I consider good.
302. Good lights, good reflectors, clean glass.
303. I am not.
311. Red.
315. I should say red.
316. Lighthouses white and lightships a bright red.
319. Red is the most discernible.
320. The present system I think very good.
322. A lighthouse white, a lightship red or black.
323. No.—324. No.
326. I think the present system (red) good.
329. I am not acquainted with the system.
330. No.—331. No.
334. I think white.
336. Lighthouse, white is best seen; floating lightships red, as they now are.
338. Lightships red.
339. As at Clause 21.
343. I think lighthouses might have their names so arranged to be of service.
346. Red and white.
348. By colouring them either red or white.
349. No.—350. I am not.—352. I have not.
354. Cannot describe the system.
355. No.—356. No.
361. The lighthouses that I have discerned first of all from spires and steeples are those white, with red belts, or white and red stripes.
363. I do not think that any colouring can be better than the present.
364. Every lighthouse and light painted differently with black and white, some horizontal, some oblique, some chequered.
370. Red, by all means.
372. White for lighthouses, red for lightships.
373. I am not.
375. I would say such lighthouses as Tuskar, Smalls, Eddystone, and such like towers would appear more discernible a dark colour, say red.
377. No.
381. Red.
386. I think red and white are best seen.
387. Red is the best seen.
388. I would recommend lighthouses to be painted perpendicularly, to show half white and half black, which would accommodate two states of the atmosphere.
389. Lighthouses on rocks, such as Eddystone and Smalls, would be more readily distinguished from a vessel under canvas if painted blue or black. Lightships, I think, are best red.
390. I am not acquainted with any system differing from that used in England.
391. Red.
394. The way the Maiden Rocks lighthouses are painted, in my opinion, is seen sooner than if all white.
395. Broad belts of different colours.
396. I know nothing better than red.
398. Blue for floating lights and white for lighthouses.
399. I have always found red best.
401. Red, red and white, black and white, or either colour, according to the locality, and perhaps the usual background.
402. None.
405. Houses white, ships red.
406. No.—410. No.
418. White.
420. No.—429. No.
431. White for lighthouses, dark for lightships.
434. Red and white.
440. No.—445. I am not.
447. Lighthouse white, ship black.
448. White for lighthouses.
449. Nonr.—451. No.—452. No.—457. No.
460. As they are at present time.
461. No.
462. Consider the present system of painting lightships red the best, on account of their being more easily distinguished.
469. White lighthouse, red lightship.
470. Red.
472. No; I never found any difficulty in making them out.
473. White for lighthouses, red for lightships.
474. I cannot describe any better than the present general system, the white lighthouse and the red lightship.
475. Lighthouses should be white, ships light red, with a ball by day.
478. No.—480. No.
482. I think there can be no better colour for lighthouses than white, or red for lightships, especially if no other vessels are allowed to assume the same colour.
483. I am not.—485. No.
486. No more than being 'painted in different' colours, striped horizontally or vertically.
487. I am not, better than they are at present.
488. The colouring of lighthouses ought to depend somewhat on the groundwork colour they were built on;

- but, as a rule, I think white the best for a lighthouse, and black and red for a lightship.
492. I am not.
493. The Tuskar, off the Wexford coast, is very distinct.
494. I am not acquainted with any system better than at present adopted.
496. I think an improvement could be made in the colouring of lighthouses, for instance, one could be painted black and white, bands horizontally; and another black and white bands vertically; a third white, and so keep changing them that it would be next to impossible to mistake one for the other, particularly if the painting was regularly attended to; I have passed Dungeness lighthouse when it was next to impossible to tell what colour it was at three miles.
498. White for both appears to me the best, with occasional rings or checkers on them.
499. None.
501. I would recommend red and white to be more used.
502. Think lightships could not be better coloured than at present.
505. Nil.—509. No.—510. No.
511. Red.
512. I am not acquainted with any system. I think if Eddystone were coloured like Dungeness, it would be more readily distinguished. The lightships are easily distinguished by their masts and balls.
515. White.
518. I consider chequered lighthouses seen furthest off.
519. Not better than at present.
521. I would suggest that lightvessels should vary in colour according to their different stations. Say, for instance, the Newarp painted black and white; ships would (in case of foggy weather, and not able to see the land), in coming in with those so described, know their position exactly diagonally.
524. Lighthouses should not all be white. There is, I believe, a difference in the paint of the lighthouses on Scilly and the Eddystone. In a fog and when near, by seeing any kind of distinctive mark, we should know where and what lighthouse it is.
526. Lighthouses should be painted white, lightships red, with white letters, in good colours. It would be well, when many lightships are together, to distinguish them by other colours.
527. I am not acquainted with any other system than now in use.
528. No remark.
530. Lighthouses white, and lightships red.
531. I am not.
533. Red lightships, and white lighthouses.
536. The present system I consider very good.
537. I would colour lighthouses on shore white, and in the sea, if surrounded by water, black or red.
540. Not acquainted with any system, but suggest that all lighthouses be white, and lightships red.
541. Stone colour or white.
544. No.—549. No.
552. I think the green, if not too bright; but the red is a good colour when bright.
558. White should be used where there is a dark background, as hills, &c; black and white, striped, when seen against the sky.
564. No; but I think the present system of colouring lightvessels is one by which they can be easily seen and identified.
565. All lighthouses ought to be all white, and all the walls and outhouses about them. All lightships ought to be all red, with their names on both sides.
567. Cannot be better than at present.
569. Do not know any.
471. The system of colouring lighthouses and lightvessels, as used in England, I find extended all over the world, and find it quite efficient.
573. I consider that lighthouses are best seen white, when the land appears above in the background; but such as Dungeness, and False Point (Bay of Bengal), would be best red, with vertical or horizontal stripes.
577. None.
579. See answer to Question 21 in the Appendix. (*Appendix to Mariners' Evidence*, p. 579.)
583. With land intervening lighthouses should be white; if placed on rocks, at sea, should be dark colour.
589. I am not acquainted.
591. Unacquainted.
593. For lighthouses, I prefer cream colour; for lightships, red, with white stripes.
597. None.
598. As a rule, I think all lighthouses should be white, and lightvessels and beacons red.
599. In most all states of the atmosphere I think white as good as any.
610. I think painting Tuskar lighthouse red would be an excellent mark, also as well as seen better. We have known the Hook Tower, at Waterford, mistaken for Tuskar. Dungeness lighthouse was painted red, I believe, in 1827 or 1828. St. Allardin's day-mark, in Scilly, is red, or was; and I would like to see one of the Maiden lighthouses all red. The large ball at the mast-head of the lightships I have often found very serviceable in hazy weather. It can be seen a long way. I have seen it from the deck, and could not see the hull from the mast-head. This was owing to fog lying quite thick. This is of rare occurrence.
602. Depends on the part of the coast, whether there are houses about or near the lighthouse, and the colour they are mostly painted.
604. No better than the present.
605. Red being the colour easiest seen in hazy weather, I think red and white, or red and black, might be used advantageously at distances apart sufficiently great to prevent mistakes.
606. White lighthouse, and red lightship.
610. No, except contrast.
612. The system of contrast.
613. I think nothing can be better than the white lighthouses and red lightvessels, as at present in use; in running for the harbour of Sierra Leone during the Harmattan season, when it is very foggy, I have invariably seen the white lighthouse at the distance of six or seven miles before seeing the high land immediately behind it.
614. The greater contrast with surrounding objects the better.
615. No; but the colours should vary, so as to make the strongest contrast with the surrounding land or water.
616. Black, as a general rule, is best for lightships. The colour of lighthouses should be light on dark land, and dark on light coloured or low land.
618. Black for a lightship. The colour of lighthouses should vary, so as to contrast them as much as possible with surrounding objects.
621. I am not.
622. I think red is best seen in hazy weather. If Carlingford lighthouse was red, instead of white, I would often see it quicker than at present.
623. Bright red most distinct, generally speaking.
629. All lighthouses are more easily made out coloured red than white; lightships the same.
630. All lighthouses and lightships should be coloured red; they are easier seen than white.
633. Houses, white; ships, red.
636. I consider white for lighthouses most conspicuous, and red for lightships, with name of shoal painted in white letters on side.
638. I think that red is unquestionably the best colour for lightvessels, and no other vessel should be allowed to paint in that colour. For lighthouses, much will depend on their locality, and also their vicinity with respect to other buildings.
639. No.
640. I think lighthouses should vary in colour, and be striped, in some instances, to distinguish them from one another. Lightvessels would be better black.
644. No better than what is adopted.
645. All the lightships that I have seen are coloured red.
649. Nothing better than red for vessels, and horizontal stripes or bands for houses.
550. Bright red or white.
651. Lighthouse best seen and best distinguished, on land, in hazy weather, if white; and I may add that, since the Eddystone lighthouse has been painted red and white, in alternate belts, it is much easier made out.
652. Chequered black and white.
654. Red, or red, white, and black, or any other colour to distinguish.
657. I am not acquainted with any particular system, but I would suggest black for lighthouses, and some very dark colour for lightvessels.
660. Am not acquainted.
666. I know of none better than the present.
668. I am not.
671. I am of opinion that red is the best colour of lighthouses, varying it with red and white horizontally, as requisite.
672. None other than are in use.

674. I know of no better plan than the present system.
 675. No.
 676. In my opinion red is best for lightvessels, and white for lighthouses.
 679. No.
 680. Those striped red and white are most readily identified.
 685. No.
 686. I could state such a system, but not concise enough for this paper.
 687. Lightvessels would be more readily identified by having one, two, or three masts, which can be seen in daylight at times before the vessel's hull.
 688. White the most conspicuous for lighthouses, and red for lightships.
 691. Am not acquainted.
 692. Not any.
 694. Striped red and white.
 697. Not acquainted.
 698. No.
 699. Red and white, or black and white, is the best.
 701. The red colouring system in use by our Trinity Board.
 702. White.
 703. Lighthouse, white; lightvessel, red.
 704. Red is the best colour for ships, and I think white for houses.
 705. Answered in Question 21, with lighthouse. Lightships are best coloured red, as at present.
 707. No.—709. I am not.—715. I am not.
 718. I have formed no opinion.
 719. None.
 722. I am not acquainted with any.
 728. I should think red preferable to white for lighthouses, the same for lightships.
 729. No.
 730. I have thought that all lighthouses should be painted in a uniform manner, so as to be easily distinguished from other buildings; they are built in all shapes, and some among other buildings. Strangers may have difficulty in making some easily out. Say two colours, red and white, and some distinguishing mark on the top; they might also be lettered, or numbered on each coast; floating lights, three colours, as they are placed on the coast, and lettered or numbered.
 733. None better than that already adopted.
 736. Lighthouses with no background should be black; with dark background, white. Lightships should be black or red, with a large cage at the masthead; also black or red. White is not easily distinguished, or other light colour.
 738. I think white the best for high lighthouses, and red for low lighthouses and lightships.
 741. No.
 743. At New Brunswick, North America, lighthouses are painted in stripes, black or red, vertical, diagonal, horizontal, or crossed.
 744. I conceive, as I have already stated regarding buoys, that red or black and white stripes might in many places be a great advantage. I have on several occasions, upon grey mornings, approached to within a few miles (say from seven to four) of the entrance to the harbour of Port de Galle, Ceylon, without seeing the lighthouse, although I have seen all the time the point upon which it stands, and the rocks off it, and been much perplexed thereby, until a gleam of sunshine or brighter light falling upon it has suddenly made it brightly visible. Its colour is white, which, however, rapidly loses brilliancy, and becomes grey here, as in most climates.
 748. White.
 752. White.
 754. Know of no better system than is used in Great Britain.
 755. Red and white.
 756. White.
 758. Lightvessels red, and in England the lower part of the light towers red, to contrast with the snow in winter.
 759. Dark red appears a good discernible and distinguishable colour.
 760. I am not acquainted with any particular system, but am of opinion that if lightships were chequered largely black and white they would be more readily identified than by being one uniform colour.
 761. Chequering or striping them (see sketch attached) would render them more easily distinguished.
 762. Not sufficiently acquainted with the subject.
 767. Lighthouse white, if it stands against a dark background; red, if on a beach; lightships, red.
769. I consider the best colour for lighthouses and ships a light yellow, more especially lightships; they ought not to be black or red, as they are at present; the red goes dark, and cannot be seen from any other colour.
 772. No.
 773. This much depends upon the character of the weather; as, for instance, if in sunshine, white buildings are generally seen first; but I think the present colour of the vessels (red) cannot be improved.
 775. Lighthouses and lightships that are surrounded by water, and have nothing but the sky for a background, should be of a dark colour, and I think that red is the best, because it is as easily seen as any other, and because it is the best to distinguish a lightship from any other vessel that might be in its neighbourhood.
 777. I do not know any.
 778. Red.
 786. I would suggest red, or red and black striped.
 789. No, I should think black or red the best.
 790. Where the land is low and the lighthouse is the first object seen, in my opinion it should be black, but where the land is high and the lighthouse placed between the land and the sea, on some low rock, it should be white.
27. What system of Fog Signals applicable to Lighthouses and Floating Lights in use in this or Foreign Countries do you think best?—Describe it.
1. I do not know of any better than the gongs.
 3. I know of none better than are used in the United Kingdom.
 4. I think the gong the best fog signal in present use.
 5. I think none better than at present used.
 6. The gongs.
 7. I think our own sufficiently good for all practical purposes.
 10. A bell is best heard.
 14. I think the gong.
 16. The gong.
 17. Those now in use.
 18. Cannot say.
 19. A gun or bell on shore, a gun afloat.
 20. I think the gong.
 21. As they are.
 22. Bells or gongs.
 23. Gongs.
 24. The gong.
 25. Gong.
 26. I think the bell in lighthouses, and the gong in lightships.
 27. Gong.
 28. Gong.
 29. Gong.
 30. Gong.
 31. Our present system of gongs.
 32. The gong, and firing a gun every fifteen minutes.
 33. The gong, as now used, is very good, if there could be something done to show what light or lighthouse it is.
 36. I cannot propose anything better than what is in use now, but where there is much traffic there should be no cessation.
 40. Gongs.
 42. A gong.
 43. Gun.
 44. The gong.
 45. English system.
 46. Gong.
 47. The Chinese gong is now in general use on our coast, and I think is best.
 50. I do not know of any better than the gongs, as they can be heard at a considerable distance.
 51. A gong in lightships, a bell in lighthouses.
 54. There can be no doubt that the gun signal would be the best.
 55. I do not know of anything better than the gong.
 59. A gong in light winds, and rockets used in night time.
 60. Gong.
 61. Either the gong or a large bell, I believe these are most effectual. A shrill whistle has been used with success.
 63. I do not know of any better than the gongs.
 64. A bell tolled at regular intervals.
 66. Gong.
 68. Those in present use.

27

Question

27

69. I consider the signals now in use in this country are quite sufficient.
70. Gongs.
71. Gong.
73. The bell and gong are better than the horn.
74. A discharge from a cannon I should think the best signal.
75. Large gongs for floating lightvessels.
76. The present system.
79. Gongs.
80. For lightvessels, a gong.
85. A gong or very large bell.
88. Gong or gun.
92. Not acquainted.
94. Bell or gong.
95. The present.
97. I know of none better than are used in the United Kingdom.
99. Gong.
100. A gun at intervals.
102. Gong.
104. At Bick Island, River St. Lawrence, I have experienced great benefit from a gun fired every half hour.
106. Gong on board lightvessel.
107. The present.
108. System used in Britain.
113. A large bell.
114. A horn sounded continually, with a gun at intervals.
116. See 9.
118. Gong or bell.
119. Cannot say.
120. Vide Question 10.
121. The gong, the bell, the signal gun, the best at present in use, but would recommend the powerful air whistle.
123. Vide Question 10.
125. A gong.
127. I do not know of any better than the gong.
128. Our system of gongs.
129. Bells and gongs.
131. The gong is best if attended to, but occasional guns would improve it.
134. The gong as used in our lightvessels I think is best where proper attention is paid in making it heard.
136. Present quite sufficient.
138. Gong.
140. Present quite sufficient.
143. Those now used.
147. A cannon.
149. Not able to answer.
150. Wind instruments are best, as the sound goes farthest, and they could be invented to be blown by another instrument containing wind, and would sound much farther than the gong.
156. Gong.
158. Gongs, and also guns at fixed intervals.
161. Guns.
162. Cannot tell.
163. The gong for lightvessels; the bell for lighthouses.
167. I have already stated the gun and bell are the best.
168. The firing of a gun or sending up rockets.
180. I think a gun fired every few minutes in fogs the best signals that can be used.
181. Answered in No. 10.
183. Firing of cannon.
186. Guns.
196. Self-acting bells.
198. Cannot be a better system than those already used.
199. Either a good bell or gong.
201. Such as used.
202. Guns and gongs.
203. The gong.
207. I think the gong preferable to a bell.
208. Cannot say.
212. Gong or gun, but the latter where a near approach is dangerous.
213. At important stations a gun every half hour, and I would suggest a modification of the steam whistle applied to a small high-pressure boiler or air vessel for use every five minutes of the interval between the guns, and also at stations of secondary importance.
215. British.
217. Gongs or guns.
218. Gongs, as all ships use bells.
220. Not acquainted.
221. A gun is fired on Bir Isle, St. Lawrence, during fog, and can form a good idea of its bearing.
224. Gongs.
226. Railway whistle, or something similar.
227. The gong or bell.
228. I am only acquainted with the gong and gun; the former is good for all general purposes, the latter for special danger.
229. The bell.
230. I have not much experience in this, but guns are used at Oporto, and I have landed Her Majesty's mails there in fogs through them.
234. The system of fog signals used in this country on board of lightships and in lighthouses I am of opinion are the best, except a uniform signal for approaching dangers. Fog signals for ships running before the wind are yet incomplete.
235. I think the gong, as at present used on board our lightships, with the addition I have named at Question 10.
236. The present.
237. Our own is good; it would be more efficient with a gun every half hour.
242. Cannot say.
244. England; the gong as now used.
247. The horn I consider the best.
249. In this country.
250. Report of cannon once every five minutes in stormy weather; a bell or gong will do in moderate weather.
251. The bells.
256. I would suggest that a gun be fired at intervals in order to distinguish them from ordinary vessels.
257. Rockets.
259. The bell.
260. A gun every half hour.
263. Bells and gongs.
264. The present is sufficient.
269. The gong for floating lights.
271. The bell.
275. Gong.
276. That in use.
279. Gongs.
280. Prefer bells for lighthouses, gongs for ships.
283. I think to fire a cannon at stated periods the best.
284. Gongs and guns.
285. The gong, as distinctive from ship bells.
287. The gong I think the best.
288. I think the use of a bell to be most applicable.
289. Our system is good, but I would suggest a strong whistle on board a lightship, and the bell in lighthouses, so a floating light could be known from a shore light Gun on Tuskar Rock fired twice in succession would be a good guide for ships to shape their course up channel in dark and foggy weather.
291. Bell signals and swivels.
292. I think a gun fired at intervals of ten minutes or a quarter of an hour the best.
293. Gongs and fog horns.
295. A gong sounded every ten minutes, then succeeded at the interval of ten minutes by the report of a cannon.
296. Gongs, bells, and fog horns.
297. A gong.
299. A gong.
301. The gong.
302. A gun or explosive instrument the best; steam whistle very good.
303. Bells.
318. The gong.
313. Gong.
315. A bell.
317. Good bells, and are used much on the coast of the United States.
311. The gun signal at intervals, as used in the Bay of Fundy, I have found of great service.
320. Ours are very good.
322. I do not think anything better than a bell.
323. None.
324. On the west coast of South America we have no fog signals, but the guns used at Sambro light, N.S., are the best I have seen.
327. The gong is a very good signal, and cannot suggest anything better.
329. I can form no opinion of their relative merits, not being foreign.
331. Bells.
335. A gun.
336. Gong and bell.
339. Whistle to steamers.
346. Gun.
348. The gongs slow but continuous, and fifteen-minute guns fired.

349. Discharge of guns (two), one half a minute after the other, then another two discharges ten minutes afterwards.
351. See Number 10.
352. Firing guns.
354. Cannot say.
355. Fog bell.
356. In this country.
358. I think if a powerful bell was used on board light-vessels, and something to make a loud report occasionally like a railway fog signal, it would be better.
361. Those in use by the north-west lightship at Liverpool, and a gong or bell at the entrance of roadsteads or harbours, same as the Copelands, entrance of Belfast Lough.
363. Nothing can be better than a bell if properly attended to.
364. A large gun fired at different spaces of time, according to the station.
365. I think the bell at the South Stack, Holyhead, a very good plan.
369. A gong.
370. Do not know.
372. Gong or horn.
373. A bell for lighthouse, a gong for lightship, and a gun for both in bad weather.
377. No information.
379. Bell.
380. Bell.
382. Bell.
383. A large gun fired every fifteen or thirty minutes at the different lighthouses.
385. The firing of guns.
386. The bell and the gong.
387. The gong I think is best.
388. Ordinance.
391. Cannon or gong.
395. Bells.
396. Gongs best for floating vessels: whistles ashore.
398. Bells and gongs.
399. Whistles ashore; bells or gongs for floating vessels.
400. I am not acquainted with any system except the gun, bell, and fog horn.
401. Bells, gongs, horns blown by machinery or screaming whistles similarly worked.
402. Lighthouses, gongs; lightships, guns.
403. A gun to be fired at regular intervals at the leading lights where the course is to be changed.
404. A gong.
405. Bells.
406. Old system.
408. Fire a cannon.
409. Bell.
410. In England.
411. Gongs and guns.
412. Dundnen paa en stor fromme eller kanan-skud.
414. Guns.
417. The same that are now in use.
420. The gun and gong.
427. The gun.
428. Guns.
429. Firing a cannon.
431. A sharp-sounding bell, and it may be rockets in addition.
433. Large bell.
434. A gong.
442. Firing guns at known intervals.
413. Our system is good, but I would suggest a whistle on board of a lightship, and the bell for a lighthouse, so a floating light could be known from a shore light in thick weather.
445. I cannot tell.
447. Gun or gong.
448. A gun to be fired at intervals in foggy weather, according to position of lighthouse or lightship.
451. British.
452. United Kingdom.
454. A clear bell.
457. Locomotive whistle or air pump.
458. Bell and horn.
460. The same as used now.
461. Gong.
462. Guns.
466. Bell.
469. Those used in England.
470. Gong.
471. Cannon.
472. The gun.
474. Gongs preferable to lighthouses and lightships, and not to be used in any other ships.
475. No experience.
476. A gong.
478. Those in use cannot be improved if attended to.
482. I think a powerful gong well beat, and no other vessel allowed to use one.
483. Guns fired at intervals I conceive to be the best, as bells or horns are not heard at any great distance.
484. A gun is preferable to all others.
485. Guns.
486. Cannot describe the system, but we do have in the United States fog signals like the whistles on locomotives, that I have heard at a great distance.
487. I know of no improvement.
489. Guns at regular intervals for lighthouses, and the Chinese gong for float lightships, with a gun when it is observed a ship approaching to danger.
490. Can recommend nothing better than a bell or gong.
492. I think good bells.
493. A large gong or bell; a gun is not heard in thick foggy weather so far as one would imagine.
494. I think the firing of guns at stated intervals, as at present adopted in the St. Lawrence, the best, in addition to the present system.
495. Great guns.
496. The system or systems in the United States is of very little use; all those things should be done by some other means than by sleepy-headed keepers.
497. A bell of sufficient calibre.
498. The firing of guns at intervals so as not to imitate signals of distress, accompanied by a powerful gong or bell.
501. I think the gong is the best for lightships; and if there are three or more lightships the outer ship should strike three,—the second, two,—and the inner, one,—every 10 minutes. By this means they would be distinguished.
504. A gun.
505. Nil.
508. As aforesaid, at No. 15.
510. Do not know the foreign system.
511. Gongs.
512. Gong.
516. I consider the gong or steam whistle the best.
517. The gong, struck by machine.
518. Gongs, if used.
519. The gong.
522. Present fog signal.
525. The present fog signals.
526. A large sonorous gong for light-ships, and no merchant vessel to be allowed to use a similar one, so as to prevent confusion; and I would suggest a whistle, acted upon by compressed air or steam, for lighthouses.
527. A gun fired, instead of the gong in use at present.
528. Guns, gongs, and bells.
529. Firing a cannon, &c.; whistle from steamers.
530. Minute guns.
531. The gong.
533. Gongs to have a sound different from ships bells.
534. A gong.
535. The gong is very powerful, and easily distinguished from other sounds.
536. The report of a powerful gun, fired at intervals during a fog; and with a little wind, some kind of aerial harp might be heard at a distance.
537. No opinion.
538. Something of a high pitch, like a steam whistle, is heard better than a gun in rough weather.
541. I am not aware.
542. I do not know anything better than a gong, and that cannot be heard far.
543. There were few such in use when I was at sea, and I am not acquainted with the matter.
544. Gong.
545. The one in present use.
546. I have mentioned, in Questions 10 and 11.
551. Gun.
552. Not acquainted.
554. Firing off guns, and a gong.
556. Gong.
557. I consider a gun, fired frequently during a fog, to be the best signal.
559. English.
561. Would suggest a large bell.
564. A gun to be fired every quarter of an hour from lighthouses on headlands, and a carronade from lightships in dark and thick foggy weather.

565. I think blue lights and rockets, and gongs, are the best fog signals in hazy weather for lightships and lighthouses, in all countries.
567. Gongs.
569. Gongs.
571. The system in use in Britain, viz., the ringing of a bell, or firing of a gun at intervals.
573. I consider the fog signals in the United Kingdom quite efficient. I have not had the means of ascertaining others.
575. In lighthouses, during fogs, one gun should be fired every half-hour; and on board of lightvessels, two guns every quarter of an hour, in succession. Gongs are of no use in bad weather.
576. A gun on all islands where a lighthouse is, and a good bell, or gong, in all floating lights.
577. As at present used.
578. Cannons and gongs.
579. See answer to Question 10.
580. The gong.
589. Guns, as at Sambro, in Nova Scotia.
591. The gong, worked by machinery.
593. A great gun, fired at intervals, and a long fog horn, with a reed in it. If one gun were placed near Kinnaird Head, and a fog horn for the herring-fishing season, and used when a fog was, it would be a great advantage and safety.
597. Bells.
598. I think there can be nothing better than the gong and bell.
599. Large bells and guns.
605. Have no experience on the point.
606. The present.
607. Guns every 15 minutes; gong and bell in the intervals.
608. Bells frequently; guns at intervals.
609. Good gongs and bells are sufficient.
610. A gun every quarter of an hour, gongs and bells.
611. Gongs and bells at very short intervals, guns every 15 minutes, at the principal lightships.
612. Bell and gong, with guns occasionally.
613. I think a gong the best. I prefer our own system.
614. Guns.
615. Guns.
616. Guns are best.
618. Guns.
621. I am not aware.
622. A good bell is useful, but where a gun can be used it is much better.
625. Large bell, worked by machinery; but whatever fog signal is used at a lighthouse or lightvessel, should not be used on board ship.
628. Gong.
629. The gong for lightvessels. In this, or any other, as I have never heard any signals from foreign lightvessels.
630. The gong.
632. The most loud.
633. The gong.
640. Good gongs and bells frequently used, and guns every quarter of an hour.
642. A large bell, or a gun occasionally, in the vicinity of any dangerous sand.
644. The bell.
647. Deep sounding bell or gong.
649. That in Newfoundland—a gun fired at regular intervals.
651. I would recommend the most brilliant and space-penetrating light, and use loud and sonorous gongs, struck rather quickly, but uniformly, in fogs. I am not aware of such practice in foreign countries.
654. I have never considered, and am not much acquainted with them.
657. I believe our own fog signals (gongs, horns, &c.) to be the best.
658. Ringing a bell.
660. Guns, fog horns, and Chinese gongs.
666. I know of none better than those used in the Channel.
667. Guns fired at the same interval as the lights take in revolving, and a uniform time for all fixed lights.
668. The gong.
671. I am not aware of any better system of fog signals, to foreign lighthouses and lights, than on the English coast.
672. Gongs in preference to bells.
673. Chinese gongs in preference to bells.
674. I do not know of anything better than gongs.
675. Cannot say.
676. The gong.
679. Steam whistle.
681. St. Bee's Head light is situated on very high ground, and when the fog hangs on the land it is hardly perceptible. A gun would be a great addition, say, every quarter or half an hour.
685. I find, from experience, that on the present system I could suggest nothing better.
687. The present system.
688. Bell constantly rung, and gun fired at intervals.
690. Gong.
691. At Boston outer lighthouse, off Sandy Hook, United States, there are bells, which are worked by clockwork, said to be good, but I never heard them.
692. The gong.
693. No experience about it.
696. The gong, as at St. John's, Newfoundland.
697. Guns and gongs, bells, &c.
699. The bell and gong are the best.
704. The gong, worked by machinery.
705. Gongs, as at present.
707. No experience.
708. Gongs. Floating lights. A large bell, in a lighthouse.
709. Those in use now I consider the best.
712. Fog gun.
713. Gun, to be fired every 15 minutes continually, in foggy weather.
715. I consider the gun best.
716. Gun I consider the best.
717. Fog bells and fog horns are good, and fog gun in certain important position.
718. Fog guns.
719. A gun for lighthouses, and bell for lightships.
720. Guns in some instances, and bells in others.
722. Guns.
723. Fog bell, fog horn, are good, and fog gun in certain important positions.
724. I would recommend a fog gun on the Kish floating lightship at entrance of Dublin Bay; also on the north-west lightship, entrance to Liverpool, so much frequented.
728. Gong and horn; a powerful deep-toned bell best.
729. Guns.
730. I think the gun for lighthouses, and the gong for floating lights, are the best; but they should be used at stated times, and varied,—say, 1 gun every 10 minutes, at the Lizard; 2 guns every quarter of an hour, at the Start; 3 guns every 20 minutes, at Portland. Then commence again with 1 gun at St. Catherine's harbour lights; and others out of the track, 1 gun.
731. Gong and bell.
737. Guns, periodically; bells, frequently. I think little of the gong.
738. I think nothing better than the gun and gong, if used regularly, and at short intervals.
741. As I said before, a gun at certain stations.
747. I think a bell struck with a hammer, worked by machinery.
750. Guns; the intervals to be stated in the Admiralty list of lighthouses.
751. A gun every ten minutes or quarter of an hour.
753. Guns.
754. Know of no better system than is used in Great Britain.
755. Large bell and gun.
756. As good as any.
758. I have not had any experience of the foreign system.
759. I am of opinion, in addition to a good bell or gong, a gun should be fired at intervals of half an hour, at entrances of channels or harbours.
761. Instead of the regular tolling, I believe that if intermittent (three times, three strokes), quickly following a pause, as in what has been called "Kentish fire," it could not be mistaken for imagined town or other bell sounds; besides, on acoustic principles, as exemplified by the gong, the waves of sound would be more powerful and much further extended. I conceive that machinery to effect such change could easily be obtained.
762. Gongs, of large size, and good sonorous metal.
765. Large bells, frequently used, guns at longer intervals.
772. A gong; and by night frequent powerful blue lights, similar to those used off the Sandheads of Calcutta.
773. Never recollect any foreign nation troubling themselves to make signals during fog. (See Answer to No. 10.)
774. A gun at stated periods.
777. I cannot say which are best.
778. Gong.
783. Bells frequently; guns every quarter of an hour. I would here suggest that a rocket be used, instead of

- a blue light, on board the North-west lightship, as it might sometimes be seen above the fog.
784. An occasional gun, an occasional powerful flash light, and a powerful gong struck with regularity.
789. See No. 11.
791. Gun and bell.
792. Gun and bell.
793. Gun on leading lightships, bell on lighthouses.
28. If you think that any uniform system of Buoyage applied to Coasts, Harbours, Channels, &c. would facilitate navigation, give your opinion, and describe the system.
3. I do not; the channels are well buoyed generally.
5. I do not think any system of buoying would facilitate the navigation better than that at present used on the east coast of England.
6. No.
7. I have sketched the system under No. 16. All that is required is simplicity and distinctness.
8. See No. 16.
9. To have one side of the channel red or black buoys, and the other side white or chequered buoys.
10. I think there should be a uniform system of placing buoys, that is to say, so that all of a colour should be passed on the same side.
11. In narrow and tortuous channels, buoys or stakes on one side red, and on the other black.
12. A general system should be adopted for all ports; for example, light-coloured buoys, white or yellow, on starboard hand going in; dark-coloured buoys, black or red, on port hand going in; reverse in coming out; chequered buoys to mark shoals in mid-channel; green buoys, wrecks.
13. I think it desirable to adopt, as far as possible, an uniform system, and that proposed by Mr. Cunningham, Secretary of Northern Lighthouses, seems to be generally well adapted to the purpose. There may be cases of narrow and tortuous channels, where, from the buoys appearing to overlap each other, the red and black may not be sufficiently distinctive at dusk; but in most cases a bright red, combined with difference of shape, (a feature not noticed in the above system,) would suffice.
14. I think the present uniform system very good.
17. In my opinion, the present system is quite sufficient.
18. All, and in all channels should be alike, red on one side, and black on the other.
20. None.—21. None.—23. None.—25. None.
26. I think that monster buoys moored at the entrance of channels to be the best, or on the end of dangerous sands.
27. None.—28. None.—29. None.—30. None.
31. I know of none better than the present in use.
33. I do not.
35. Uniformity very desirable, and different-shaped buoys to mark the side of channel.
36. I have stated my reasons respecting buoyage in Answer 23.
38. None.
39. The buoys on one side should differ in shape and colour to that on the other.
40. Large nun buoys.
41. I think the last improvement of black buoys on the port side, and red on the starboard, is the best system.
42. I think our present system is good.
45. I think all buoys, beacons, and lightships should be black as much as possible, or, if not black, red is the next best.
59. I cannot say.
60. None.
61. I have not thought on this subject, but believe our present system good, especially if dark-coloured buoys be used.
62. I think the system now adopted in Scotland, viz., in entering a river or port, black on port, and red on starboard hand, with a distinguishing fairway buoy, would facilitate navigation.
66. Large nun buoys.
70. Large nun buoys.
71. None.
73. No. we should not know the difference. There must be no alteration. The present system is the best.
76. I would suggest no alteration in the present system of buoyage.
78. I consider that buoys of a particular colour (say, black, for instance,) should, as far as practicable, be placed on the same side of all channels. Under the present system the buoys are so placed that a man in passing through one channel will have all the black buoys on his starboard hand, and in the next he may have them all on his port hand. This is the case inside the Isle of Wight, and is apt to confuse a stranger.
85. The usual system, red one side, and black the other.
87. Do not know of any.
89. Generally, to apply the red colour to the port side of entrances of harbours and sounds would probably be of service.
90. Do not know of any.
91. I consider a system of uniformity necessary to facilitate navigation in respect to buoys, beacons, and lighthouses, where practicable, both in colour, shape, and light. Such a system, in regard to buoys, is described in the printed report of the Secretary to the Board of Northern Lights. But in order still more fully to carry out the system, it might be desirable to substitute dark green for the proposed black, which would assimilate with the green lights marking channels by night.
94. I think all channels and harbours should have a uniform system. By placing a can buoy on one side the channel, and a barrel buoy on the other side, and all cases should be uniform, having a particular-shaped buoy on north or south side.
97. All the channels I am acquainted with are well buoyed.
100. No.—112. No.
114. I can think of none better than the present system.
116. In all channels there should be on the port or larboard side, black buoys going in for the river or harbours; left or the larboard hand.
119. Cannot say.
120. On the entrance to the port there is a shoal called the Tinker, with two white buoys on each end, and in thick weather it is difficult to distinguish the east buoy from the west buoy; I would suggest a black ring being put round one buoy, so that the east buoy should be distinguished from the west buoy. There are also two red buoys in the western channel of this port on the shoals Queen and Scotch ground; I would suggest a white ring being placed around one, so that one should be distinguished from the other in thick weather.
123. On the entrance to the port there is a shoal called the Tinker, with two white buoys on each end, and in thick weather it is difficult to distinguish the east buoy from the west buoy; I would, therefore, suggest a black ring being put round one buoy, so that the east buoy should be distinguished from the west buoy. There are also two red buoys in the western channel of this port on the shoals Queen and Scotch ground; I would suggest a white ring being placed around one, so that one buoy should be distinguishable from the other in thick weather.
128. I know of none better than the present system.
129. No.
132. I think buoys should be of an uniform shape and colour for each side of the channel, black nun buoys on one side, and red buoys of another shape on the other.
133. All black buoys should be left on the starboard side entering harbours, and the land side elsewhere.
134. I cannot think that any alteration from the present system will improve the navigation thereof.
136. Blue lights by night and black balls by day.
140. None.
144. The system now coming into use of having red buoys on the left and chequered on the right is good as far as harbours are concerned, but liable to be mistaken in channels.
149. No opinion.
150. I believe a uniform system would be far best, and would facilitate navigation, and often be the saving of life and property, when pilots cannot be obtained—but space too short to define.
161. White on one side of the channel and black on the other.
162. Cannot tell.

28

Question

28

163. Do away with the small can buoys and have nun buoys.
167. Nil.
174. I am of opinion that uniformity is calculated to confer the greatest advantage on navigation.
178. If all buoys in all channels were to be alike, say all red conical buoys be left to port, chequered barrel do. to starboard; buoys that may be passed on either side to have a beacon on it, strangers would know in thick weather their position in making a port.
180. I cannot at present think of any.
181. I cannot answer.
195. I think that a universal system of buoys might be adopted with advantage; thus having all the buoys of one colour to be passed on the starboard hand, and vice versa, of an opposite colour; middle grounds, chequered or striped; and this should apply to every channel, that a ship suddenly falling upon it might know on which side to pass in safety if they could identify the buoy.
196. Red can buoys on the starboard, and black nuns on the portside, going into any harbour, with the name of channel and number of the buoy.
198. None.
202. Answered at Question 16.
203. No.
204. I would suggest, that all the buoys of the United Kingdom on the starboard side should be black.
213. The system of buoyage in practice at Liverpool is excellent.
222. I consider it would be of advantage if all buoys were of the same colour on the same side in entering all harbours. For instance, Lynn, white buoys starboard side; other ports on Norfolk coast that use white buoys, place them port side in entering. Boston, port, red; Wisbeach, starboard, red, in entering.
224. The Norman's Land buoy would be better red or black, with a beacon placed on it.
228. The only suggestion I can make is, that black buoys should be placed on starboard hand, and coloured on the larboard, with large nun buoys for fairways (black).
229. Yes; but I consider it difficult to decide which would be the best.
232. I should think the system of buoying the channels and rivers should be white on the starboard, and black on the port hand, on the British coast.
233. All white on the port side, all black on the starboard, and red for fairway, would be a great relief to the channel in taking harbours in a gale of wind when pilots cannot be had.
234. I think the present system sufficient for entering channels or rivers; starboard hand black, and port hand white or red, and fairway buoys before mentioned should be distinguished by a bell or something similar to that.
237. A general system should be adopted throughout England, Ireland, and Scotland to have red buoys on one side, and white on the other. A stranger could take safely any harbour then.
242. Cannot give an opinion.
244. The present system requires no alteration.
247. I cannot.
250. In harbours or channels, going in, nun buoys, black, starboard side; can buoys, red and white, port side.
251. On the coasts the system would seem dangerous, owing to the liability of breaking loose; but in those channels where practicable, to a standing, it would in a great degree assist navigation.
255. Black and white in channels, chequered on banks or flats.
256. I do not think it would.
263. The buoyage is good.
275. On entering the harbour, red to port; green buoy, with beacon, to starboard.
276. Black seen best at night.
278. Red on port hand going in port in all channels would facilitate navigation.
279. Cannot propose any better plan than that adopted.
282. Buoys of same colour to be left on same hand in all harbours, channels, &c.
283. I think if there was a law to have the buoys throughout the kingdom determined as to colour on each side of any channel, it would tend to prevent mistakes.
285. I think uniformity might be adopted; say, pass to the north of black, south of white, to east of circular, and to west of striped partly coloured buoys, or otherwise, so as to make the arrangement general throughout the United Kingdom, if not in Europe.

287. Red should be used on the starboard hand in entering all harbours, and black on the port, with chequered buoys on shoals.
288. I am not aware.
292. I think the present system quite sufficient for all purposes.
299. Black on the starboard side in entering harbours, rivers, and swathways, and red on port side, white on middle patches, and chequered on turning points, with staff on Neilson buoy.
302. Yes; to adopt the uniform rule in entering any channel or river to place black on the starboard, white on the port.
303. Nothing to particularize under this head.
315. I have no opinion.
320. I would suggest that all buoys should be uniform with the ships' lights of the present day in buoying the various harbours and channels, namely, all green on the starboard hand, and all red on the port.
323. No.
324. I cannot say.
329. Nothing preferable to the present system has occurred to me.
330. On entering harbours, red buoys on the starboard going in, and black on the port.
333. Uniform would certainly be best, both in colour and form.
336. Buoys on the one side and beacons on the other, particularly in crooked channels; striped or chequered buoys on the middle banks.
348. A uniform system would certainly facilitate navigation to seamen, briefly described at 21.
349. No.
355. Can suggest nothing better than now used.
356. No.
361. I know of none better than is in use.
363. Cannot suggest any improvement.
364. A general system; black buoys starboard and white buoys port side going into harbours, and to the eastward or northward through channels, with chequered black and white when can pass either side; every buoy marked and numbered.
366. I have described in Question No. 16.
370. I think we are very well off.
372. I would have all buoys of one colour on one side; where the channel takes another direction I would place a large nun buoy with staff and bell.
373. I like black, and striped or chequered black and white to define a channel; a red, fairway; and green, wreck.
377. I am of opinion the better a coast or harbour is buoyed, the greater facility in navigating and with safety.
379. Beacon buoys are seen at the greatest distance.
380. Beacon buoys.
382. Beacon buoys are seen furthest off.
385. In rivers all the buoys on one side to be of the same colour, say black, one side, and red on the other; but in channels that have to be entered from sea, the buoys should be varied somewhat in colour.
386. I could not hazard an opinion.
388. One side of the channel, one buoys, the other side, can buoys; the can buoys black, the one buoys red.
390. I think it would be a great advantage to navigation to have an uniform system of buoyage, let one colour always point out the right side of the channel, and another the left, say black and red, fairway buoys chequered black and white.
394. To always have red buoys on the starboard hand going into any harbour; if required to distinguish another channel, let it be by the buoys on the port hand.
395. I do not know of any improvement.
398. Can give no opinion.
399. I know nothing better than the present, cannot suggest any improvement.
401. No; different coasts require different systems; buoyage suitable for one place might not answer in another.
402. None.—406. No.—410. No.
414. I think all starboard and port buoys in the channels ought to be uniform.
419. I think if all channels, &c. were to be buoyed alike, say, for instance, all buoys to be left to port to be red conical; buoys to starboard, chequered barrel do; fairways, on rocks, &c. to have a beacon buoy; in bad weather a stranger would be much assisted.
420. No.
445. I do not know.
451. No.—461. No.

462. Consider that the present system of buoyage quite efficient.
472. No.
474. I cannot describe any other system better than that at present in use.
475. Most decidedly; see answer to Question 16.
482. In my opinion the present system is very good.
483. I can imagine none better than those generally in use, viz., red and black buoys on different sides of a channel, with chequered to point out dangers in mid-channel.
486. Never thought much on the subject.
487. I do not.
493. In the proper channel for strangers, white on the port hand, black on starboard hand, going in.
494. I do not know of any.
495. A line of buoys from the Kish lightship to the Arklow lightship along the outer edge of the banks would be of unspeakable value, different colours for the different banks; the same could be done outside of the Aves, English Channel, Sovereign Rock, &c. A few buoys could be placed across the mouths of deep and dangerous lays.
496. The system universal in the United States of all buoys on the starboard hand one colour, all on the port hand another colour, and channel buoys another, and obstruction buoys another, is a very excellent system.
499. Have not had an opinion.
501. I think all channels after passing fairway buoys should be painted red on starboard, and white on port hand, going in, and chequered on banks or patches near the fairway.
505. Nil.
510. Consider that the system of placing light and chequered buoys on the larboard hand, and black and dark buoys on the starboard hand, is the best.
512. A uniform system would facilitate navigation for harbours and narrow channels, say white on one side and black on the other.
518. Cannot say.
519. Can speak of none.
521. I have described in No. 17 (former sheet) relative to buoys.
527. I think the present system quite sufficient.
530. I am not aware of any better system.
531. The buoys to be of a different colour on each side of any channel.
533. Tidal harbours to have a red light at tide time, and bright light at other times.
536. Not aware of any system.
537. I think a uniform system very desirable for all harbours, it would frequently save from shipwreck in strange harbours and channels; I would buoy on the same principle, all same as entrance to harbours.
538. A uniformity of system is much needed. In United States of America and in Canada,—entering harbours, red buoys and even numbers should be all on the right; black buoys with odd numbers on the left or port hand; channel buoys, black and white perpendicular, may be passed on either hand; and black and red horizontal are on obstructions, and may be left on hand in passing.
541. I am of opinion the better a coast or harbour is buoyed, the greater facility and safety in navigating.
546. I have mentioned in Question 16.
549. No.
551. Black and red for left and right banks of rivers, and chequered black and white and red and white for centre shoals.
552. Can give no opinion.
558. There should be one system, say, white buoys port side; black, starboard; for channels—parallel black and white chequered, port; red, starboard; for the eastern or southern channel, a racket buoy for port entrance of a channel, and inverted cone, starboard; and the east, nun buoys with or without beacons for outlying shoals.
559. Buoys mentioned at Number 15.
560. If red buoys were universally adopted for the port, and black for the starboard hand, on entering a river or channel, I think it would facilitate navigation.
561. The system that is at present employed in the rivers Mersey and Clyde—for entering the channel, red on starboard; black, port hand.
565. I think that two sorts of coloured buoys would be a great improvement for all harbours and ports and bays, that is to say, all black on the starboard hand, and all white on the port hand, going into harbours, ports, or buoys; for if a stranger is about to run for a port in a gale of wind, and not able to get a pilot would at once know, when falling in with the buoys, which side to leave them on, and be able to find his way into port, and save both ship and passengers' lives. The Elbe and the Weser and Eyder is so, black on the starboard hand and white on the port hand. I have many times been obliged to take the Elbe and Weser in a gale at north-west, and no pilot to be got, and, by the channel being buoyed as above, I was able to find the way in in safety, and thus save ship and passengers' lives, for it would be impossible to keep a ship off in long winter nights, and to anchor would be of no avail; therefore I think black and white buoys would be a great improvement in all channels, the black on the starboard hand and the white on the port hand going into harbour.
569. Do not know any.
571. I consider the system of buoyage used in Britain superior to any other known to me, and, as the channels are more intricate than those leading to ports in foreign countries, uniformity in colour would not facilitate navigation any more.
589. The dangerous parts of the Channel lighted and buoyed sufficiently.
591. I have no opinion to offer.
593. I cannot give any other than that which is now generally adopted.
597. I think the present system is good.
598. Not aware of any.
604. Present system best.
605. Have no experience on the point.
606. I think buoys painted black are the best when kept in good order.
607. A uniform system is undoubtedly the best. That in use about these coasts is black on one hand, red on the other, chequered on detached rocks or patches, perch buoys at the elbows.
608. A uniform system should be employed all round the coast, viz., black on port hand going in; red on starboard; chequered on detached rocks or banks; perch and ball on the elbows.
609. I think there should be a uniform system, as used in the Mersey, Dee, and Menai Straits, viz., black nun buoys on port hand going in, red can buoys on starboard hand, perch buoys where to alter course, chequered buoys on detached shoals.
610. I think that the uniform system used in Beaumaris, Chester, and Mersey rivers should be used round the coast of the United Kingdom.
611. I think that the system applied to the Mersey should be brought into general use, viz., red on starboard hand going in, black on port hand, chequered on detached patches, perch and ball on elbows.
612. The system of buoyage adopted in the Mersey should be brought into general use in my opinion.
613. I think channels might be buoyed with one colour for port, and another for starboard hand; particular buoys might be nun buoys, or marked with staff and ball, cross, or diamond, as at the back of the Goodwin.
614. The system applied to the Mersey should be generally adopted.
615. The system adopted in the Mersey I think the best, viz., all black nun buoys to be left on port hand going in; red can buoys on starboard hand; elbow buoys with perch and ball; chequered buoys to be left on either hand.
616. I think a uniform system should be applied to the coasts of Great Britain, and greatly facilitate navigation. The system adopted in the Mersey is the best I know of.
618. No system can be better than that applied to the Mersey, Dee, and Beaumaris Strait, viz., black buoys on one side of a channel and red buoys on the other, perch buoys on projecting spits, and chequered buoys on shoal patches.
621. I am not aware.
622. Buoys generally are too small, they have been enlarged in the Queen's Channel at the entrance of the Mersey,—I find them of great advantage.
624. The round buoys on the starboard hand and conical upon the port would be simple and useful if general.
627. Decidedly, it would be a great boon to strangers if one uniform system were introduced and enforced.
636. Black spiral buoys on the starboard and red can buoys on the port hand entering all harbours, channels, etc., with white or chequered buoys on shoals in the fairway, green for wreck as usual.

640. I think a uniform system would greatly facilitate navigation, as, for instance, black buoys on one hand and red on the other, &c., as used in the Mersey.
642. Consider a uniform system of buoyage should be applied to all coasts, harbours, &c., viz., black on one hand and white on the other.
644. The present system I consider good.
645. The simple system of white buoys on the starboard and black buoys on the port hand on entering any intricate channel would facilitate navigation.
649. One colour to port, another to starboard, and one particular shape for fairway buoys.
650. Conical and can buoys, black or white.
651. Our system of placing green buoys on wrecks, beacon buoys on corner shoals (turns in channels), and buoys painted of different colours, or chequered, numbered, or lettered, answers pretty well.
652. An uniform system throughout the world most important, for instance, all black buoys to be left on the starboard hand going in, all red on port hand, white fairway buoys (to be steered for).
653. Where practicable at the entrance of harbours and narrow channels, I am of opinion that the uniform system of red buoys on the starboard hand and black buoys on port entering, would facilitate the navigation.
654. Any lights or buoys to mark the fairway would be of great service, but I have never given it a consideration before now; one would like many good things, particularly if they knew they could get them.
657. I think a uniform system of buoying channels would much simplify the navigation; say, black buoys on one side and white on the other, and a chequered buoy where a vessel can pass on either side of a shoal.
660. Same colour on same side of the channel.
666. I think our present system very good.
667. I rather think by having all harbours buoyed with similar coloured buoys on the starboard and port sides might prevent ships getting into difficulties and facilitate navigation.
671. I think where buoys are requisite on both sides of a channel, I would have red conical buoys on one side and black barrel-shaped buoys on the other.
672. In a channel, as described in Question 21.
673. In a channel, as described in Question 21.
674. No.
675. The present system is good.
676. I am of opinion that if the system of having all buoys black on one side of a channel or harbour, and red on the other, were adapted, it would facilitate the navigation.
677. I think that Carnarvon Bar should be buoyed on both sides of the channel, red on the starboard and black on the port side.
679. On approaching an anchorage or harbour, the buoys which are to be passed on the port hand should be white, and the starboard hand black; a red buoy or striped black and white fairway buoy.
680. An uniform system is desirable if practicable.
687. Harbours and channels may be marked with buoys on one side of one colour and the opposite of another.
688. I do not think any system better than the one in use.
691. I consider the system at Liverpool good, cannot think of any better, nor do I know of one.
692. Black and white most readily distinguishable.
693. I think it would be better if all channels had red buoys on one side and black on the other, beacons at particular points.
694. A uniform system would be of great advantage if practicable, such as having the red buoys always placed on the port hand, and black or white buoys on the starboard in going into harbours, and green buoys on very shoal patches.
695. I think one uniform coloured buoy should mark one side of a channel, say, red, and black the other, as white is difficult to see in a glare; and I think that system should be carried out all over the world if possible.
696. See answer to No. 16.
697. Cannot say.
699. I would recommend the buoys on either side of a channel to be one colour.
704. I think one uniform system of having all buoys on one side of a channel black, and on the other red or white, and numbered as necessary, would be an improvement.
705. Leading up to a port or river, all buoys in a channel of one colour (say black) on port hand, red on starboard

- hand. All buoys at the entrances of channels or ends of detached sands to have balls or other distinguishing marks on top.
707. For all harbours and channels, on entering, black starboard, and white on port side.
708. At night-time or hazy weather we often can see a buoy, but cannot make out the colour. If the buoys were all one shape on one side, we then should know what side of the channel we were on. Spiral or nun buoys one side, can or flat-top buoys on the opposite side.
709. I consider the present very good.
712. Would recommend uniformity of buoyage and colour to be made general.
715. I think there should be a uniform system of buoying throughout the United Kingdom, such as the black nun buoy on the port hand going in, and red can on the starboard hand, similar to the buoying of Liverpool and Dublin.
717. The system in Liverpool is very good.
718. I have formed no opinion.
720. Large buoys, red and black.
721. Nothing more than at present used.
723. The system in Liverpool is very good.
726. Any uniform system of buoyage would be of great service. Ex. gratia: If on entering a port all black buoys were to be left on the port, and all white buoys on the starboard side; if a particular shaped buoy indicated a continuous shoal, extending from the mainland, and a different shape an insulated danger, &c. &c.
728. All buoys should have beacons on them, with balls at the top distinguished by their different colours.
730. I think there might be a more uniform system of buoyage, such as buoys of the same shapes and colours on the same side of all harbours and some particular channels, and ball buoys on the ends of shoals.
733. An uniform system of buoyage would be serviceable, such as buoys of a certain shape and colour, &c. placed upon predetermined magnetic positions.
737. I am decidedly of opinion that a uniform system should be adopted in all the harbours and coasts of the United Kingdom. I would recommend the system adopted in the Mersey.
738. I know nothing better than placing buoys all of one colour on one side, and all of one colour on the other.
741. No.
747. I think if buoys and beacons that were to be left on the starboard hand were all black, and those to be left on the port side were all red, or black beacon buoys, as black is the best colour at night, it would facilitate navigation.
750. The size of the buoys to be increased, and a general rule as to the colours of the buoys on the port and starboard hand.
753. Red buoys on the port side, and black buoys on the starboard side of every channel going out; this would secure uniformity, with chequered buoys to mark the fairway or shoals in mid-channel; green buoys, as now, to denote wrecks.
754. Know of none better than the present.
755. Buoy on both sides of the channel, black and white.
756. I know of none.
758. In marking the boundaries of a channel, steering in, white, starboard; black, port; chequered or striped, mid-channel; and a bell or beacon buoy at the sea extremity of a shoal.
759. In entering ports or harbours, all red buoys on the port hand, and black on starboard.
762. Not competent to judge.
763. In all British ports the respective colours should universally be used for the same purpose, and to mark the same side of any channel.
765. I decidedly think that the system adopted for the Mersey should be brought into universal use.
772. Buoyage depends entirely on the locality of the place. I do not think a uniform system would answer in all places alike.
773. See Answer to Question 21.
775. I think that a uniform system of buoyage would facilitate navigation; but the only approach to that that I have experienced is the change that of late has been made in the River Tay. I think it is a good change, and should be applied to all rivers.
777. I have always had most confidence in entering a channel or harbour when the buoys were all black on the one side of the channel, and all red on the other.
782. Buoys of same colour to be left on same hand.

28, 29

Question

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783. I think a uniform system should be applied to all places. In my opinion, the system adopted in the Mersey should be brought into general use.
786. I would suggest in all fairways the buoys would be best coloured red on the starboard side going in, and black on the port side.
789. Starboard hand of all harbours, &c. &c. ; buoys black, red, chequered, or striped. Port hand, white; chequered red or black, or striped.
29. What system or description of Tide Signals applicable to Lighthouses and Floating Lights do you think best, and if you are able, give the code for day and night.
3. The day tide signals at this port are very distinguishable; a ball under a red flag while the water is under a certain draught, the flag alone between other draughts, and a ball over the flag when the water has risen to a particular height. I know of no better signal by night than the usual red tidal light.
5. I think no system can be better than at present, either by night or day.
6. Red lights by night, and red flags or black balls by day.
7. Lighted at a tidal period at night, and actual figures for depths by day, as mentioned in No. 12.
9. Tidal shades to be attached by machinery to a self-registering tide gauge, so as to denote by figures every foot, rise or fall, of the tide, thereby showing the exact depth at the entrance of the harbour.
10. A black ball by day, and a red light by night.
13. A system that would show the depth on the bar, dock sill, or entrance to a harbour, is essentially necessary; but I have not formed an opinion on any particular mode that has been adopted or recommended.
14. I have not studied the subject.
17. The present very good.
18. Cannot say.
20. Red lights at flood, and green at night at ebb tide, and flags by day.
22. Red light by night, a blue flag by day.
23. Red light by night, flag by day.
25. Red light by night, flag by day.
27. Red light by night, flag by day.
28. Red light by night, red flag by day.
29. Red light by night, red flag by day.
30. Red light by night, red flag by day.
31. The present very good indeed.
42. I think our present tide signals are good.
49. None.
55. I can give no opinion.
59. I cannot say.
60. Red light by night, red flag by day.
61. I do not think anything can be better than ours is, a light at night time, or a flag in the day, taking care to keep these different to the other lights.
71. Red light by night, red flag by day.
73. I know of no better than the present, the flag and the signal ball.
76. Cannot say.
87. Cannot say.
88. Red, safety; green, dangerous.
90. Cannot say.
91. I recommend the system as described in the above report, with the addition of lower depths being indicated for shallower harbours.
94. For a lighthouse, a ball during day, a tidal light at night; a lightship, a flag during day, a tidal light at night.
97. I think the tide signals for Dover Harbour very good; viz., by day, a ball under a red flag, from 7 to 10 feet, from 10 to 13 feet the red flag only; from 13 feet and upwards, a ball over a red flag. By night, 1 red light from 7 to 10 feet, 2 red lights from 10 feet and upwards.
100. Cannot say.
107. No.
113. The kind of tide light will depend much on the kind of stationary light at the same port; I think a red ball by day is good.
114. I cannot describe any better than those in use.
119. Cannot say.
120. I am not.
121. I think the air whistle might be made use of when vessels were passing near the lighthouse or lightship, either by night or by day.
123. I am not.—125. No.
128. The present very good.
129. No remarks.
134. The present system I consider is best, and with a proper attention to them, cannot be mistaken.
136. None.
140. Blue lights by night, and black ball by day.
149. Not acquainted with tide signals.
150. Flags are an evil when most required, as with the wind blowing on the shore, or in other words, in port, the flags are not discernible, being end on; but a large black flat-sided beacon, perforated with large holes, would always be discernible seaward.
161. A ball by day, and a light by night.
162. Cannot tell.
167. A flash signal every five minutes.
180. I have never taken the subject into consideration, therefore I am not prepared to answer this question.
181. Same as now in use.
198. None.—201. No.
202. Balls by day, and lights by night.
213. The system of tide signals in use at the Rock lighthouse, Liverpool, is found to answer well.
228. I am acquainted with no code. A staff divided into 6 spaces, black and white, or coloured, the particular space would denote the hour of the tide; blue, red, and bright lights would denote the hour of tide likewise.
229. I cannot satisfactorily reply to this question.
234. I have not given this sufficient consideration, but whatever code be adopted, it should represent "the depth of water on the bar," and the supposed sea or sand on do., and not to approach except in extreme cases of emergency.
236. Ball signal by day, red light by night.
237. I cannot offer an opinion; I am afraid we have too many lights and bad looks out.
242. Cannot say.
244. Dover and Ramsgate are good, and well known by day and night; should suggest the same for other harbours.
247. A second light.
250. To show one bright light and another red when there is ten feet water in the night; a flag in the day when there is 10 feet water.
251. Having not seen any, cannot form an opinion.
255. Red.
256. For lighthouses, a red flag by day, and if the lighthouse shows a bright light, a red light below it by night, or vice versa; and for lightship a green light instead of red, and flag by day, as above.
263. Blue flag by day, a flash light by night, to commence the tide at tidal harbours.
264. Blue lights by night, black balls by day.
271. The same as Dublin and Carlingford Lough.
276. Not able.
279. Balls and flags by day.
282. Balls by day, light by night. The height of the tide is too often a matter of loose calculation. In most lighthouses a little simple machinery might be constructed to show the light-keeper the true state of the tide.
283. I think the system of balls by day and lights by night are as good as can be adopted.
284. Balls and lights.
288. I should think a black ball on an elevated position in the day, and a bright light by night similarly elevated.
291. Every commander navigating a vessel can readily ascertain the state of the tides without signals.
292. The present system answers very well, that is, a red flag or ball through the day, and a red light at night.
302. One colour for flood, and another for ebb.
303. A bright light at night, and a ball during day-light, to be displayed so long as there is a given depth of water in the harbour.
315. I am not able.
324. I have no practice or experience of tidal lights.
329. I cannot offer anything that would be an improvement on the present practice.
336. Flag by day, red light by night.
348. Let even numbers be represented on the port, such as the signals adopted, and odd numbers to starboard of light, or the lighthouses for tide signals; by day it would suit for lightships.
349. Not capable of answering.

356. Marryatt's code for day, and code of night lights.
 361. There can be no better than the one at the entrance of Dublin, and also at Whitehaven.
 363. Cannot suggest any improvement.
 370. No.
 377. Distinguishing lights by night, signal balls by day.
 386. I would rather decline giving my opinion.
 387. I think the enclosed an efficient code.
 388. Not able to answer this question.
 390. Flags by day, commencing at, say, 9 feet, half masts when there is half foot more; all ports should have uniform signals; coloured lights may be used at night, and obscured for one, two, three, or four minutes, as the water increases one, two, three, or four feet.
 394. By red lights at night, and flags in the day.
 395. The present system.
 398. Thinks that the present system is good.
 400. I do not think tide signals at all necessary; shipmasters can always ascertain the state and rate of tides.
 401. I think that tide signals should be separated from the lighthouses and vessels, as they may cause neglect of the light, or a mistake as to its identity.
 402. No opinion.
 406. I could not say.
 410. No.
 418. Flag in the day, and a light at night.
 420. No.
 433. The present system of the rock light, of a ball in the day and a light in particular position during the night.
 445. I do not know.
 447. Balls or flags during day, and lights at night.
 448. An extra light in lower basement by night, and a ball or flag by day, as circumstances may admit.
 452. The system in use.
 457. Lights at night, and the present code at day.
 462. Black balls by day, and lights by night.
 469. White, and ball by day.
 474. That for lighthouses ball hoisted by day, and small second light by night; at present I do not know of any for lightvessels.
 475. Not sufficiently well informed to answer.
 482. I must decline giving opinion on the question, pilots and others resident about such localities being more competent than myself.
 483. I have not studied the subject.
 486. Cannot do it.
 487. I know of no improvement.
 494. I am not able to suggest any improvement on the present system.
 501. I would approve of Liverpool Dock light system for day and night.
 505. Nil.
 510. Cannot say.
 511. A flag or ball by day, and coloured light by night.
 517. Tide light; ball by day, gun in fog.
 518. Similar to Poolbeg lighthouse, Dublin.
 519. A black ball high on a staff by day, and a red light by night.
 526. I presented a letter, touching on Question No. 12, to (I believe) Captain Farrer and another gentleman on board the steamer *Argus*, in Lundy Roads, some years since, but never heard anything more about the matter, which is, in my opinion, a very important one.
 527. I cannot give any code.
 528. Critical.
 530. As I said before, they are not required.
 531. Self-registering tide gauges with a large dial.
 533. A ball or flag to be hoisted at tide time during the day.
 536. The present system.
 537. I have formed no opinion.
 541. Balls exhibited from a pole from the top or balcony of lighthouse 20 feet above it. If from a lightship, top of the mast, from half-flood to half-ebb at night, a distinguishing light, to show 3 or 4 miles off.
 549. Do not know.
 552. Can give no opinion.
 554. A ball shown at day, and red and green under the other at night.
 565. The present system for tide signals for day and night I think is good, when well understood and made in proper time, not as they were made at Castles a few months ago, which was the loss of one of the mail packets and some lives. If signal lights are not properly made and well understood, it must be attended with great danger. They also ought to be well understood on board of ships. Therefore, captains, pilots, and those in charge ought to make themselves well acquainted with the light signals from the shore, and I think a proper signal book for that purpose ought to be on board of all ships and vessels.
569. Coloured lights.
 577. Not acquainted.
 579. Tide signals by day; night signals (*see Appendix to Mariners' Evidence*, p. 579.)
 589. As at Havre, in France.
 591. I can suggest nothing better than the present code.
 593. I cannot give any other than that which is now generally adopted.
 598. Have none to propose.
 602. By day the same as now; by night, a rocket or blue light, first signal, 10 feet; second, two rockets or blue lights for more water.
 605. Have no experience on the point.
 606. I have never taken that into consideration.
 613. I think tide lights might be worked by means of a float and gear attached (self-acting by the rise or fall of tide) in a tube connected to shutter; at 10 feet, to open one small light, similar in size to the low light in breakwater light at Plymouth; 15 feet opens two, which would be sufficient for most vessels using tide harbours.
 621. I am not aware.
 622. Let a flag be hoisted on when there is a certain amount of water in any channel; and a coloured light at night, if suitable.
 630. The same as No. 12. A flag by day.
 638. For day signals, on shore, I know of none better than the system now in practice at Havre.
 640. Balls and triangles by day.
 642. Consider tidal signals (night) should be red, to distinguish them from the town lights.
 544. What are in use at present.
 647. The ball by day, and light at night, are quite sufficient.
 648. I would advise coloured lights; say, red, white, green; white, red, white; red, white, red, &c. &c. With three lamps you could make 30 different signals.
 649. That used at Ramsgate—a large cage ball by day, and a coloured light by night.
 651. Lights at entrance of tidal rivers or harbours should be able to show through shades the depth of water in feet, thus or any other number of feet—a thing easily done.
 653. By day, first quarter flood, one ball (perpendicular); second ditto, two balls; third ditto, three balls; high water, four balls. By night, same system of lights (coloured).
 654. I am not acquainted with the system.
 660. Have not had any experience, or studied that.
 666. I am not acquainted with any tidal or floating light signals.
 671. I would hoist a red square flag by day, when the tide was sufficiently high for a vessel to enter the harbour; and I would let off rockets by night half-hourly, as long as the tide would suit.
 674. Have not had sufficient practice in tidal harbours to enable me to give a satisfactory answer to this question.
 675. The present system quite sufficient.
 676. Not having had any experience in tidal harbours I cannot offer an opinion.
 688. Not able.
 691. I am not able.
 692. The present system.
 697. I think by day, black ball for high water; white, half flood; yellow, quarter flood; green, low water; and by night, lights of different colours on the bowsprit, or rockets of different colours.
 698. Flags hoisted by day, and a small light or lights shown half-way up the building of a lighthouse, and of a different colour. The same in a floating light.
 699. Have not studied it.
 704. I cannot offer an opinion, having had but little to do with tidal harbours requiring signals.
 705. The present tide signals are good. They should, where convenient, be kept as distinct as possible from lighthouses and lightvessels placed to warn from dangers.
 707. No opinion to offer.
 708. Red flag by day; red lights by night.
 718. I have formed no opinion.
 720. Light by night, and bell by day.
 730. I do not know what tide signals are used. If for harbour purposes, say one red ball at eight feet, two balls at two thirds tide, three balls when the tide is near its highest, on a vertical line; at night, blue or

red lights in the same way. Where there are two harbours together that possibly might be mistaken for each other, one of them might have the signals on a horizontal line. Flags are difficult to make out with particular winds and calms.

733. Have not turned my attention to the subject.

738. Black balls by day, and coloured lights by night.

741. No.

747. I think one system of tide signals should be universal ; all tide lights of the same colour, and that all pier-head lights inside of roadsteads should be coloured, so as to be easily distinguished from vessels' lights lying in the roads.

754. Never have had occasion to notice tide signals from lighthouses or floating lights ; local pilots should be the best judges.

756. No.

758. One flag (blue), and two balls, during the day, will be quite sufficient to form a code, and an occasional bright flash at night, a warning to keep off (or a green light).

762. Not sufficiently acquainted with the subject.

773. Not studied the subject

777. I cannot say.

778. Leading lights ; the towers by day.

791. Ball in the day and a red light for night.

792. Ball in day-time, and a low and high bright light at night.

793. Ball in day-time, and a high and low bright light at night.

30. Have you ever made any representations or proposals regarding the Lights, Buoys, or Beacons of the United Kingdom?—if so, state to whom—the subject—and the result.

1. I have not.—2. No.

3. Yes ; to Captain Washington, R.N., at the Admiralty, about the year 1845 or 1846, relative to the east buoy of the Ouzé, in the Nab Channel, which buoy, being white, was very difficult to see when much required in windy weather ; that gentleman, I believe, represented my statement at the Trinity House, and ultimately it was replaced by a black buoy, and which it has remained ever since.

5. No.—6. No.

7. Many private representations, rather than official communications, judging it the best.

8. Yes ; to the Ballast Office Commissioners, early in 1858, about the position of the beacons, Castelnaine Harbour ; no reply.

9. Godrevy Lighthouse, in 1855. Admiralty. Site recommended on the stones. Not adopted. Vide copies of communications, &c. &c., relative to lighthouses, ordered by the House of Commons to be printed February 5th, 1858, Mr. Lowe.

10. Frequently, respecting the necessity of placing buoys on newly-discovered dangers, to the Hydrographer of the Admiralty, and which has been done by the Trinity House.

13. I have made a special report of the requirements of the west coast of Ireland, between Galway and Lough Swilly, to the Harbour of Refuge Commissioners ; also to the Dublin Ballast Board, on the want of a light on Straw Island, Aranmore, Galway, and on several occasions to the Admiralty Hydrographers. I am not able to mention any results.

14. None.—15. No.

16. The late Mr. Halpin, about the balls in the lightships on the Irish coast, have been placed in the same position as those on the English coast.

17. Never.

18. When Trinity master here I made several alterations here in our river ; I put a black stripe in front of each lighthouse, which was generally approved of ; but the gentleman who succeeded me put them as they were all white again, which does not consist with reason in such a situation.

20. None.—21. No.—23. None.—24. None.—25. None.

26. In the year 1833 I was examined before a Committee in the House of Commons as to the navigating of Yarmouth Roads in the night. I stated that it was to be done quite easy by mooring a lightship in St. Nicholas

Gat, and one in the Cockle Gat ; the St. Nicholas Gat light was moored not long after, and since that time the Cockle Gat light has been moored. I was at that time a Gat pilot.

27. None.—28. None.—29. None.—30. None.—31. No.—I have.—34. None.—38. No.—42. No.—44. No.—46. None.—50. No.

54. Application was made to the Trinity House at Hull, by the masters trading to the port, for leading lights in the River Humber, which were immediately erected at Killingholme.

55. I have not.—59. No.—60. None.—61. None.

62. I have not, but I was master of the Fraternity of Masters and Seamen in Dundee, when the system referred to at Question 28 was adopted in the River Tay, at the suggestion of the Commissioners of Northern Lights.

64. I have not, for in so doing I considered that I should be unnecessarily interfering with the constituted authorities in whom this power is vested.

68. None.

69. I have never made any.

71. None.—73. No.—76. No.—79. None.

80. As alterations have occurred and come under my notice, I have reported the same to the Trinity Corporation, who have at all times attended to it.

82. None.—87. None.—88. None.

89. Yes. I represented the necessity of 1st, a perch on Rock Patrick ; 2d, a tower on Rock Angus ; 3d, a perch on the North Rock ; 4th, a buoy on the Butter Plodily, all of which have been done by the Ballast Board, and have proved very useful to the coasting trade of that part of the coast.

90. None.

91. Repeatedly, on all of the foregoing subjects, to the Admiralty, the Board of Trade, the Hydrographer, and the Commissioners of Northern Lights. In respect to the lights, generally, I believe, without result ; but with effect, with the Northern Board, in regard to buoys.

92. No.—94. Never made any.—97. No. I have not.—100. No.

104. I wrote the Royal Commissioners and Harbours of Refuge to light Locherpool.

106. No.—107. No.—113. No.—114. No. never.—115. Never.—118. No.—119. No.—120. I have not.—123. I have not.—125. No.—126. No.—127. No.—128. Never.—129. No.

130. See Question 8. Result successful.

134. No, never.—136. None.

137. Yes. In connexion with six other masters of vessels, of the port of Ipswich, I applied for the placing of the Cork lightship (I think in 1842).

140. None.—141. Never.—142. No.

144. To the Commissioners of Northern Lights, and to the Hydrographer.

149. Never.—150. I have not.—157. No.—160. No.—161. Never.—162. Never.—167. No.—170. No.—174. No.—175. I have not.—177. No.—180. I never have.

181. To no one connected with that department.

183. No.—185. I never have.—186. Never.—187. No.—191. No.—193. No.—195. No.—198. No.—199. Never.—201. No.—202. Never.—203. No.—205. None.—206. No.—208. None.

213. Yes. Dock Trustees, Liverpool, Clyde Trustees, Glasgow, as to improvements in the navigation of the Mersey and the Clyde generally ; favourably considered.

215. No.—217. None.

219. I have never made any representations regarding the lights, buoys, or beacons of the coasts of the United Kingdom.

224. No.—228. No, never.—229. No.—231. No.

232. I have never made any representations to any person in the United Kingdom.

234. I have never made any representations, or any proposals, to any one respecting any of these matters.

235. To the Commissioners of the Port of Hartlepool, previous to the present lighthouse being erected on the Hugh headland.

237. None.—242. Never.—247. No.—249. No.—250. No, I never made any.—251. Never.

255. Ballast Board, Dublin, for rock, a bell, Drogheda Bay.

256. No.—259. No.—260. Never.—262. I have not.—263. None.—264. None.—269. None.—275. No.—276. None.—277. Never.—278. No.—279. No.—281. Never.

282. Yes ; to Royal Commissioners on Harbours of Refuge.

283. No, never.—284. No.

285. Publicly, through the pages of the "Shipping Gazette," more than 20 years ago, and often in conversation, when I urged the placing of floats at Lemon and Owers, Shipwash, and Seven Stones, &c.
286. I have never made any.
288. Never.—292. I have not.—293. No.—294. None.—296. No.—297. None.—301. Never.
302. Have communicated with the Trinity Board, and assisted Admiral Bullock in his surveys.
303. Have never had occasion.
309. Not any.—311. No.—313. No.—315. I have not.—316. No.—317. No.—318. I never have.
320. I have spoken to the harbour authorities at Weymouth about the harbour light there; it was rectified after a time, but if a south-east gale sets in out goes the light again.
322. No.—323. No.—324. I have not.—329. I have not.
330. To the Trinity House, Tower Hill, London (personally), about the perches in the River Dee not being of a different description on the starboard and port side of the channel (answer, a local affair), Chester.
331. No.—334. No.—336. No.
339. Yes, as at Question 21, to Captain Washington, R.N., who approved of it.
340. I have not.—342. No.—343. Never.—345. No.—346. None.—347. No.
348. To the owners of the *Saxon King*, to Captain Anderson, at Lloyd's, to some of the underwriters at Glasgow, relative to the position of the South Rock light; the result in progress.
349. No.—350. I have not.
351. See inclosed paper.
352. No.—355. No.—356. No.
359. Ever since 1854 I have made representations in various quarters, showing the necessity of a light on Guernsey, and urged upon our authorities, public bodies, and, through the columns of the "Shipping and Mercantile Gazette," endeavoured to arouse the attention of the Trinity House and Board of Trade to the subject, especially when wrecks occurred, evidently caused by the want of a light there; the result has been the necessity acknowledged, and the building of the present lighthouse.
361. None.—363. Never.—364. No.
365. I did, to Captain Green, Dockmaster, Bristol; in consequence of which one beacon was put up at Nelson Point.
370. I was just speaking to Mr. Stevenson about a light on Sona, and about what colour.
371. I have not.—372. No.—376. No.—377. No.—383. No.—386. No.
388. 1847, respecting Stornaway Harbour; got no reply.
390. No.—391. Not any.—392. No.—394. None.—395. None.—396. Never.—398. No.
399. No, not considering it my province to do so.
400. Never.
401. Yes, formerly (many years ago) to the Trinity House, on several subjects and with various results, too numerous for this paper.
402. No.—406. No.—407. Never.—409. No.—410. No.—414. None.—415. I have not.—418. No.—420. No.—424. I never have.—425. No.—427. No.—429. No.—431. No.—438. No.—440. No.—445. No.—449. None.—451. No.—452. No.—459. No.—461. No.—462. No.—467. No.—470. No.—471. Never.—473. None.
474. I never have before made any representations, never before applied to for the like.
475. Not of the United Kingdom; of the Red Sea, yes; Foreign Office; result, none yet.
476. None.—478. No.—480. No.—482. No.—483. I have not.—485. No.—486. Never have.—487. No.—488. Never.
489. I have never had reason to do so; still I must admit, in a period of 22 years, I have found so much done by the Commissioners to assist us, and to render the approaches to land, sand banks, harbours, &c., less hazardous, and of general good to all shipping.
492. No.
494. I have never made any.
495. Never.—499. No.—500. I never did.—501. No.—502. Never.—504. No.—505. Nil.—509. No.—510. No.—511. No.—512. Never.—514. Never.
518. I stated in a letter (two years ago) to the "Shipping Gazette," the want of a buoy off the south-east side of Arklow Bank; it is a long distance from the lighthouse to Wicklow Head, 16 miles. Many wrecks occur about the middle, as the tides run very rapid, setting across them.
519. None at any time.
521. Never.—522. No.—525. No.—527. I have not.—528. Not.
530. I have made none, nor was I asked for any.
531. No.
532. To Parliament, with a view to the repeal or modification of the light duties, so that the national ships pay for the use of the lights as well as merchant ships, and that the rates charged for duties should not produce a greater revenue than is absolutely necessary to keep the lights up efficiently. No reply yet.
533. No.
535. To obscure several lights on the Banks of the Tyne which might be taken for the harbour lights, to the Trinity of Newcastle. Lights obscured.
536. No.—537. I have frequently talked about, but only wrote one letter to Capt. Bedford, R.N. to bear on the subject.
539. Never made any representation.
541. Latterly, in reply to queries from the Royal Commissioners on Buoys, Beacons, &c.
542. Never.
543. I made a representation to the Northern Lighthouse Commissioners, through the late Procurator Fiscal of Lerwick as to the desirability, almost necessity, for beacons on the Rumbles, above described. The reply I received was, they had no funds applicable.
544. Never.—549. No.—550. Never.—552. No.—553. Never.
562. I have represented the great want of a light between St. Alban's and Durlstone to Admiral Hope, when a passenger with me some short time since to India, and he requested me to forward my views to the Royal Commission.
563. No.
565. I never made any representations to any one, as I think they are of no use without being made from a body of men, and then at times they are taken no notice of.
569. No.—573. No.—577. None.—579. No.
580. Yes, to the editor of the "Shipping and Mercantile Gazette," respecting Falmouth, Lizard, Longships, Godrevy, and Trevoise Head lights; no reply.
589. No.—591. No.
593. I never have, but such has been done from our port.
597. Never.—598. No.
601. Some ten or eleven years since I put one or two articles in the Liverpool papers, urging the placing of a lighthouse at the Blackwater Bank, and I was exceeding glad when I first saw her in December 1857. She carries very good lights. I have heard some complain they mistook her revolving light at first for Tuskar. I think a very little attention would prevent such a mistake as that. Her fixed light can be seen very soon after the revolving light shows when nearing towards her, or by going a few feet above the deck.
603. I have made representations of the buoys on the Middle Sand in the River Humber not being placed in a position to clear the sand, to the Collector of Buoyage.
604. Never.—605. No.—606. No.—613. No.—621. Never.
622. I have often had a conversation with Her Majesty's Surveyors respecting a light on the Black Rock, and the buoying of Carlingford Bay.
623. No.—627. No.—628. None.—642. No.
643. Yes, formerly, and lights have been there adopted on the east and other coasts of England, &c., through Trinity House, London.
644. No.—646. No.—648. No.
649. Not in England. I have in Halifax, where the buoys were mis-placed, and nearly caused me to run ashore in the steamship *Circassian*; result, nothing.
650. No.
651. Yes, I once had occasion to complain of the lighthouse buildings at St. Anne's Port (Milford), being yellow, dark, and dingy, so that even I could not make them out; the reply was civil and evasive.
654. Never.—656. No.—657. No.—660. No.—665. None.—666. Never.—667. None.—668. I have not.—671. Never.
672. I answered these same questions from Waterford about a month since.
674. No.—675. No.—676. No.—678. Never.—679. No.—683. No.—685. No.
686. Yes, published in "Shipping and Mercantile Gazette," 1856 and 1857, on the necessity of signal lights for sailing ships. Present system partially.

687. No.—688. No.—691. No.—692. Never.—693. No.—695. No.—697. Never.—698. No.
699. Often in reference to the old Needles light, to the late Hydrographer of the Admiralty; and in each edition of my little book "Remarks on the English Channel," and later to the Trinity Board, as explained in replies 8 and 22.
700. Have never made any representations.
702. None.—704. No.—705. No.—706. No.—707. No.—709. I never have.—715. I have not.—718. No.
722. The port of Dublin, and has been attended to by the Ballast Office.
372. I represented the necessity of a bell buoy at the turning point of Spencer's Spit going in or out of Liverpool by the Horse Channel (to the Dock Committee); the answer was, "the objections were so weighty that the suggestions could not be complied with." This was in December 1855; but in July 1858, the bell was put there. I also represented to the Admiralty in 1856 the necessity of a fog gun on Holyhead Mountain, and it was placed there by the Trinity House, 1st January 1857.
728. None.—729. No.
730. In 1847, and since, I wrote to the Trinity Board, proposing the alteration of the colours of lights, to denote when vessels were near enough to the edges of shoals or the land. Since then some new lights have been constructed on this plan, and no doubt in a few years almost every fixed light will be on this principle. In 1853 I proposed signal beacons to guide vessels into harbours, &c. when pilots could not get out to sea.
733. Yes, about the year 1848 represented to the Trinity Board the disadvantages of the high position and colour of Needles light. The light is now placed lower down.
736. No.—738. Never.—740. I have not.—741. No.—745. No.
751. Some years ago, to the Dock Committee of Liverpool, upon the necessity of firing a gun in fog on board the North-west lightship. A short time ago, to the Ballast Board of Dublin, for the same to be done on board the Kish. Both to no purpose.
754. I never have.—755. No.—756. Never.
759. Yes; I proposed the desirability of mooring the Needle light to Mr. Walker, the engineer, which was done through his interest with the Admiralty and Elder Brethren of Trinity. I also proposed to Mr. Green, my superintendent, to have a bell put on the Outer Shingles Buoy, which was done through him with the Admiralty.
761. 1st. I mentioned to Col. David La Tarres, of the "Corporation for improving the Port of Dublin," the error in Carlingford Bay sailing directions, on Admiralty chart, and I forwarded to him a copy of the chart, with notice of the error, which he informed me by letter, he had forwarded to Mr. Halpin, engineer to the Board; I also left with Mr. Blair, of the Revenue Department, Warepoint, a copy of the chart, showing the error. 2ndly. I forwarded to Mr. Chas. O. Lever, M.P. a trace of Captain Bedford's chart of Galway (in part), showing the advantage of moving the Mutton Island light to Hare Island, &c.
762. Never.—763. No.
764. For leading harbour lights at Bray Harbour, Alderney, to the Admiralty, which have been placed, and for a beacon on the Grand Anquetier Rocks, near Jersey, which has been erected. To the lieutenant-governor of Guernsey, to place a bell buoy at the entrance of the Little Russet, and to the lieutenant-governor of Jersey, for a buoy on the Diamond Rock, in St. Aubin's Bay, neither of which recommendations have been adopted.
766. Never.—772. No.
773. Yes; to Trinity Board, in 1821, relative to a light to clear Manacles Rocks. Result,—that the question being referred to Falmouth, a lighthouse was built on St. Ann's Point. Also in 1858, suggesting that in the New Needles lighthouse a light from inside should be made available for clearing the Warden ledge. It is now so arranged.
776. I have, through the "Shipping and Mercantile Gazette," in 1853 and 1854, of places named in Answer 23, but nothing has been done.
777. I represented that Buchanness light should be shaded or darkened when bearing S.S.W. $\frac{3}{4}$ W., to warn vessels of their close approach to Rattray Head, on which so many vessels have been wrecked; and I think the principal cause of those wrecks has been the deviation of the compasses, caused by the masses of iron on board the vessels. Rattray Brigs is about nine miles
- to the northward of Buchanness lighthouse, and a vessel will clear the shoal in 16 or 17 fathoms water, with the light on Buchanness bearing S.S.W. $\frac{3}{4}$ W. by compass; but if there were a point, or a point and a half, of westerly deviation on the compass, the vessel would be on shore on Rattray Brigs before she brought the light to bear S.S.W. $\frac{3}{4}$ W.; but if the light were shaded on that bearing, it would prevent all mistakes. A copy of the above was handed to a gentleman who was making a plan of the South Bay of Peterhead, in connexion with the Royal Commission for Harbours of Refuge.
780. Have represented the case, but to no effect.
782. Yes, to the Hydrographer, which have generally, in the case of buoys, been attended to.
784. No.
789. Yes. Remark books sent to the Admiralty in the years from 1845 to 1849, when in command of H.M. Steamers *Alban* and *Rhadamanthus*.
31. If you are practically acquainted with any Lighthouse or Floating Light, the Light of which has been changed from the Catoptric (indicated in the Official Lists by C.) to the Dioptric principle (indicated by D.); and if you have formed any decided opinion as to the superiority of either principle, state it.
- The present South Foreland high light has been lately altered, and now exhibits a very bright light, and is seen at a great distance.
 - Not at all.—I am not.
 - The new electric light at the South Foreland is decidedly the best light I ever saw. I do not think floating lights require to be any brighter than those in use at present.
 - The high South Foreland light has been lately altered, and now exhibits a very bright light.
 - I have not.
 - I have formed no decided opinion, but like the Dioptric best.
 - I have not studied the subject.
 - Cannot say.—20. None.—23. No.—25. No.—27. No.—28. No.—29. None.—30. None.—42. Not acquainted.
 - The late improvement with the high South Foreland light appears to be very superior to that of the former one.
 - The South Foreland high light has been lately altered, and now exhibits the brightest light I ever saw, and is much superior to the low light.
 - I have not.—59. I am not.—60. No.
 - The present South Foreland high light has lately been altered, and now exhibits a very bright light.
 - I have not the official list, and, therefore, cannot form an opinion.
 - No.—71. No.
 - They are both very good, in their relative positions; they are not one better than the other.
 - Not.—82. None.—84. I am not.—86. I am not.—87. Do not know.—90. Do not know.—97. No.—100. No.
 - The low light at Orfordness, east of Suffolk, was altered to Dioptric in 1841; it is a very brilliant light, and observed by unaided vision sooner than the high light. My opinion is in favour of the Dioptric.
 - No.—107. No.—113. I have not.
 - I am not practically acquainted with any.
 - No.—119. No.—120. I am not.—123. I am not.—125. No.—126. No.
 - The present South Foreland high light has been lately altered, and now exhibits a very bright light, and is seen at a great distance.
 - None.—136. None.
 - Am not acquainted with any where the change has been made.
 - I have not particularly.
 - None.—161. Not acquainted.—162. No.
 - The South Foreland is by much better, and floating lightships much better.
 - No.—170. No.
 - I am not practically acquainted with any such lights.
 - Better understood if more simplified, cannot understand the question.

185. I am not acquainted.—186. No.—195. No.—198. None.—203. No.
219. Being acquainted with the South Foreland, the system they have in lighting now is far superior to the old system by which they were formerly lighted.
220. Not acquainted.—224. No.
226. South Foreland upper light much improved.
228. Cannot give an opinion.
229. No.
232. Being well acquainted with the South Foreland lights, I think the system by which they are now lighted is far superior to the former.
233. No.
234. I do not particularly understand or am practically acquainted with the system as here described, but I think from what I do know the Dioptric is the best principle for reflecting the light steady, most uniform, and brilliant.
236. I prefer the former one.
237. I have been a long time at sea, but never learnt the ropes herein specified.
242. Not acquainted.
250. No, I am not acquainted with any at present.
251. I am not.
262. I am not acquainted with the subject.
263. The high light on St. Ann's Head, Milford Haven, is much improved.
275. South Foreland high light is much improved.
276. None.—278. No.
279. The South Foreland upper light is far superior to, what it originally was.
283. I have never observed any of the changes alluded to.
284. No.
285. I recollect of a change being made in the Gull light which rendered it very powerful. Most floating lights are somewhat indistinct, which may arise from the motion of the sea. Dudgeon is the most indistinct, and the most looked for on the coast.
288. I am not.—292. I am not.—301. Not practically acquainted.
302. Have not sufficient experience of the principles of each to form an opinion.
303. Have nothing to particularize under this head.
311. Unacquainted with the difference of the two.
315. I am not; therefore I have no opinion.
316. I should give the preference to the Dioptric.
322. I have no remark to make.
323. No.—324. I have not.
329. I am not acquainted with any lighthouse, &c. in which the change has been made, and, therefore, I cannot offer an opinion.
331. No.
336. All I can say respecting lights is, that a revolving light is seen at the greatest distance.
349. No.—350. I am not.—355. Do not know of any.—356. No.—364. No.—365. I cannot judge.—370. No.—371. I am not.—377. None.
383. The lights at the Girdleness and Kinnaird's Head were changed a few years ago, and I consider the present lights a great improvement.
386. I cannot say.—388. Do not know either.—390. No.—391. Not any.—394. No.—398. No.
401. Yes; and I have no doubt of the superiority of the Dioptric principle where it can be properly carried into effect.
402. No.—406. No.—407. Never.—410. No.—414. No.—420. No.—425. No.—429. No.—431. I know not.—440. No.—445. I have not.—451. No.—455. No.—461. No.—462. No.—470. No.
474. To answer this question I should require to seek information about it, and have not at present the official lists of C. or D.
475. No.—476. None.—482. No.—483. I have not.
486. I am not, and have not, but believe the Dioptric principle to be the best; the lights on the coasts of the United States have a great many of them been changed, but were an inferior light, in the first place, of the Catoptric order, so that I cannot make a comparison in these two cases.
487. I cannot.—488. Not acquainted with any.
490. I find a great improvement by the removal of Cape Clear light to the Fasnet Rock. When on the cape it was frequently lost with fog and rendered no service.
494. Cannot form an opinion.
495. I am not sufficiently informed on the subject to form an opinion.
499. No.
502. I think by removing the Cape Clear light to the Fasnet has been a great improvement.
505. Nil.—511. No.—527. I am not acquainted with any.—528. Not.
530. I have not formed any opinion on them.
533. I prefer the latest improvement.
536. Not acquainted.—537. I am not acquainted.—541. Not acquainted.—549. No.—552. No.
565. I have not formed any decided opinion as lights, but the present South Foreland light, the upper one, is the best that I have ever seen; therefore, lights of that quality surpass all others that I have ever met with.
569. Not acquainted with any.
577. I have not noticed.
579. I really do not know one light that has been so changed, and unless I was informed that such a change was to be made, I can scarcely think it possible to distinguish the D. from the C.
583. I find that Baday light is much better of late years.
585. Several lights have been recently altered in the United States from Catoptric to Dioptric, and they are very much improved in consequence.
589. Not practically acquainted.
591. I have not formed any opinion on the subject.
693. Yes, Kinnaird Head lighthouse has been changed from the Catoptric to the Dioptric principle, and is a very great improvement in brilliancy at a greater distance.
597. Not acquainted.—698. No.—605. No.
606. I have not formed any opinion as to this.
621. No.—622. No.—627. No.—628. None.
636. I am practically acquainted with the South Foreland lights, the higher one of which is of the Dioptric principle, and the lower light of the Catoptric, and have formed a decided opinion as to the superior power of the lower light, or Catoptric.
642. No.—643. Not practically acquainted.—644. No.—650. No.
651. Eddystone, changed and improved. The Dioptric principle properly carried out, with all vertical rays from the lamp reflected horizontally (as in breakwater lights) is decidedly, in my opinion, a scientific and economical application of lights. Our old system of many lamps and reflectors certainly burnt much oil, and gave out much light; but although there were many lamps, much light was lost or absorbed in the lighthouse, *i.e.*, three quarters of it; the single Dioptric lamp sends out all its rays horizontally.
654. I am not acquainted.—660. Am not acquainted, nor have formed any opinion.—665. No.—666. I am not acquainted.—668. I am not.—671. Not.—674. I am not practically acquainted, and cannot give a decided opinion.—675. No.—676. No.—678. None.—679. No.
685. The change in the upper South Foreland light, which has lately taken place, makes what I consider the most brilliant light I have ever seen.
687. The South Foreland light is much more brilliant than the low one.
688. Not had experience to decide.
691. Am not acquainted and have not formed an opinion.
692. Not acquainted.
693. I know nothing of the technical name of lights, but I think the principle of the upper South Foreland light, lately altered, will answer well.
695. Not practically acquainted.—697. Not acquainted.—698. No.—699. Not acquainted.—704. No.—705. No.—706. Not acquainted.—707. No.—709. I am not.—715. I am not, nor am I competent to give an opinion.—718. No.
728. I have not paid sufficient attention to form an opinion on the merits of change from Catoptric to Dioptric.
729. I am not.
730. I am not acquainted with the different principles, or have seen in any official lists. The different kinds of light could be best tested by placing them together, and examining them at different distances, and states of weather.
738. I do not know what has been done to the light on the May Island, but it has been much brighter these four or six years.
741. No.
747. The Cape Le Heve lights, I believe, are Dioptric. I remember, at the time of the alteration that all on board remarked how much brighter they were than the old lights.
754. I am not acquainted with any, nor have formed any opinion.—755. No.—756. None.
758. Yes; from Catoptric to Dioptric. I consider the latter, when used with colza oil, a decided improvement.
762. Not acquainted with any.—772. No.
773. Of the two, I incline to the Catoptric.
777. I am not.
778. The South Foreland is a great improvement.

32. If from your general experience you have formed a decided opinion as to the comparative merits of the two principles named above, state it, and your reasons.
3. I have not.
 4. I think the Catoptric principle the best; because I have always found in my experience a clearer and better vision by reflection than by refraction.
 5. From my experience I have long formed a decided opinion, for general purposes, no better light can be shown than those reflected by Argand lamps.
 10. Not of any decided opinions.
 14. Have never formed an opinion.
 20. None.
 22. The high light on St. Ann's is the best.
 23. None.—25. None.—27. None.—28. None.—29. None.—30. None.—42. Not any knowledge.—55. None.—59. I have not.—60. None.—71. None.—73. I know of none.
 76. Formed no decided opinion.
 82. None.—97. No.—100. No.
 103. In the Dioptric principle the rays of light issuing from the lenses are not weakened by dispersion, losing nothing of their intensity, except what may be absorbed by the imperfect transparency of the atmosphere.
 107. No; I have not.—113. I have not.
 114. I have never formed any opinion.—118. No.—119. No.—126. No.—144. No.
 149. No decided opinion.
 150. I have not weighed this matter sufficient to give an opinion.
 161. I have not formed a decided opinion.
 163. Much better to be seen.
 167. No.—170. No.
 180. I am not prepared to answer this question.
 186. I have not.
 195. I have not thought about it.
 198. Nil.—203. No.
 219. By my own experience, running from the South Foreland, bound to the continent, I have seen the Upper Light much farther distance at the present time than before.
 224. No.
 226. I prefer the Dioptric principle, on account of the improvement at the Upper South Foreland.
 229. No.
 232. By experience, being in the North Sea, I have seen the Upper Light of the South Foreland a much greater distance, as it is much more brilliant than the former.
 233. No.
 234. I have not, from general experience, formed any decided opinion on the merits of the two principles named.
 237. Can you alter the White Lights? You will require to give long notices, and great care in altering lights. It is a serious matter to foreign ship-masters. You would do well to begin in the summer.
 251. I have not.—255. Not acquainted.—272. None.—276. I have not.
 279. The South Foreland Upper Light is far superior to what it originally was.
 282. The Dioptric; subject, however, to the disadvantage, that if its one light gets disarranged, you are in darkness. It is, however, to be preferred for brilliancy, economy, and that it is easily varied.
 283. I have not given that subject any consideration.
 285. I have not attended to the difference.
 292. I have not formed a decided opinion as to the comparative merits of the two principles.
 302. I have not.—303. I have not.
 315. I have formed none.
 316. Because of its magnifying power.
 322. I have not any.—323. No.—324. I have not.
 329. I have had no opportunity of forming an opinion for the reasons stated in answer to No. 31.
 331. No.—337. No.—349. No.
 350. I have not yet formed an opinion.
 356. No.—158. I have not.—361. None.—364. Not.—370. No.—371. I have not.—377. None.
 383. The Dioptric light is much brighter and can be seen a greater distance in hazy and clear weather.
 386. Opinion not formed.
 390. I am led to believe that the Dioptric principle is the best, from the greater intensity.
398. None.
 401. My general opinion is that the Dioptric principle is best on land, but that the Catoptric answers best afloat.
 402. No.—406. No.—407. Never.—410. No.—420. No.
 422. I think that the Dioptric principle is far better than any that I have seen, because the light shows larger at a great distance.
 429. No.
 431. I agree with the last-named principle.
 440. No.—445. I have not.—461. No.—462. No.—470. No.
 475. I think the Cata-Dioptric lights of the first order should always be used.
 476. No.—478. No.—482. No.—483. I have not.—487. I cannot.
 494. I have no reason to state.
 502. Think the Cape light was too high, badly seen in thick weather.
 518. The South Bishop is a good flash light.
 524. I have not formed any opinion.
 528. Not.
 530. I have no opinion to offer.
 533. I know from experience the Needles light to be better since the last improvements.
 536. Nil.
 537. No; I have formed no opinion.
 414. No experience.
 552. Not sufficiently acquainted as to give an opinion.
 569. Have not formed any.
 577. I have formed none.
 578. Dioptric the best when in order, but most liable to disarrangement.
 582. I am not prepared to say which principle is the best, but the light exhibited at Madras is the best I have ever seen; the light at Cape Otway is also seen at a great distance.
 585. Experience on the coast of the United States has proved to me the Dioptric is superior.
 589. No.
 591. Cannot decide.
 593. The Dioptric is much the better at a distance, and seen bright at the time it appears above the horizon, and for a fixed light is preferable.
 598. No.—605. No.—606. I have not.
 608. I think the Dioptric principle is the best.
 621. No.
 622. I know of no change in the lights I pass.
 627. No.—642. No.
 645. I have not studied the subject.
 650. I have not.—654. I have not.—660. Have not formed any opinion.—665. No.
 666. Have no experience of the two lights named.
 668. I have not.—671. I have not.—675. No.—676. I have not.—691. Have not formed an opinion.—692. Not formed an opinion.—695. No.—704. Have not formed any opinion.—None.—705. No.—760. No.—707. No.—709. I have not.—718. None.
 727. Where the standing or fixed lights can be used without interfering with other lights adjacent, I think them best.
 729. I have not.
 730. Lights on the principle of that at Cape Grisez might cause mistakes as to the distance from it, by appearing very near a long way off.
 738. Knowing very little of the two principles, decline to give an opinion.
 741. No.
 747. Why I think the refracted lights better than the reflected is, that on nearing them they are less brilliant, thus giving a better opportunity of seeing objects near and around one. A pier head, for example, is better seen with such a light on it than with lamps and reflectors. I have experienced this on entering Havre on a dark night since the change.
 754. Have never formed any decided opinion.
 755. No.—756. Formed none.
 758. The refracted light is much clearer, and more easily recognized from a vessel's light than the reflected.
 762. Not acquainted with the principles in question.
 772. No.
 773. See Answer to Question 31.
 777. I think the Dioptric principle is the best.
 782. Dioptric, as most brilliant.

APPENDIX TO MARINERS' EVIDENCE.

APPENDIX TO ANSWERS OF P. D. DODD, No. 579.

EAST COAST OF UNITED KINGDOM.

10. Notwithstanding I prefer the gong to all other fog signals, I would confine them to floating lightships and retain the bell in lighthouses, altering the mode of tolling, however, in order to distinguish them from those on board ordinary ships. I do not know the size of those in lighthouses, but suppose them to be much larger than those now in use in the merchant service, agreeable to the Admiralty Regulation. With regard to the mode of tolling allow me to suggest the following, namely, 3 tolls to be given in succession, which would occupy 6 seconds; pause 12 seconds, then 3 tolls more, and then rest 10 minutes, when the same process should be repeated as long as the fog continues; other lighthouses to vary the time, number of tolls, &c. Some such mode might be adopted with the gong, in order to distinguish one lightship from another; for instance, supposing the Hasbrough Sand gong is struck twice in quick succession, pause 4 seconds, repeat the process 8 times and rest 15 minutes, repeating the process as long as the thick weather continues. Newarp, strike the gong 5 times in 20 seconds, pause 2 minutes; repeat the process 10 times and rest 15 minutes, when the same process may be repeated during the fog. By some such mode as the above one floating lightship could be distinguished from another, and would be of great utility, more especially to those ships coming from seaward.

15. Hendon Rock, a dangerous shoal, lies about $1\frac{1}{2}$ mile S.S.E. of Sunderland, S. pier-head; has been very much neglected, for when the buoy was driven away 2 or 3 years ago, it was replaced by a small piece of timber, very difficult to see; and a stranger unaccustomed to such buoys would never suppose it was put there to indicate the presence of such a dangerous shoal. If it is not practicable to keep a buoy from breaking adrift, why not have a beacon in such a position that by being brought in a line with the light-house, or any other remarkable object, would be good leading marks, and two beacons at Hendon for thwart marks.

16. In 1855 I was standing in, having been knocking about all night outside Yarmouth Sands, wind S.S.W., hazy with rain, lead going; mistook the S.W. beacon buoy on the Newcome for the N.E. beacon buoy on the Barnard; touched the ground in stays, but came round and off. I am informed that the staff and ball on the former is since taken away. Now, I think, that when two beacon buoys are so close to each other to mark the entrance of a channel, as in the case of Pakefield Gat, that they should differ in shape as well as in colour; thus,

19. I am no advocate for superfluous lights, and if it is thought that by placing one at S. Scroby and another at the Stanford would be too many, then have but one, and let that one be the former. I know that I am liable to censure for proposing the discontinuance of Lowestoft low light, for it will be asked, "How is the stranger to know Lowestoft high light from Winterton, when coming in from seaward, say, to the southward of Smith's Knoll?" Now, as this is a very dangerous intricate navigation, indeed the most intricate on the east coast, the only answer I can give is, if practicable, change Lowestoft high light from fixed to intermittent, and then every light in the vicinity will be distinguished from each other.

21. I beg to suggest an alteration in the colour of the floating lightships, which is as follows:—Assuming the Dudgeon to retain her present colour (red) then have Hasbrough Sand black and white (perpendicular stripes). Newarp, all plain yellow or cream colour. Shipwash, red and white (diagonal stripes). Galloper, half red, half white. Kentish Knoll, all green; and the Gull Stream, tricoloured (perpendicular); so that every one on the east coast to the South Sandhead could be distinguished from each other. My reason 's thus,—supposing a ship to get in collision with one, say Newarp, which is not unfrequently the case, owing to the tide setting so much athwart, and carries away one of her (Newarp) masts. A stranger coming in from seaward having had no observation for two or three days falls in with, makes her out to be a floating lightship, because she is painted red and other peculiarities, but cannot make out her name. He knows that the Hasbrough Sand lightship has two masts; he also knows that the Galloper has two; then the question arises, "Which of these two is it?" A strong tide drifts the stranger away, and is bewildered,—lost, till he falls in with a pilot, if nothing else harder picks him up. I quote an instance:—

I was at Yarmouth, I think in the winter of 1854; a little foreigner from the Baltic made a floating lightship before dark, but not near enough to make out her name. By his reckoning the foreigner was much farther to the southward, drifted out of sight to the northward; fell in with a fishing smack, hoisted his colours, and got a man on board who took the little craft into Yarmouth Harbour, and then made a claim of salvage. Now if the other lightships had been painted any other colour than red, it would have at once convinced him that it was the Dudgeon.

23. Supposing that in the event of a war with some of the northern powers, and we do not know how soon the event may take place, it would be necessary to have a North Sea squadron, with five or six frigates of observation. The only channel into Yarmouth Roads in the night is the Cockle Gat. Then, supposing that squadron to be overtaken by a gale from N.E. or E.N.E. outside Yarmouth Sands,—and it might be at the very entrance of Hewett's Gat, which has water sufficient for the largest line of battle ships; the night is too dark to make out the buoys, and although the lights are all visible, yet there is not one to guide them into the outer entrance. In 1856 I was taken aback with a gale from S.S.W., a dark winter's night, in a deep-laden collier. Stood into 14 fathoms, a little to windward of the Gateway, but too dark to make the buoys. Stood off and on all night, and fetched Winterton the following morning; whereas, if there had been a floating light at the South Scroby, could have gone boldly in, and got to a safe roadstead off Yarmouth. It has been always my impression that if such a light had been established, that excellent, lamented officer, Capt. Hewett, would have survived that dreadful night, and found refuge in Yarmouth Roads.

25. In 1847 I was at Littlehampton. It was then in contemplation to have a coloured light on the east pier. I, with several other shipmasters, was applied to by one of the local committee, or commissioners, whose name I have forgot, to give an opinion as to the comparative merits of each description of coloured light, when I at once pronounced the red to be the best. My reason was as before stated. That opinion was reported, and Littlehampton light was made a red.

29. Day tide signals.—For 10 feet, one red flag, half mast when it is not high water; flag and one black ball for 11 feet, flag and 2 balls for 12 feet, flag and 3 balls for 13 feet, 2 flags for 14 feet, 2 flags and 1 ball for 15 feet, 2 flags and 2 balls for 16 feet, and when it is high water the upper flag to beat the mast head. One ball between 2 flags for 17 feet; the same, with an additional ball below, for 18 feet, with 2 additional balls for 19 feet; with 3 additional balls for 20 feet, and three balls between 2 flags for 21 feet. With regard to tide signals by night, it occurred to me about 10 or 11 years ago that a lantern could be so constructed as to show the ship's name, where bound or from, latitude and longitude, &c. I made a temporary one of pine board, 7 feet by about 14 inches in depth, and 12 inches in width, with 2 faces of buckram. The first trial, which was in these roads, the name was, with the aid of a night glass, read from the south pier, a distance of more than a quarter of a mile. Now, I think a tide signal might be constructed upon this principle, denoting the depth of water by black balls; thus, for 10 feet 1 ball; for 12 feet 2 balls; and for every additional 2 feet rise of tide 1 ball. Such a lantern, if it merely showed the name, would be a great improvement in our floating lightvessels.

NOTICES OF NEW LIGHTS, BUOYS, BEACONS, &c.

With regard to these, I think the present system of making known to the public any alteration is inefficient. What seems to me to be a much better, is cards with a diagram. For instance, supposing the floating lightships to have their colour altered as suggested, say Hasbrough Sand, for example; delineate her on the card, set off the bearing and distance of Cromer light, Hasbrough high light, and the Cockle light. Send two or three of these cards to every sea port in the United Kingdom, colonies, and foreign countries, where the shipowners and underwriters could have as many printed as would be necessary for the use of their captains. It is a notorious fact, and I know it from experience, that captains have gone into the Custom House without ever noticing these notices, and have gone to sea unconscious of any change having taken place. I was away on a foreign voyage when the St. Nicholas floating light was removed, knew nothing of it till I was going

out of the Gateway, and should have gone on the wrong side had the mate not informed me of the removal.

Sr. LAWRENCE.

It would be presumptuous for me to offer any suggestion after the inimitable survey by that excellent officer, Capt. Bayfield, although I have, on some occasions, wished there had been a light on the Bird Rocks, more especially when coming down from westward. We are apt to give them too wide a berth, and overrun the distance. The wind blowing strong from the westward, have found it difficult to clear Cape Ray; for of all ships in the world, I think those timber laden are the most leewardly; therefore, by having a light, would enable them to haul close round (provided the weather be clear), and have smooth water under the lee of the Magdalenes, more especially in the winter season, and the sky assumes a threatening appearance.

With regard to beacons, I think the foreigners, more especially Swedes and Norwegians, are far in advance of our North American colonists. I am of opinion that a beacon on the summit of Cape Rosier, or thereabouts, would be of great service, particularly to those ships which have nothing but their dead reckoning to depend upon. There might be one or two higher up, say, at the Great Pond River and Magdalene River, would be excellent landmarks; for it often happens in a fog, that by going to the masthead the top of the high land can be distinctly seen, so that by getting a sight of one of these beacons would be a good departure, when a fair course could be shaped to clear Anticosti. A friend of mine (Mr. Mortimer), of Poole, was mate of a ship beating down late in the fall, 14 or 15 years ago. The captain kept in shore to get a departure, having no chronometer, when a gale came on from the northward, drove the ship ashore, and was wrecked. The crew got to a small settlement, where they wintered. There is plenty of timber in the locality, and beacons built of that material, particularly red pine, and kept well painted, or stuffed with coal-tar, would last for a vast number of years, and cost little. I think the pyramidal form is the best that can be conceived; and, in order to make a distinction, see Diagrams.

The same may be said with respect to Newfoundland. With the exception of St. John's, and one or two other places where lighthouses have been recently erected, I do not know of one landmark (artificial) on that iron-bound coast. I think it was in 1834, I was bound to Carboniere, in Conception Bay, and got into the wrong (western) instead of the eastern entrance, passed between two sunken rocks not more than two ships' lengths apart, with neither buoy nor beacon on them. Got safe in, however, to the astonishment of the natives, who were watching me from the wharf. My consignee told me that he had not known a ship come into that passage for many years. Since then a lighthouse has been erected on Carboniere Island.

I may also name Trinity Harbour, one of the finest in the world, was, when I was there, without a beacon on the north shore to make its entrance. Now, if they have no timber, they surely do not want for rocks and stones, the same kind of material with which the Swedes and Norwegians build beacons, which can be seen three or four leagues distant.

I almost forgot to state, that it is the opinion of many coasters that leading lights at Yarmouth for the Cocksleek would be of great utility. I concur in that opinion; but then there is another consideration, and, as I observed before in answer to Question 19, that I disapprove of having too many lights, as they are conducive of confusion to the stranger coming in from sea. I confess that this is a question which requires argument, therefore let the majority decide.

In conclusion, I know that I shall incur the displeasure of a certain party here by my endeavours to increase the amount of light dues (by proposing another floating light); but for that I care not. I should be happy to make any pecuniary sacrifice, did I think that it would have a tendency in promoting the welfare of England's bulwark, or saving one ship's crew from destruction by shipwreck.

I am, Sir,

Your obedient servant,
PETER D. DODD.

(Reference at 15. "Hendon Rock.")

BUOY ON THE HENDON ROCK.

To the Editor of the Shipping and Mercantile Gazette.

Sir,—By your inserting the following in your valuable Paper you will oblige:—On Monday, February 14, the schooner "Mary Anne," under my command, left Rochester with a fair wind, &c., for Sunderland. All well until

Feb. 17. At 9.30 p.m. we saw the buoy on Hendon Rock (black). The wind at the time being W. by N., it was necessary to keep as close in shore as possible in order to arrive at our port. We kept our vessel about half a cable's length outside the buoy, thinking the buoy was on the outside of the rock—where it ought to be. The vessel came to the ground, where she remained about one hour, the buoy bearing W. by S. half a cable's length, which bearing makes the buoy direct on the inside, and in a position to lead vessels directly on to it. How it happens to be there I do not know. It could not be removed by the winds, as they have been prevailing from the S.W. on this coast for the last three months or so. I understand the buoy on Hendon Rock the Sunderland Dock Company are bound to keep there, in a proper place and in repair. Should such be the case, are they not liable for the damage done to my vessel through their neglect? When she came off she was nearly full of water, and I had to take assistance into Sunderland and to pay 5*l.* and 10*l.* for a steamer, besides considerable damage to the vessel's bottom. Your attention to this will much oblige,

Your obedient servant,

GEORGE BUCHER.

Newcastle, Feb. 18, 1850.

The following returns were received in 1860, too late for insertion in the Mariners' Evidence.

91.

Admiralty Survey, Oban,
May 3rd, 1860.

SIR, I consider it my duty to offer the following supplementary evidence on the necessity for additional buoys for the navigation of this coast, and the opposition to their being placed, even should my communication be too late to do more than strengthen my former reports made to the Royal Commissioners upon like subjects.

Resulting from my survey of last year and information received, I recommended several buoys being laid down in the MAIN CHANNEL leading between the Crinan and Caledonian Canals, and also round the N.W. coast of Scotland. These recommendations were fully explained with illustrations, to the Commissioners of Northern Lights, and were, with few exceptions, approved of and submitted to the Trinity House. This Board *rejected all*, giving as their reason, that although they could see no objection to the buoys being laid down from private sources, the object was of so local a character that they could not recommend the Board of Trade to place them at the expense of the Mercantile Marine Fund, apparently forgetting that in the *same channel* above and below the position now proposed to buoy, two lighthouses are building, and several buoys have been laid down through their sanction and approval. This decision was appealed against to the Board of Trade, who have likewise rejected the recommendations with only one exception, but without giving any opinion as to the requirements being of a local or general character.

There is not a danger proposed to be buoyed upon which several vessels have not struck, some of a large size, causing total wreck, much injury, and long detention, from the necessity of unloading. It should be also borne in mind that the great expenditure upon the Caledonian Canal should induce every encouragement to its more general use, by facilitating the direct navigation through its approaches, and also that these requirements have been repeatedly urged by an extensive trade, compelled to use these channels; yet the appeal is in toto and unhesitatingly rejected, and by one imperial Board at least (from arguments used), apparently unacquainted with the district, its dangers or tidal influences.

I have, &c.,
E. J. BEDFORD,
Commissioner.

794.

1. From Portsmouth to the Land's End.
3. Yes; with two exceptions, namely, one, Durlstone on St. Alban's Head, and the other, Berry Head, near Torbay.
8. At Durlstone on St. Alban's Head, and on Berry Head.
9. Yes; as regards the Nab, Warners, and Calshot Lights; but have not yet had opportunity of witnessing the new floating light on the Shambles.
23. A lighthouse on or near Durlstone Head, as a guide to the Needles, which should clear St. Alban's Head when open; and would assist vessels making for

Poole. Also a lighthouse on Berry Head, to assist vessels making for Torbay, (or on the rocks near Hope's Nose, commonly called Bob's Nose, the northern point of Torbay).

30. I have represented the want of a light on or near Durlstone Head to the Secretary of the Trinity House, when the "Tyne" was wrecked near there.
34. Owner of the yacht "Brilliant," 480 tons (O.M.), of Southampton.
35. G. HOLLAND ACKERS, 7, Hyde Park Terrace, London, W.
36. 23d April 1860.

795.

1. No; I have passed nearly the whole of my life in India, and am not, therefore, competent to reply to these questions.
2. No.
17. Black.
18. Never.
19. I have not studied the subject, and therefore, offer no opinions.
33. I have not served at sea.
35. J. GRANT LUMSDEN, Kelstone, Milbrook, Southampton. No occupation.

796.

1. Bristol Channel, Irish Channel, English Channel.
2. Coast of France, Spain, and Portugal, Italy.
3. Yes; but not so well lighted as the coast of France.
4. Better than Spain and Portugal; inferior to France.
5. France; England; Spain and Portugal; Italy.
6. No.
7. British, Beachy, Lundy; French, Tour de Cordouan, I d'Yeu, Barfluor.
9. I think they are not bright enough in general.
13. The Irish banks off Wicklow, &c., are very deficient in buoys.
14. France is best supplied; you can almost always see two lighthouses at one time, often three.
15. Yes, in the Irish Channel.
17. Depends on the light.
23. I would suggest the placing of a beacon on a dangerous rock in the centre of Holyhead Harbour; another on a similar danger in the centre of Alderney Harbour; another upon the Rundestone off Land's End. Also, I suggest a red light on Grasholm, near the Smalls.
25. Green is decidedly the worst colour for light. The red used is usually of too dark a colour; orange red is the best.
26. Alternate flashes of red and white light are useful in distinguishing lighthouses and lightships.
28. It would be advisable, if possible, that the same coloured buoy should always be left on the port side in entering a harbour.
34. "Capricorn;" 418 tons; 60 horse power.
35. C. R. M. TALBOT, M.P., Penrice Castle, Swansea.

797.

1. I have sailed round the English and Scotch coast, and visited the Dutch and French coasts.
3. Yes.
6. No.
8. No.
9. No; I think all the floating lights should revolve to distinguish them from ships at anchor.
11. Yes.
12. No.
13. Yes.
16. Yes; see 28.
17. Nun buoys of red or black with a staff and ball.
18. No.
21. The Eddystone light is painted white, with red bands, which gives it the appearance of a ship before the wind. Red alone would be better.
24. Coloured lights are much less distinct than white. I consider them only applicable to narrow channels and harbours. They are very useful where the change to coloured indicates that you have passed the danger, or that you are out of the proper channel.
28. Yes; I consider that in all channels the buoys to be left on the starboard hand should be of one colour and

shape, and those to be left on the port hand a different colour and shape, and those on the points where the channel divides, which may be left on either hand, should be partly coloured and different in shape.

33. No.
34. I am the owner of the "Plover" yacht, R.Y.S., of 70 tons.
35. HENRY BROWN, Colonel in H.M. Indian Army, 28, Soho Square, London.

798.

1. Belfast Lough.
8. On the shoal off Carrickfergus, in the Lough of Belfast.
35. DUFFERIN, 1, Spring Garden Terrace.
36. 24th March 1860.

799.

1. With the south and the west coast of Great Britain, and the south coast of Ireland, as lighted, &c. eight years ago.
2. The west coast of Africa and the east coast of Australia.
3. Yes.
4. Much better.
6. The floating light in Liverpool Bay frequently adrift 20 years ago.
7. Port Fleetwood Light, and Cape Moreton Light, the latter 34 miles; former dioptric, the latter catoptric.
8. Nowhere, except in the Tay, where I suggested (in 1848) a lightvessel.
9. Quite so.
10. Yes.
11. Yes.
12. Never.
13. Yes.
14. Much better.
15. Many have been added at my suggestion in Liverpool and Morecambe Bays.
16. Not aware of any.
17. The tall black nun buoy.
19. Besides local lights, I would light all commercial sea-boards, so that the ranges of light should overlap.
20. Two to three hundred feet; but the lower the better, looking to the range required.
21. I cannot.
24. Red lights are perfectly distinguishable.
25. I believe that red is the only tint which does not recede after being reflected or refracted four to five miles.
26. Red for lightvessels, and for such lighthouses as have no back ground, otherwise white towers.
27. Guns and gongs for foggy weather, blue lights and rockets at stated hours, during hazy nights.
28. Black (beacon or bell) buoys for fairways. Then (looking inwards) black nuns on starboard hand, red cans on port hand; black and white vertically striped nuns for mid-channel banks passable on either side.
29. A lower chamber lighted in the proper aspects while the bar is navigable for such vessels as trade with the port.
30. Frequently between 1829 and 1848, to the Trinity House of London, and the local authorities of Liverpool and Port Fleetwood, and Admiralty, regarding Port Patrick Light.
31. Not aware of any such change, but I prefer the dioptric as affording a steady unbroken light, whereas the catoptric yields its intensity more within the focal rays of each reflector; unless two rows of reflectors are resorted to, then the catoptric is the safer lantern of the two, as the former depends upon one lamp.
33. Nearly 50 years.
34. H.M.S. "Herald."
35. HENRY MANGLES DENHAM, Captain, R.N., F.R.S., surveying the local sea Western Pacific.
36. Sydney, 24th December 1859.

800.

I have no knowledge at all on the subjects
J. LITCHFORD.

801.

1. Harwich to Lowestoft and London.
3. Yes.
6. About 15 or 16 years ago, I remember the Sunk light, off Harwich, going adrift, and though the light was not shown nine vessels went on the Sunk Sands.
7. Lowestoft and Cape Barleur the furthest of the two.
8. No.
9. Yes.
10. Yes.
11. Yes.
12. No.
13. Very well.
15. Never.
16. No.
17. A black conical buoy.
18. Never.
25. Red.
26. Red, because no other vessels have the colour.
27. The gong.
30. Never.
33. An officer in the army.
34. The owner of the "Egret" schooner yacht, (N.M.) 48 tons.
35. JOHN BERNERS, Wolverstone Point, Ipswich.

Islands, and one on the northernmost point of the group.

On the western coast of the Shetlands there is, however, no intermediate light between those on the extreme points of the group, a distance, as already stated, of about 70 miles. This coast is in its general features what may be termed an iron-bound one. There are several places of shelter on it, but very difficult to find or enter by a stranger, and frequent shipwrecks continue to take place on it.

There is a very fine sheltered haven on this coast, called "Vaila Sound," completely land locked, being shut in from the west by the Island of Vaila. It has two entrances, one (the best) leading into it from the S.E., the other lying about east and west, affording the means of entry and departure with any wind. The haven itself is capacious, with good anchorage in a moderate depth of water.

A light on the S.E. end of the Island of Vaila would, I consider, be very useful, both as an intermediate coast light for the west coast of Shetland, and as a leading light for the S.E. entrance to Vaila Sound, as a Harbour of Refuge for vessels caught in a westerly gale off that dangerous coast.

W. ANDERSON.

29th March 1860.

802.

1. Yes; the coasts of the Shetland Islands
2. Not particularly as to their lighting.
3. Not the western coast of the above islands.
4. Cannot give an opinion.
6. No.
8. On the west coast of the Shetland Islands. See Paper annexed A.
9. I believe so.
10. I do not know.
11. I do not know.
12. No.
13. Cannot give an opinion.
15. No.
16. Cannot say.
18. No.
23. See paper annexed A.
30. See paper annexed A.
33. In the Royal Navy 1810 to 1815. More lately in passages and yachting, North Sea, Mediterranean, and British coasts.
34. Steam yacht "Norseman," 200 tons, 40 horse power, port of London.
35. W. ANDERSON, Senior Managing Director of the Peninsular and Oriental Steam Navigation Company, 122, Leadenhall Street, E.C.
36. 28th March 1860.

A.

MEMORANDUM on Lighting the West Coast of the Shetland Islands.

Until within these few years past, the coasts of the Shetland Islands were very inadequately lighted.

That group of Islands, as the chart will show, lies between the 59th and 61st degrees of north latitude, and nearly on the meridian of Greenwich, stretching in nearly a S.S.W. and N.N.E. direction about 70 miles. They are in the track of vessels bound to and from the North of Europe, say Archangel, Norway, the Baltic, the western ports of the United Kingdom, North America, and the Whale and Sea Fisheries, &c.

The only light on their coasts, until recently, was one on the southern extremity, on a point called Sumburgh Head.

Scarcely a winter passed without several ships being wrecked on them, and in the winter of 1847-8, no less than fourteen vessels were totally wrecked, the crews of the greater proportion perishing, all in the neighbourhood of a group of small islands called Skerries, surrounded by sunken rocks lying off the east coast of the principal island, about half way between the southernmost and northernmost points of the main group.

The writer, who then represented the county of Orkney and Shetland in Parliament, brought the subject under the notice of the House of Commons. The Commissioners of Northern Lights soon afterwards directed their attention to the lighting of the Shetland coasts, and now the east coasts are well lighted by four lighthouses, viz., the original one on Sumburgh Head, a light on the Island of Brassay Sound or Lerwick Harbour, one on the Skerry

803.

1. Am well acquainted with the greater part of the United Kingdom. In my certificate of competency, No. 720, is following notation. "A good English and Irish coasting pilot and intelligent master."
 2. Am acquainted, but not sufficiently so to understand their position in respect of this inquiry.
 3. Much improvement has been made in this respect within the last 20 years, and there is room for still further improvement.
 6. Have seen the Kish lightship adrift in an easterly gale under sail running up to Dublin, about the year 1844 or 1845, when *seen vessels were wrecked in Kingstown Harbour*, of which I was an eye-witness.
 9. Generally speaking I should think they are.
 10. Most certainly not. See accompanying letters relative to Kish floating light, Kingstown, and South Stacks.
 11. I do not.
 13. I do not. See accompanying memorial.
 15. Have been instrumental in inducing authorities to place lights and beacons in several dangerous positions. Those which appear to me of most importance in this locality are referred to in accompanying memorial.
 17. Large nun buoys coloured black, with staff and ball at turning points and particular positions, and bell buoys for fairways at bar and other harbours, if of sufficient importance to warrant the outlay.
 18. Applied on behalf of Chester and Holyhead Company in July 1850, to Trinity House and Ballast Board, Dublin, for a return of a sum exceeding 1,005*l.* Received in November same year upwards of 891*l.* 18*s.* 2*d.* The Company's vessels had been charged twice instead of once in 24 hours.
 20. Am of opinion that the height of a light above the level of the sea should in few, except in special cases, exceed 150 feet.
 21. Am of opinion that Bailey Light, Howth, should be changed in its character to prevent the possibility of mistaking it for the Kish (when end on) or Poolbeg before half tide light shows.
- The Skerries should have a red light so placed as to enable vessels to clear the Coal Rock, and to be lost sight of immediately on nearing its dangerous locality, where many valuable vessels have been lost.
23. See accompanying memorials, referring to Main Piscar Rock, Holyhead Harbour of Refuge, and Kish Light.
 25. Much depends on the construction of the lamps. Have seen green, red, and blue at about the same distance when the shades are not coloured too dark.
 26. Am of opinion that white for lighthouses, and red for lightships, is suitable, as at present.
 27. Guns, most decidedly, fired at regular intervals and properly advertised where applicable.
 29. Certain number of lights red, white, and green in triangular form, to denote number of feet at night, and balls in similar positions for day.
 30. To Ballast Board, Dublin, for floating light near Blackwater Bank, and buoy off east end of ledge near South Rock Lighthouse, North Channel; complied with. A light on North Perch in the Clyde, and various other improvements; greater part complied with by Clyde Trustees, the light in particular. Applied and obtained permission to erect leading lights in Cork

Harbour; suggested better system of buoying; complied with also. And for additional lights between Kinsale and Waterford, in common with others, complied with, although not as suggested.

33. Thirty years; commanded twenty vessels at different periods.
34. Command vessels occasionally, but holds the post of Manager of the Chester and Holyhead, London and North-Western Railway Company's Steam Vessels.
35. THOMAS HERTLE, Superintendent C. & H., L. & N.W.R., Steamboat Department, Holyhead.
36. Holyhead, 29th November 1859.

S04.

1. From the Lizard to the Land's End.
2. I am acquainted with several parts of the coast of France, Spain, Portugal, Greece, Ceylon, Mediterranean, Cape of Good Hope, Africa, but not well.
3. Yes.
4. Yes.
5. Yes.
6. No.
7. Lundy Island Light and Cape Grisnez Light; Lundy Island Light seen at the greatest distance.
8. A light much wanted W.S.W. of the ridge situated in the Straits of Dover.
9. Yes.
10. Yes.
11. I cannot say.
12. No.
13. Yes.
14. Yes.
15. I have; but buoys are now placed on these parts.
16. No.
17. Conical and black.
18. No.
20. No.
21. Dungeness Lighthouse black instead of red.
24. Yes.
25. White light for high lights; red lights and coloured lights for low lights.
28. All buoys going up channels to be uniformly the same kind on the port, and uniformly the same kind on the starboard edges of channels.
29. I prefer balls.
30. No.
34. Yacht "Freak," 63 tons, Preston.
35. D. WOOD, Colonel, Royal Horse Artillery, 22, Green Street Park.

S05.

1. I am acquainted generally with the coast of North Wales, and that of Anglesey and Caernarvonshire in particular.
2. Not well acquainted with any.
3. Generally speaking certainly, and a great improvement made within my recollection.
4. As far as my acquaintance goes I should say better.
6. Never.
7. I do not think there is a better light anywhere than the Lizard.
8. I think a floating light to denote the position of the Sarn Bodrig, in Cardigan Bay, would be of service.
9. Quite sufficiently so.
10. I have no experience in any fog signal except the bell at the Copeland, which is very efficient.
11. As far as I know I should think they were.
12. I cannot say I have.
13. Generally, yes. Perhaps there may be some dangers still requiring them.
15. Not lately.
16. I am not.
17. I should say can buoys.
18. No.
24. All the lighthouses with coloured lights that I have seen are sufficiently distinguishable.
30. I made last year a representation to the Trinity House that the beacon at the east entrance of the Menai Strait being black was not sufficiently relieved from the dark high land opposite, and suggested its being made white, which was partially done.
33. I have never regularly "served at sea," but have been more or less in the habit of going to sea all my life, commanding cutter, schooner, or brig.
35. T. P. WILLIAMS, Lieut.-Colonel Commanding Royal Anglesey Light Infantry.

S06.

1. With the south coast of England from the Isle of Wight to the Scillies.
2. Not well acquainted.
3. Yes.
6. No.
7. The Start Light shows further than any other light with which I am acquainted.
8. Not on any part of the coast I have named above.
9. I think those that I have seen are so.
10. I am not sufficiently acquainted with hem to judge.
12. No, not on the above named part of the coast.
13. Yes; always speaking only for the ports I know.
15. No.
16. No.
17. Black, conical shape.
18. No.
25. I think red the next best colour to white.
26. I think red the best colour for lightships, and white for lighthouses. If there are two of the latter at one spot one of them to be striped red and white.
30. No.
34. Owner of cutter yacht R.Y.S. "Caprice," of Cowes, 56 tons.
35. CHARLES BARING, Lieutenant-Colonel, 1, Chester Place, Chester Square, London, S.W.
36. 29th March 1860.

S07.

1. I am well acquainted with the coast of Scotland between Oban and Kyleakim, in the Sound of Skye.
2. I have some knowledge of the coast of the Mediterranean, especially between Toulon, Genoa, and Leghorn.
3. Very tolerably.
4. I think that the above-named Mediterranean coasts are perhaps better lighted than any other with which I am acquainted.
7. I have seen the light at Genoa I think further than any other light.
13. Many buoys and perches might be advantageously supplied on that part of the west coast of Scotland with which I am acquainted.
15. There are many dangerous rocks of the coast between Ardnamuchan Point and Rhu Arisaig, which might be advantageously buoyed, and many of the lochs on that coast would be useful as places of shelter in bad weather if the channels into them were sufficiently buoyed.
16. There is a false entrance to the harbour of Arisaig, otherwise called Loch Na Gaul.
It was proposed by the officer superintending the coast survey on that coast that a beacon should be erected on an island called Lingamore, to enable vessels approaching from the north to distinguish the true from the false entrance. For some reason or other his proposal was not acceded to. I think the proposed beacon would be very useful.
23. See answer 16.
34. Owner of the yacht "Camilla," of London, of 170 tons; have been in the habit of navigating her myself for many seasons.
35. F. D. P. ASTLEY, 67, Eaton Square, London, S.W.

S08.

- 1, 2. Navigated generally, but not "well acquainted."
3. I think the coast is generally well lighted, and that too many lights are a serious evil.
4. Yes.
6. No. Only accidentally. I have known the two lights of the Sevenstones on the bearing of S.S.W. to make as one, and steered for them as for the Longships, and not discovered the error till within two or three miles.
8. I may have felt the want under circumstances, but should not on that account recommend them, where confusion under other circumstances might be created.
9. Perhaps not. There might be improvements in that respect. All floating lights might be of one colour, reserved solely for that purpose.
13. Pretty well. There is room for improvement.
14. In the Gulf of Finland and on the coast of France staffs are much used, but our coast not being so iron-bound I should say our system was equally good.

15. On the Skerry rocks, east of the Start, a buoy might be of use in hazy weather, when land marks are not visible.
16. I like the same coloured buoys to be on the starboard hand of all harbours going in, be it red or black, and on the north of open channels, it would be of great use to strangers.
17. No difference in colour. A large cone.
18. No.
21. I think the two lights of the Sevenstones require some alteration; see No. 6.
30. No.
34. "Wizard," Royal Yacht Squadron. Cutter; 95 tons (O.M.), Portsmouth.
35. WILLIAM DELAFIELD, 40, Lowndes Square.
36. 26th March 1860.

809.

1. Ireland, from Cape Clear to Loch Strangford. England, from Land's End to Portsmouth, especially about Cowes and Cork Harbour.
2. The vicinity of Cherbourg and the channel islands, and a partial knowledge of most of the Mediterranean and coast of Portugal.
3. Yes, generally.
4. The French have more lights, but I am not sufficiently acquainted to say their system is better.
6. No.
7. I have seen Ballycotton island light farther than any other.
8. I have felt the want of a lighthouse on the west end of Guernsey.
9. I think there is room for improvement.
13. A better system is wanting.
14. Yes.
15. I have felt the want of buoys in the shoals off the east coast of Ireland.
16. I think the want of an uniform system causes difficulty in most of the channels and harbours of the kingdom.
17. I cannot say which is best. I think white worst.
19. I think lighthouses ought to be as easily identified by day as by night. Perhaps this could be attained by painting them the colour of the light they show. If the light revolves, broad bands round the building could indicate the number of revolutions in a minute. If it flashes the stripes might be made vertical.
23. I think the Skerries off the Start, and Peveril ledge off Swanage, and the north shore of the Solent want buoys, and the banks off the east coast of Ireland, but I have not been in the latter locality for three or four years, so perhaps the want may have been supplied. I think a lighthouse wanting on or near the west end of Guernsey, perhaps on the Hanois rocks.
28. I think some uniform system of buoyage quite necessary. I think the buoys which mark isolated shoals should be different in form from those which mark banks connected with the shore, and the colour of the latter should always indicate on which hand they should be left.
33. I have been yatching for 20 years.
34. "Eugenie," R. Y. S., 92 tons. Southampton.
35. RICHARD FRANKLAND, Queenstown, Ireland.
36. 2nd April 1860.

810.

Greenhill, East Barnet, Herts.
March 31st 1860.

To the Commissioners appointed by Her Majesty to inquire into the Condition and Management of Lights, Buoys, and Beacons.

GENTLEMEN,

In reply to your circular addressed to me, I presume as the owner of the R. Y. S. Schooner "Magic," I considered it most advantageous to your object to refer it to my sailing master, Robert Tracey, who is simply a practical seaman of most respectable character, living at Brightlingsea, near Colchester.

The answers appended to your queries are to be taken as coming from him.

So far as my own limited experience goes, which is confined to short nights, fine weather, and the more accessible harbours frequented by yachts, I can bear general testimony to the sufficiency of the means to the end, but I

may be permitted to remark as creditable to the vigilance of the men in charge, that upon one occasion in August last, when we had come out of Harwich with a northerly wind, and had rounded the lightship for the North Foreland, they considered we were hugging the bank too close, and fired a gun to warn us against the possible danger.

I am, &c.

SAML. R. BLOCK.

811.

1. Generally acquainted with the coasts of England, France, and Holland.
2. From the Channel islands eastward to the Texel.
3. Consider the British coast well lighted.
4. Generally, yes.
6. In many instances as master of a Jersey coasting vessel. In laying too in gales of wind I have felt the want of a light on the Hanois off the west point of Guernsey, and such a light would be a boon to vessels coming in from sea to Channel.
10. The fog signals are very good if properly understood and attended to.
15. In 1854 I went into Salcombe harbour, and although it was stated on the chart and book that it was well buoyed and beacons there were none there, and it was said there had been none for some time past. They would be desirable, as it is a safe harbour inside.
33. Thirty-five years.
34. Royal Yacht Squadron. Schooner "Magic," 87 tons (O.M.), Portsmouth.
35. ROBERT TRACEY, Brightlingsea, near Colchester.
36. P. SAM. RD. BLOCK, Greenhill, East Barnet, Herts.

812.

1. Yes, with the British and St. George's channels.
2. The coast of France, north coast of Spain, Portugal, and the Mediterranean.
3. The coasts I mention are well lighted.
4. The coast of the United Kingdom is as well lighted as any I know.
6. I never knew a floating light to be off her station, or go out, or any irregularity in the light of a lighthouse.
7. Catta, in the Gulf of Lyons, and Gosa, near Malta. I think Gosa to be visible at the greatest distance.
8. I never felt the want of lightships or a lighthouse in either of the two channels.
9. It happens sometimes that a ship light is taken for a floating light when the ship is much nearer to you than the lightship.
10. Yes.
11. Yes.
12. None whatever.
13. Yes.
14. I think the coasts of the United Kingdom much better supplied than any other coasts I know.
15. None whatever.
16. I am not aware of any difficulty.
17. A black nun buoy.
18. Never had an occasion.
23. A floating light would be very useful if placed on the ridge in the straits of Dover. Many vessels no doubt have been lost on this shoal.
24. I think the lights are discernible and distinguishable from one another.
27. I think a powerful bell, such as they have at Kingstown Pier Head.
29. Flags by day and lights by night, such as they use at Shoreham.
33. Thirty years.
34. Mr. Morgan's Yacht "Minstrel," 75 tons. Portsmouth, R. Y. S.
35. DAVID TROUT, 66, Upper King Street, Southsea, Hants.

813.

1. Yes; I know the English Channel well, from the Downs to the Land's End—every harbour in it.
2. Also acquainted with east coast of Ireland and west of Scotland. I know many parts of foreign coast, but not sufficiently to suggest any alteration or improvement.

3. Some parts of it.
4. Yes.
5. The French lights are best.
6. No.
8. I would suggest a light ship be placed on the Ridge, a dangerous shoal about 13 miles S.E. of Dungeness. The float should exhibit two lights, one red, the other bright. I have also felt the want of a lighthouse on the N.W. part of Guernsey.
9. I think generally they cannot be mistaken.
10. Yes.
11. No.
12. No.
13. Yes.
14. Yes.
15. No.
16. No.
17. Black.
18. Never.
19. No.
20. Not above 300 feet.
21. No.
22. The Mull of Cantire Light is not in the most favourable position to be seen coming from the southward. It should stand further down on the point to the southward, and it would be as readily seen coming from the north.
23. I would strongly recommend a lighthouse should be built at once on that dangerous rock Skervail, in the Sound of Jura (Scotland), instead of the present beacon.
24. I have found the red light at the N.E. entrance of the Menai Straits (Penmon Point) a very dull bad light.
27. I do not know anything better than a large bell or gong.
30. No.
33. Twenty-eight years.
34. Have commanded several vessels from 70 to 210 tons; now in command of a yacht 117 tons.
35. WILLIAM WILLS, 8, York Terrace, Newtown, Gosport.

814.

9. In clear weather, yes; but to make them properly so a rocket should be fired every hour at night, and a gun in thick weather during the day, using the usual fog signals between the hours. The rocket for this reason, it may be very thick over the lightvessel if near a bank, but may be clear in deeper water, and the rocket may be seen from the vessel above the fog.
19. When the light is a fixed light, to have a lower light only to be seen within a certain distance. And when the light is revolving, to have a portion of the light always visible only within a certain distance, as at times it is impossible to estimate distances accurately at night.
20. Lundy Island lights are very high, but not too high for the purpose; but in channels, if there are no outlying dangers, I think 200 feet should not be exceeded.
21. I think lighthouses, the Tuskar for instance, should be striped black and white horizontally, for I have been very near it and could not make it out on account of its uniform appearance; with the sun shining looking like a sail, and with a clouded sun could not see it on account of its not having anything to distinguish it from the sky in the background, horizontally, for if both stripes were of an uniform breadth the distance may be estimated accurately. Floating lightvessels also should be painted white and black perpendicularly or horizontally from the gunwale to the water's edge if there are two within a short distance of each other, and chequered if there should be only one. As regards

buoys, it should be an universal system of having, on entering a roadstead or harbour, those on the port hand red, and on the starboard hand black, and any danger in the channel to be marked with a chequered black and white buoy.

23. Blackwater Bank, Coningsbeg Rock.
24. I do; it is true that a brilliant or white light will appear somewhat darker in a fog, but the fog is always perceptible, and must be taken into consideration, and it is my opinion that the colour of the lights on the coasts of the United Kingdom could not be more judiciously placed.
25. While we have brilliant and red lights for the different lighthouses, I should say white lights in all cases for lightvessels, with the present mode of lighting large sailing vessels.
28. When a coast requires a buoy, it should be a bell beacon buoy; for the rest answered in 21.
29. The semaphore, to be understood by the most simple person, see the accompanying idea.*

For the day, and placed where best seen from the offing or entrance to the harbour, commencing at low water, and having nothing but the bare mast visible. At the commencing of the flood tide hoist the red flag at the mast head, and for every foot of rise in the tide use the numeral flags of Marriott's code of signals until the first quarter, then place the arm of the semaphore at the point where it is marked first quarter flood; commence again with the signals at (*), and so on, till half flood, begin again; at high water haul down the red flag and hoist a black ball; at the commencement of the ebb, haul down the ball and hoist the blue pendant (I think would be best, for then, if the colour was not distinguishable, the form of the flag would), and mark the fall of tide by the numerals, as (—), till first quarter ebb; begin again from that point, and so on till low water or as long as daylight lasts.

For the night, the same machinery will answer, using three lights, the centre (and upper lights between half ebb and half flood) to be always white and stationary. Commence at low water, the red light being the lower and the green the upper light; at the first quarter flood, the green comes down and is the lower light, and the red light will be where it is shown as first quarter flood, and so on till high water, when the red becomes the upper light and the green the lower light, still, at quarter ebb the red light comes down, and is the lower light, and the green goes up to where it is marked first quarter ebb, and so on till low water or until daylight. No one could mistake them, as the green light being beneath the white light and the red light at an angle with them, will show the flood; and the red light being beneath the white light and the green light at an angle with them, will show the ebb; at high water, red above and green below, and the contrary.

For a lightvessel, the same light at night may be used, and in the day a black ball may be used instead of the light, using the red flag for flood and blue pendant for ebb, and Marriott's numerals, as on shore, at one yardarm, or simply the red square flag at the mast head to denote the flood has commenced, and use the numerals, say No. 1 for first quarter, 2 for second, &c.; at high water a black ball; then, as soon as the ebb commences, down with the black ball and hoist the blue pennon, and hoist No. 4 numeral, as being first quarter ebb, always minding to on the flood hoist the flag after the quarter is full, and the ebb before it is down to the quarter.

33. Twenty-two years.
34. Ship "Champion of the Seas," 1,946 tons, of Liverpool.
35. JAMES M. OUBRIDGE, Ship Master, 40, Everton Valley, Liverpool.

* Drawing omitted.

Form circulated amongst Mariners, &c., with an Abstract of the Evidence of 793 Witnesses, comprising 14,791 Answers written on the Forms returned.

CIRCULAR NO. VIII.

ROYAL COMMISSION ON LIGHT-HOUSES, &c.

THE COMMISSIONERS APPOINTED BY THE QUEEN TO INQUIRE INTO THE CONDITION AND MANAGEMENT OF LIGHTS, BUOYS, AND BEACONS,—NAMELY,—WILLIAM ALEXANDER BAILLIE HAMILTON, Esq., Rear-Admiral, R.N., ALFRED PHILLIPPS RYDER, Esq., Captain, R.N., JOHN HALL GLADSTONE, Esq., DUNCAN DUNBAR, Esq., CHAIRMAN OF THE LONDON LOCAL MARINE BOARD, AND SAMUEL ROBERT GRAVES, Esq., CHAIRMAN OF THE LIVERPOOL LOCAL MARINE BOARD; BY VIRTUE OF THE AUTHORITY VESTED IN THEM BY ROYAL WARRANT TO QUESTION THOSE WHOM THEY MAY DEEM MOST COMPETENT TO AFFORD THEM CORRECT INFORMATION ON THE SUBJECT OF THEIR INQUIRY, request that you will write an answer opposite to each of the following Questions, and that you will return this Paper through the Post Office (unpaid).

J. F. CAMPBELL, Secretary.
1859.

7, MILLBANK STREET,

QUESTIONS.	TOTALS.	ABSTRACT OF ANSWERS.
1. Are you well acquainted with any particular parts of the coast of the United Kingdom or the Colonies?—if so, name them.	793 Answers	See Index for the coasts named.
2. Are you well acquainted with any foreign coasts?—if so, name them, or those parts of them with which you are well acquainted.	456 Answers 337 Blanks	See Index for the foreign coasts named, which include most of the sea coasts in the world.
3. Do you think that the coasts of the United Kingdom, or the part or parts of them which you have named above, are well lighted?	715 Answers 78 Blanks	564 Direct affirmatives. 110 Qualified affirmatives, suggesting improvements. 7 Qualified negatives, mentioning local defects. 17 Direct negatives. 3 Doubtful. 14 No answer to this question.
4. Do you think that the coasts of the United Kingdom are as well lighted as any of the foreign coasts which you have already named?	586 Answers 207 Blanks	514 Direct affirmatives. 18 Doubtful affirmatives } - <i>Naming</i> 8 Doubtful negatives } - French - - 14 8 Direct negatives. } - Gulf of Finland 4 United States 3 Danish - 1 38 No answer to this question.
5. If you think that the coasts of the United Kingdom are not so well lighted as those of any other country or countries, name those countries in the order in which you prefer their lights.	311 Answers 482 Blanks	200 Prefer England. 33 Name countries preferred } - France - 25 18 Name countries equal } - Spain - 1 45 No opinion. } - Russia - 3 15 No answer to this question. } - Sweden - 1 Belgium - 1 America - 3 Italy - 1
6. Have you ever noticed any derangement or irregularity in the light of a lighthouse, or floating light; or have you ever known it to go out; or have you ever known a floating light to be off her station?—if so, state when and where.	655 Answers 138 Blanks	477 Have <i>not</i> in either. 111 Have,—either in lighthouse or lightship. 38 Have,—in lighthouses and lightships. 23 Doubtful. 6 No answer to this question.
7. What British and what foreign light have you usually seen furthest off, and which of the two has been usually visible at the greatest distance?	655 Answers 157 Blanks	312 Name British and foreign lights seen far off. 149 The British light usually seen farthest off. 74 The foreign light usually seen farthest off. 69 British and foreign lights as equal. 51 Have no opinion. 20 Are double answers.
8. Have you ever felt a want of Lighthouses or floating lights on any part of the coast or in any of the channels of the United Kingdom?—if so, where?	645 Answers 148 Blanks	297 Have felt the want, and say so. 31 Have noticed defect, but now remedied. 305 Have not felt the want, and say so. 5 Doubtful. 7 No answer to this question.
9. Do you think that the floating lights generally in the United Kingdom are sufficiently brilliant or distinct in character to prevent them from being mistaken for ship's lights or shore lights?	658 Answers 135 Blanks	488 Direct affirmatives. 102 Qualified affirmatives suggesting improvements. 21 Qualified negatives suggesting improvements. 22 Direct negatives. 22 Doubtful. 3 No answer to this question.

	TOTALS.	ABSTRACT OF ANSWERS.																												
10. Do you think that the fog signals now used in lighthouses and floating lights in the United Kingdom are efficient.	639 Answers 154 Blanks	352 Direct affirmatives. 78 Qualified affirmatives suggesting improvements. 37 Qualified negatives suggesting improvements. 94 Direct negatives 34 Doubtful. 44 No answer to this question.																												
11. Do you think that fog signals are used with sufficient frequency in lighthouses and floating lights in the United Kingdom?	604 Answers 189 Blanks	327 Direct affirmatives. 82 Direct negatives. 129 No opinion, or no experience. 66 Suggest improvements.																												
12. Have you experienced inconvenience from a want of tide signals in lighthouses and floating lights—or from their inefficiency—or from a want of uniform system?—if so, state where.	588 Answers 205 Blanks	515 Have not experienced any inconvenience. 50 Have and suggest improvements. 23 Have had no experience, or have no opinion.																												
13. Do you think that the coasts of the United Kingdom are well supplied with buoys and beacons?	668 Answers 125 Blanks	545 Affirmatives, direct and general. 83 Qualified affirmatives, with particular exceptions. 12 Qualified negatives referring to local defects. 15 Direct negatives. 13 No answer to this question.																												
14. Do you think that the coasts of the United Kingdom are as well supplied with buoys and beacons as those foreign coasts which you have already named at Question 2. If you do not, name the country best supplied.	488 Answers 305 Blanks	442 Direct affirmatives. 6 Qualified affirmatives suggesting improvements. 5 Foreign countries as well supplied. 8 Foreign countries better supplied. 27 Have no opinion.																												
15. Have you ever felt the want of buoys or beacons on any part of the coast of the United Kingdom?—and if so, where?	647 Answers 146 Blanks	456 Have never felt the want of buoys and beacons. 12 Have felt the want, but now remedied. 174 Have experienced the want, and state where. 3 Have no opinion. 2 No answer to this question.																												
16. Are you aware of the existence of difficulty in navigating any particular channels, harbours, &c., owing to the system of buoying there used, or the absence of system?—if so, name them, and the defect in each case.	563 Answers 230 Blanks	472 Are not aware of any difficulty. 14 Complain of want of system. 15 Suggest a general system. 52 Mention local defects. 10 Not an answer to this question.																												
17. What is the shape and colour of the buoys which you can see best at night?	Shape: 405 Answers 388 Blanks Colour: 698 Answers 95 Blanks	333 Have formed an opinion as to shape. 72 Have not. 657 Have formed an opinion as to colour. 41 Have not.	<table border="1"> <thead> <tr> <th>SHAPES PREFERRED</th> <th>COLOUR.</th> <th></th> </tr> </thead> <tbody> <tr> <td>Cone 95</td> <td>Black</td> <td>408</td> </tr> <tr> <td>Can 62</td> <td>Dark</td> <td>94</td> </tr> <tr> <td>Nun 123</td> <td>Red</td> <td>29</td> </tr> <tr> <td>Spiral 25</td> <td>Chequered</td> <td>13</td> </tr> <tr> <td>Round 12</td> <td>Red & white</td> <td>7</td> </tr> <tr> <td>Other shapes 16</td> <td>White</td> <td>62</td> </tr> <tr> <td></td> <td>Not classed</td> <td>44</td> </tr> <tr> <td></td> <td></td> <td>657</td> </tr> </tbody> </table>	SHAPES PREFERRED	COLOUR.		Cone 95	Black	408	Can 62	Dark	94	Nun 123	Red	29	Spiral 25	Chequered	13	Round 12	Red & white	7	Other shapes 16	White	62		Not classed	44			657
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18. If you have ever had occasion to make a claim for the return of light dues erroneously charged, state how often, and the result.	513 Answers 280 Blanks	493 Have not had. 14 Have. 6 No answer to this question.																												

Be so good as to attend to the directions for signing, &c. at numbers 33, 34, 35, 36.

SPECIAL QUESTIONS.

Any of the following questions remaining unanswered to be crossed with the Pen.

19. Has it ever occurred to you that any particular system of lighting, different from that at present employed, would have facilitated navigation?—if so, describe the system that would, in your opinion, be an improvement.	343 Answers 450 Blanks	249 Have no suggestions to make. 82 Make suggestions or desire alterations. 12 No answers, or no opinion.																				
20. If you have formed any opinion as to the extreme height above the level of the sea which should not be exceeded in placing the light of a lighthouse on the coasts of the United Kingdom, mention the height.	335 Answers 458 Blanks	128 Have not formed an opinion, or indefinite reply. 203 Have formed an opinion and state height— 4 No answer to this question.																				
		<table border="1"> <thead> <tr> <th>Feet.</th> <th>No.</th> <th>Feet.</th> <th>No.</th> </tr> </thead> <tbody> <tr> <td>50</td> <td>5</td> <td>250</td> <td>16</td> </tr> <tr> <td>100</td> <td>24</td> <td>300</td> <td>17</td> </tr> <tr> <td>150</td> <td>19</td> <td>400</td> <td>6</td> </tr> <tr> <td>200</td> <td>45</td> <td>500</td> <td>4</td> </tr> </tbody> </table>	Feet.	No.	Feet.	No.	50	5	250	16	100	24	300	17	150	19	400	6	200	45	500	4
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50	5	250	16																			
100	24	300	17																			
150	19	400	6																			
200	45	500	4																			
21. Can you suggest any improvement in the position, height, nature, colour, or means of identification of any lighthouses, floating lights, buoys or beacons in the United Kingdom? If so, suggest the improvement, and give your reasons.	375 Answers 418 Blanks	193 Are satisfied, and make no suggestions. 171 Suggest alterations as improvements. 11 No opinion, or no answer to this question.																				
22. Would you suggest the entire removal or a change in the position of any lighthouse, floating light, buoy or beacon?—If so, name it, and state why you think it should be moved.	331 Answers 462 Blanks	210 Make no suggestions or are satisfied. 109 Make suggestions for removal or change. 7 No opinion. 5 No answer to question.																				

	TOTALS.	ABSTRACT OF ANSWERS.												
23. Would you suggest the placing of a new lighthouse, floating light, buoy, or beacon on any part of the coasts of the United Kingdom?—if so, state where it should be placed, and why.	466 Answers 327 Blanks	130 Make no suggestions or say they are satisfied. 331 Make suggestions for placing new lighthouses. 5 No opinion, or no answer to question.												
24. If you are in the habit of passing lighthouses with coloured lights, do you consider that they are discernible at a sufficient distance, and that such lights are sufficiently distinguishable from one another, and from white lights, in all weathers.	509 Answers 234 Blanks	391 Are generally satisfied with colored lights. 84 Generally satisfied, but mention defects. 15 Are not satisfied with colored lights. 19 Have no opinion or no experience.												
25. If you have formed any opinion as to the comparative merits of each description of coloured light (red, green, blue, &c.), as regards their application to lighthouses and floating lights, state it.	416 Answers 377 Blanks	303 Have formed an opinion favorable to - - - - - 113 Have no opinion.												
		<table border="0"> <tr><td>red - - -</td><td>215</td></tr> <tr><td>green - -</td><td>12</td></tr> <tr><td>blue - - -</td><td>5</td></tr> <tr><td>red and green</td><td>12</td></tr> <tr><td>white - - -</td><td>29</td></tr> <tr><td>red and white</td><td>30</td></tr> </table>	red - - -	215	green - -	12	blue - - -	5	red and green	12	white - - -	29	red and white	30
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26. If you are acquainted with any system of colouring lighthouses or lightships by which they are easily seen and readily identified, describe the system.	352 Answers 441 Blanks	145 Are satisfied with present system. 90 Are not satisfied and make suggestions. 117 Have no opinion, or give no answer to question.												
27. What system of fog signals applicable to lighthouses and floating lights in use in this or foreign countries do you think best?—Describe it.	384 Answers 409 Blanks	51 Have an opinion, and prefer "the present system." 30 Have no opinion.												
		<table border="0"> <tr><td>Gongs - - -</td><td>117</td></tr> <tr><td>Gongs and bells</td><td>50</td></tr> <tr><td>Bells as used -</td><td>38</td></tr> <tr><td>Whistles - - -</td><td>10</td></tr> <tr><td>Guns - - - - -</td><td>88</td></tr> </table>	Gongs - - -	117	Gongs and bells	50	Bells as used -	38	Whistles - - -	10	Guns - - - - -	88		
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28. If you think that any uniform system of buoyage applied to coasts, harbours, channels, &c., would facilitate navigation, give your opinion, and describe the system.	268 Answers 525 Blanks	148 Are in favour of any uniform system. 86 In favour of present arrangements. 34 Have no opinion.												
29. What system or description of tide signals applicable to lighthouses and floating lights do you think best, and if you are able, give the code for day and night.	202 Answers 591 Blanks	65 Are satisfied with present arrangements. 62 Point out defects or improvements. 75 No experience or no opinion to give.												
30. Have you ever made any representations or proposals regarding the lights, buoys, or beacons of the coasts of the United Kingdom?—if so, state to whom—the subject—and the result.	373 Answers 420 Blanks	62 Have made representation - - - - - 311 Have not made any.												
		<table border="0"> <tr><td>successfully - -</td><td>23</td></tr> <tr><td>unsuccessfully -</td><td>8</td></tr> <tr><td>uncertain - - -</td><td>2</td></tr> <tr><td>no reply, result not stated, or in abeyance - - - - -</td><td>24</td></tr> <tr><td></td><td>62</td></tr> </table>	successfully - -	23	unsuccessfully -	8	uncertain - - -	2	no reply, result not stated, or in abeyance - - - - -	24		62		
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	62													
31. If you are practically acquainted with any lighthouse or floating light, the light of which has been changed from the catoptric (indicated in the official lists by C.), to the dioptric principle (indicated by D.); and if you have formed any decided opinion as to the superiority of either principle, state it.	221 Answers 572 Blanks	36 Are practically acquainted with lights } C. 3 changed, and preferred - - - - - } D. 33 178 Are not acquainted, or give no opinion. 7 No answer to this question.												
32. If from your general experience you have formed a decided opinion as to the comparative merits of the two principles named above, state it, and your reasons.	163 Answers 630 Blanks	23 Have formed a decided opinion and give reasons, prefer - - - - - 127 Have not formed an opinion. 9 Name places where lights are excellent. 4 No answer to this question.												
		<table border="0"> <tr><td>C. - - - - -</td><td>2</td></tr> <tr><td>D. - - - - -</td><td>19</td></tr> <tr><td>Cata. D. - - -</td><td>1</td></tr> <tr><td>C. afloat, D. ashore</td><td>1</td></tr> </table>	C. - - - - -	2	D. - - - - -	19	Cata. D. - - -	1	C. afloat, D. ashore	1				
C. - - - - -	2													
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C. afloat, D. ashore	1													
33. If you have served at sea, state for how long.		See Index. } P. 145 Pilots.												
34. If you command a vessel, give her name and tonnage, and port of register, and if a steamer, her horse power.		See Index. } M. 511 Master Mariners.												
35. Be so good as to sign your name, stating your present occupation, and giving an address.		See Index. } F.M. 40 Foreign Masters.												
		See Index. } S. 10 Surveying Officers.												
		See Index. } Y. 8 Yachtsmen.												
		See Index. } E. 1 Elder Brother, Trinity House.												
		See Index. } RN. 1 Admiral RN.												
		See Index. } RN. 61 Officers do.												
		See Index. } CE. 1 Civil Engineer.												
		See Index. } 15 Other occupations, professions, &c.												
		Total - 793												
36. Date and fold the paper and send it (unpaid) to the nearest post office.														

Note.—In March 1860, after these answers had all been received, printed, and abstracted, a number of forms which were sent to the Secretaries of the Yacht Clubs in April 1859 were received by some members, and were then filled up and sent. They are printed separately and are not included in this abstract.—(See Appendix to Mariners' Evidence, p. 579 to 585, ante.)

ANSWERS TO SCIENTIFIC QUESTIONS.

I.

Dr. ROBINSON.

I. THOMAS ROMNEY ROBINSON, D.D., Observatory, Armagh.

II. In general, I consider oil the best: in particular cases, its intensity may be much increased by mixing a portion of oxygen with the air which supplies the Argand burner. If gas be used, its brilliancy is increased by saturating it with the vapour of naphtha, or better of benzole. Lime light is nearly as troublesome and precarious as the electric, but has only $\frac{1}{100}$ of its intensity. I conceive these intense lights should only be used in case of fog or snow. In ordinary cases, a first class Fresnel light is visible at any distance within view of a vessel's masthead. I have been told that the Skerryvore light has been seen from Ben Nevis, about 90 miles. In 1851 I found a dioptric light on Pentland Skerries ten times as intense as the catoptric on Dunnet Head.

III. Except in the case of fog, I think oil the best. Then, as an auxiliary, the magneto-electric light may be used, but its regulator should be, like that of Mr. Serin, able to rekindle the light when interrupted. For flashes, the electric light is less objectionable than for continuous exhibition.

IV. Certainly, Stevenson's holophotal combination; a parabolic mirror, with a Fresnel's lens in front to catch the rays which would escape the mirror. Especially, if instead of a triple or quadruple concentric lamp, a smaller flame of more intensity were used.

V. I know of none better than Fresnel's cylindrical arrangement with oil. If the electric light be used, as its small size will not allow sufficient divergence, the lenses must be specially figured.

VI. For floating lights, I suppose the simplest arrangements are the best.

VII. a. The present process is a very rude one, and gives an untrue surface. Perhaps, if a mould were figured carefully, accurate specula could be formed on it by electroplating.

b. I have no suggestion on this, except that the transparency of the glass should be measured before it is wrought into lenses or prisms, and its power of resisting sea air; some kinds become rapidly tarnished.

VIII. None that are available for this purpose.

IX. a. I wish to suggest that it is important to ascertain the character of the light transmitted by coloured glasses, for the spectra are very different when the eye sees nearly the same tint; and the absorption by the atmosphere may also be different.

b. As few as possible pieces of glass should be interposed between the light and air; light is lost at every surface by reflection, and absorbed by every inch of thickness. Three inches of the best flint glass will intercept 0.19 of this incident light.

X. a. Undoubtedly red; according to my experience, no other colour can be perceived a few miles off; what red medium is best, remains to be determined.

b. I would prefer white; the fog will absorb useless rays; any colouring medium will abstract some of the useful.

XI. a. If stars are visible, the distance between one near the zenith and the light, taken with the sextant and the time, will give the light's altitude. I know none other available in a sea way, unless Professor Smyth's revolving stand comes into use.

b. If the intensities of the light be known, and the distance run, the distances at the time of the two observations are easily found; the intensities could be measured by a simple photometer, a wedge of dark glass slid before a slit, through which you look till the light disappears.

XII. a. I should prefer trussed structures of iron, left open to give passage to the waves; painted, not galvanized; and where there is a prevailing set of sea, strongest in that direction.

XIV. Generally speaking, I should prefer a vessel long, sharp forward, and with wave lines, but as flat in the floor as possible amidships, in reference to sea.

A circular vessel would, I think, pitch excessively, but the principle of mooring, so that the strain on the moorings should pass as near the centre of gravity as possible, seems good.

XVI. c. Near a harbour, buoys might be provided with reflectors of silvered glass, portions of cylinders on which a strong beam of parallel rays might be thrown from shore. With electric light, I am disposed to think this could be done several miles off.

XVIII. I believe fog acts merely as a general damper of sound, and therefore do not think any peculiar pitch preferable.

XIX. A whistle; its pitch to be as discordant as possible from that of the sounds made by the wind and sea. These are said to be generally belonging to C. The flash of a gun would be visible at some distance, but how far is not known.

XX. A large speaking trumpet intensifies the sound, but confines it to a limited divergence; it has been tried with guns, and would undoubtedly act well with a steam whistle. But it could only be of use on a single line of approach.

XXI. As near the sea level as possible.

XXII. Judging from my limited experience, I should say not less than 100 feet nor more than 500.

XXIII. Mr. Wheatstone has recently invented a form of telegraph which can easily be worked and read by the keepers. The information most desirable is, the direction, force, and place of a gale, as also whether its strength is spreading north or south, &c. These could be shown by the flags of Marryat's signals, and fresh signals shown as each despatch was read.

XXIV. The announcement by the same code of signals of the actual depth of water for each half hour. Any person who cannot read such signals ought not to command a vessel.

CIRCULAR No. II.

I. So much so, that till I read this question, I never contemplated the possibility of such apparatus being constructed without these data.

II. Decidedly so; the height of the station may exercise an important influence on the figure, not only of the reflecting prisms, but even of the lenses. At 200 feet height, the dip of the horizon is 14 minutes, which could not be neglected. The horizontal are is intimately connected with the intensity of the light, assuming that some holophotal arrangement is used.

III. Such tables must be of double entry, with height and refractive index as arguments. They could be made; but I think it would be far better for light-house authorities to employ some competent mathematician to compute in each instance. The pieces of glass should be first cast, and the indices determined.

IV. I do not know; the only place where I have seen such computations, is in Alan Stevenson's work on Skerryvore.

Feb. 22, 1860.

2.

I. JAMES P. JOULE, LL.D., F.R.S.

II. I do not. I think gas apparatus much more liable to accidental derangement. I have strong objections to the use of the electric light, for, whether obtained by the use of a voltaic battery or a magneto-electric machine, it is liable to derangement, and the intensity of illumination varies perpetually and to a considerable amount. The oxy-hydrogen lime light is, I believe, less objectionable on these grounds than the electric; but I could not recommend it in preference to oil.

III. Paraffin oil might be used in lighthouses easy of access. But as it is almost as combustible as camphine,

Dr. JOULE.

I do not think it would be safe to use it in lighthouses in remote positions.

XI. Two lights might be employed, as suggested by Mr. Fryer. The one being placed at a certain known elevation above the other, the mariner could readily find the distance by the use of a sextant or other means for ascertaining the angle subtended by the lights.

XIV. I think Mr. A. Fryer's suggestion is a good one.

"A paper was read by Mr. Alfred Fryer, entitled 'Suggestions for a new form of floating lighthouse, and a mode of estimating the distances of lighthouses.'

"Authorities agree that ordinary floating lights are uncertain, being liable to be drifted from their moorings; they are also frequently injured by storms, and are expensive to maintain.

"As the violent action of wind and waves on a considerable surface is the chief cause of mischief, it is proposed to construct a vessel presenting little surface exposed to their influence. The form proposed somewhat resembles a hydrometer, and the material used is wrought iron, the 'stem' being surmounted by the light-room and lantern, and the 'bulb' containing the dwelling apartments and store-room. The form of the stem is slightly taper, and at its union with the light-room is only of sufficient width to admit a ladder and the body of a man easily. The length, shape, and strength would vary within certain limits by local considerations. The vessel represented in the diagram and model was one hundred and twenty-five feet long, two-thirds being exposed and one-third submerged. A wide flange, the office of which was to retard and reduce oscillation and vertical motion, was attached to the widest part of the 'bulb.' The discomfort of living twenty feet below the surface of the water was shown to be small. Some little light could be reflected down the 'stem,' while quiescence when the water was violently agitated by storms, immunity from the dangers of fire and lightning, and little or no chance of shipwreck or being drifted from the moorings, are advantages not to be forgotten. Ample ventilation could be secured by dividing the stem into ventilating shafts.

"Moderate cost, steadiness during storms, and the great elevation at which the light is exhibited, are the chief advantages.

"It is proposed to construct lighthouses, in all cases where it is important that mariners should estimate their distance, as double lights. The lower light should be exposed in the same tower at a given distance, say fifty feet, and by measuring the apparent distance of the lights apart, either approximately with the eye or accurately with a sextant, the distance can be at once determined.

"If Mr. Herbert's proposition for mooring a series of floating lights along the English and other Channels should be adopted, it is proposed to unite them with each other and with the shore by means of a submerged cable and electric telegraph, so that important information either respecting the lighthouses or vessels in distress can be communicated to head quarters without delay.

"Models of the ordinary form and proposed new form of lightships were exhibited, and on the surface of the water being agitated the motion of the former was considerable, while that of the latter was very slight."—*Proceedings, Lit. & Phil. Society, Manchester, No. 8.—Session 1859-60.*

XIX. A distinction of sounds should be made so as to indicate the objects whence they proceed. Thus the steam whistle for steamers, bells for sailing ships, gongs for light ships, and cannon for lighthouses.

XXII. Generally about 20 yards above high-water mark, but it would be desirable to determine the best elevation in each instance by meteorological observations made for the purpose.

3.

I. Rev. THOMAS PELHAM DALE, M.A., F.R.A.S., 14, Torrington Square, W.C.

VIII. A red light can be *extemporized* by covering an ordinary lantern with good red hanting.

X. a. I would venture to suggest that inquiries should be made as to the existence of colour blindness as a cause of the mistake of red lights. Many artists declare their inability to trace the lower tones of red.

XI. By making the bar, alluded to in XXIV., a given length (its azimuth supposed known), or if the ball were of known diameter, the angular measure by a sextant would give the distance to the centre

Rev. T. P. DALE.

of the bar or ball; or if sound and light signals were made simultaneously, the difference between the interval when the light was seen and the sound heard, would give this distance roughly.

XVIII. I would suggest a trial of the *drum*, as distinctive at a considerable distance.

XXIV. and XXV. Identification of lighthouses:—
(1). (b.) At night.

I propose that lighthouses be distinguished by combinations of rapid extinctions of the light, which I will call flashes, and slower extinctions, which I will call eclipses.

I propose the following plan for identifying the different combinations required. Adopt the Roman system of numerals, and let the flash represent the V, and the eclipse the I, of those numerals.

Then No. I. is represented by one eclipse.

No. II. by two.

No. III. by three.

No. IV. by one eclipse and one flash.

No. V. by one flash.

No. VI., &c., by one flash, one eclipse, &c.

No. IX. by one eclipse and two flashes.

No. X. by two flashes.

I have found this plan so simple that two persons of intelligence could signal with considerable readiness after an hour's practice.

The application of this plan to fixed lights I propose as follows:—

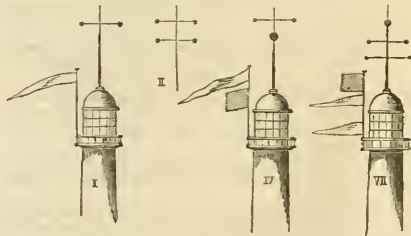
The light remains steady for a certain number of minutes, and then proceeds to make the combination of flashes and eclipses which represents its number, then remains steady again, and so on all night.

I assume that the ten distinctive numbers would be enough, though in case of need a light might make two in succession. A distinction would also be possible by means of the interval of the flashes, as one minute, two minute lights, &c.

The number of the light should be noted on the chart. Thus, suppose the South Foreland light were No. (6.), and the interval were two minutes, it would be denoted on the chart by "2 mi. (6)," and would be known by making a flash and an eclipse at an interval of two minutes. Of course the change to red might be substituted for a flash, but the objection to coloured lights appears to be that noted in my answer.

The same principle could be adopted in tidal lights; in that case the number made might be the number of feet, yards, or fathoms of water over the bar.

(a.) To identify lights by day.—Let the white flag or pendant represent I., the red flag the V. of the Roman numerals, or the bar the I. and the ball the V., and in this case the lighthouse could with four flags always display its number.



Identification by sound.—I propose to represent numbers by sound, thus:—

I represents I. V represents V.

(This is fully explained in *Marryat's Signals*, ed. 1856.)

Hence No. (4) would be represented in musical notation by

By means of a simple apparatus, a subsidiary light might on the same principle be used as a signal light. The electric light, should it in other

Rev. T. P. DALE.

respects be found suitable, would be very convenient; and by means of a code, meteorological information might be communicated to a considerable extent. A sound apparatus might be used with or without the light apparatus at pleasure. The apparent interval between the two would answer roughly query No. XI.

- XXV. *a.* By means of flags, &c., arranged according to the Roman numeral system.
b. By means of flashes and sounds arranged in the same way. See detailed account above.

4.

- I. C. PIAZZI SMYTH, Astronomer Royal for Scotland.
 II. No. There are a few situations where peculiar facilities exist for burning gas, and that will be cheaper and more easily tended than oil, as long as everything goes right; but if something goes wrong, the immediate rectification may not be within the power of the light-keeper, in the same complete manner that is the case with an oil lamp.
 IV. Stevenson's holophotal arrangement or combination of lenses, and totally reflecting prisms; to be made of clear glass, ground and polished.
 V. Fresnel's annular lenses and annular totally reflecting prisms, made of clear glass, truly ground, and well polished.
 VI. Without modifications, beyond suiting the size of the apparatus to the size and stability of the floating vessel; remembering also, that this answer refers only to the optical arrangements, and not to the mechanical means of producing rotation, which must be employed in No. 4.
 VII. *b, c.* Alluded to already under IV. and V. All pains should be taken to choose clear transparent glass, without the too usual tendency to green or purple, when looked at edgewise; and all the means of the optician should be employed to grind and polish true surfaces. In special circumstances, *achromaticity*, by employment of two kinds of glass, may be studied with advantage.
d. The height of the centre of the light to be regulated above the centre of the lens, according to the distance at which the light is wished to be best seen and the height of the lighthouse; the adjustment once made, should never be altered.
 VIII. No.
 IX. *b.* Coloured chimney objectionable on account of the greater brittleness of coloured glass, and the difficulty of getting two chimnies of perfectly equal depth of colour, or one chimney perfectly equal all round.
 X. *a.* Read Dr. George Wilson on colour-blindness.
b. White used intermittently. The fog already reduces the intensity of the light, and if to that you add the obstruction of coloured glass, you will lose great penetrating power.
 XI. *a.* Yes.
b. Yes.
 XII. *a.* This question appears too general, for the Commissioners do not mention what lighthouse as built, or what project of a lighthouse, they regard as the most advanced model to be improved on, if possible; or what is the character of exposure to which the building is to be adapted.
 XIII. Consult Mr. Babbage, F.R.S., at whose house I have seen some very admirable plans.
 XIV. Referring only to angular motions, which I have made a subject of instrumental observation in several vessels, I would say, by all means make the breadth equal to the length, and let these be as large as possible, this being the most certain, if not the only, plan of moderating angular disturbances of the lightvessel in shallow seas.
 XVIII. A high note is generally preferable; but inasmuch as there is note-deafness, similarly with colour-blindness, no one note should be trusted to entirely. On the contrary, there should be a long varying sound, as in horn-blowing, beginning at the highest note, and ending at the lowest note, in full volume, and then terminating abruptly; next, a commencement at the low note, and gradually ending with the high one, also finishing abruptly. Guns are not heard to their full intensity, because, as with the electric spark appreciated by the eye, a certain time is required to produce full excitation of the sentient nerves; hence at the Bell-

Mr. C. PIAZZI SMITH.

rock, R. Stevenson found horns a better fog-signal than guns.

- XXIII. The first employment, as being the most certain to be trustworthy and useful, of telegraphic communication to lighthouses, should be to give time-signals to outward bound vessels. See Report to British Association, by Sir E. Belcher, R.N., in 1856.
 XXV. *b.* Consult Mr. Babbage on his excellent system; especially as the notation he employs is at once applicable, *mutatis mutandis*, to solving the preceding question, or XXV. *a.*

5.

- I. JAMES MILNE and Son, Edinburgh.
 II. In lighthouses of easy access, gas might be used with advantage.
 III. No.
 IV. Polygonal lenses ground.
 V. Catadioptric.
 VI. Yes.

CIRCULAR No. II.

- I. Manufacturers are usually bound to work to specifications, from which they cannot depart, such being the case, the information would be unnecessary. If no specification is supplied, the work could not be done without the information.
 II. It is desirable that all information should be furnished before commencing.

6.

- I. The evidence of M. FARADAY, Royal Institution, 21, Albemarle Street, W.

Royal Institution,
 February 25, 1860.

IN 1836 I was appointed "Scientific adviser to the Corporation of the Trinity House in experiments on lights." Since then a large part of my attention has been given to the lighthouses in respect of their ventilation, their lightning conductors and arrangements, the impurity and cure of waters, the provision of domestic water, the examination of optical apparatus, &c., the results of which may be seen in various reports to the Trinity House. A very large part also of my consideration has been given to the numerous propositions of all kinds which have been and are presented continually to the Corporation; few of these present any reasonable prospect of practical and useful application, and I have been obliged to use my judgment chiefly in checking imperfect and unsafe propositions, rather than in forwarding any which could be advanced to a practical result. Hence, I cannot give simple answers to the queries beneath, and therefore think it better to refer, when there is occasion for it, to my carefully considered communications to the Trinity House. The Royal Commission may not think it necessary to refer to this, or, at all events, to many of these papers; but as an illustration of my position and duty I will refer, in the first instance, to a letter of inquiries, &c. of the date 8th February, 1860, relating to Prosser's lime light.

- II. Not as yet.

Gurney oxyoil lamp.—Reports, 15th February 1837; 15th January 1838; 14th June 1838; 29th October 1838; 12th August 1839. Great exertions were made to perfect this lamp, but its application failed.

Fitz Maurice lime light.—21st July and 20th August 1858.

Prosser's lime light.—Letter and inquiries, 8th February 1860.—See the Return to Requisition at the end.

Watson's voltaic light.—Report, 15th August, 1854.

Way's mercurial electric lamp.—27th June 1859.
Holmes' magneto-electric light.—His letter, 28th April 1857; my comments, 1st May 1857; my report, 29th April 1859, and also 20th February 1860.

Pyrotechnic mixtures, and the association of steam with the lamp, have been proposed; to the reports on which I do not refer.

- III. No.

Professor FARADAY.

- IV. The best at present are the refracting and reflecting apparatus now in use.
- V. The best at present are the arrangements now in use.
- VII. *b. c.* Moulded glass, 16th January 1860.
- VIII. No.
- IX. *b.* Propositions as to reddening the light, 12th July 1837, 17th March 1843, 26th December 1845, 14th October 1859.
- X. *a.* Red from white.
- b.* White light is more serviceable and penetrating whilst white, than if reduced by the intervention of coloured media.
- XI. *a. b.* Approximations may be obtained occasionally, but they will be uncertain, because of the darkness, the unknown haziness of the atmosphere, and the refraction.
- XIII. Such improvements in ventilation, or in other points, as have occurred to me have been already introduced.
- XVI. *c.* Messrs. Brown's ignited platinum wire, 17th December 1847.
- XVIII., XIX., XX. Parabolic reflector, 16th August 1848. Whistle reflector, 24th March 1853. 22nd September 1853.
- Electro-magnetic arrangement, 6th and 16th October 1857.
- Boulogne Fog-bell and reflector, 24th October 1859.
- Start Point reflector, &c., 21st November 1859.
- XXI. Depends on the locality.
- XXII. I think each locality requires special consideration.

CIRCULAR No. 11.

- I. I presume that in Great Britain, as abroad, there is always a competent authority, who considers and decides the circumstances of every particular lighthouse, and gives instructions to the competing manufacturers. I think a manufacturer should not, on his own judgment, interfere with the judgment of such an authority. He may know the height of the lantern above the sea, but ought not to vary his angles for any variation in that respect. The variation of the angles of the glass is rarely, if ever, the kind of change required. The authorities are conscious of the need of making the beam dip, if necessary, and always have the power of directing it. In respect of the horizontal are also, the authorities always, I believe, give the number of degrees, and the manufacturer should not use his judgment in the matter.
- II. The manufacturer does not need this information to guide him in the grinding and fitting of his lenses, prisms, &c. He should receive a specification for an apparatus of well-known construction, to perform a certain well-known optical duty; and if, when it is examined, it does not perform that duty, it should be rejected.
- III. There is not the slightest occasion for a table relating to the horizontal arc. The instruction is, in any case, for a certain number of degrees, with frames, bars, &c., in certain places; and the work simply has to be done. As to elevation, the depression of the ray necessary on that account is in the power of the authorities, being ordered especially, or governed by adjustment of the lamp, and it should not be interfered with by the manufacturer.
- IV. I have no duty in this respect, but only that of examination; nevertheless, as far as I know by the results, the specification and instructions given by the authorities are sufficient for the purpose. Perfect numerical exactness in the angles cannot properly be directed or required: for the maker has, rightly, a power of improvement over his glass, and if his glass vary, the angle must vary also. The specification should tell everything that is necessary for the full information of the makers. The makers have their work subjected to a very close optical scrutiny; and it is probable that any attempt to refine further in their department might lead to the removal of responsibility from the parties who ought to bear it.

March 21, 1860.

RETURN TO REQUESTION, dated 21st March 1860, sent by desire of the Elder Brethren of the Trinity House, at the request of the Commissioners, after perusing Professor Faraday's evidence.

SIR,

Royal Institution,

February 8, 1860.

IN reply to your letter of the 1st instant, I have drawn up a set of inquiries which, in my opinion, it would

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be necessary to make, and have answered, before any proposal to introduce the lime light into a lighthouse could be considered. These I beg to submit to the consideration of the Deputy-Master and Elder Brethren. As far as I am concerned, such preliminary inquiries and answers would be required in every like case.

I am, &c.

(Signed) M. FARADAY.

P. H. Berthon, Esq.,
&c. &c.

Inquiries, &c.

- The Trinity House cannot undertake to consider a mere proposition, or an imperfect arrangement, but only such subjects as are presented to them in a practical state.
 - The Trinity House cannot undertake to work out, or perfect, the application of a proposition, though it may feel justified in undertaking to test a perfected arrangement, upon good reasons and data being submitted to it.
 - In order to enable the Trinity House to judge whether a proposition made to them by parties, not practically experienced in the service of lighthouses, is well founded and has been thoroughly considered, it is desirable that certain questions should be answered, not from expectation only, but upon principle and from experience. These, in the present case, may be founded upon the requisites for a first order fixed light, and may be as follows:—
 - What is the quantity of light proposed to be supplied, expressed either in relation to a central Fresnel lamp of four wicks, or to an ordinary Argand burner, such as is used in a reflector?
 - The number of jets of gas required to ignite the lime?
 - The quantity of oxygen required for 12 hours?
 - The current price of the oxygen, i.e. the cost of materials, wages, repairs, and any other current expense?
 - The manner of storing the oxygen?
 - The nature of the gas fuel; the quantity required in 12 hours?
 - How is the gas fuel to be obtained? How is it to be stored?
 - What is its current price for 12 hours, including material, wages, repairs, and other current expenses?
 - What is the shape and size of the lime or focal light? How often will it require renewal? How or where is it to be obtained? and what will be its current cost?
 - What degree of steadiness will the light possess? Is it now as steady as a well burning lamp, or is it unsteady like a lamp in a draught? or does it sink and rise at intervals?
 - Will the attention of the keeper be, of necessity, perpetual? if not, for what intervals has the light been left, as yet, without falling off in character?
 - What is the vertical height, and horizontal width of the most intense part of the luminous object? and what the height of the part which may be called generally, intensely luminous?
 - What number of persons would it be necessary to employ upon the spot, in relation to the lighthouse? and what would be their occupations?
 - What buildings or outhouses for retorts, gasometers, &c., and what habitations, besides those now belonging to a first order lighthouse, would be required?
 - Are the means of obtaining the light considered as applicable only in favourable situations, or in all ordinary situations? In the latter case, let the reply have relation to such a lighthouse as that at Dungeness or Flamboro' Head.
 - Are there any exceptional cases where the light could not be applied with advantage, as the Needles, Eddystone, Bishops, Longships, Plymouth Breakwater, Casquets, Longstone, Bell Rock, Skerryvore, Stack, Smalls, Tuskar, and others? If so, are they supposed to be few or numerous?
 - Will the service of the lime light make it dependent upon the neighbourhood of a town? or if not so dependent, what kind of annual supplies, or supplies at considerable intervals, will probably be required?
 - What will be the probable outfit of the apparatus, with the buildings necessary for it, and for the accommodation of the extra staff required?
 - What will be the nature of the necessary repairs?
 - What will be the whole current expense of the application of the lime light (including royalty, &c.)?
- The Trinity House cannot authorize any chance of interference with the certainty of lighthouse action, by the introduction of any uncertain or unproved arrangements tending to disturb the actual service of the light. It therefore requires full proof of the fitness of any proposed arrangement before considering its introduction into a lighthouse.

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Any failure in such preliminary proof, or any serious departure in the results, from the answers given to the questions 4, 5, 6, 7, 9, 10, 11, 12, 13, 14, 16, 17, 18, 20, 23, which can be as well obtained out of a lighthouse as in it, will be considered as showing that the proposed application has not been sufficiently matured, and if not removed by further investigation and proof, will lead to the conclusion, that the method is not applicable to the service of light-houses.

February 8, 1860. (Signed) M. FARADAY.

7.

I. Sir J. F. W. HERSCHEL, Bart., of Collingwood, Hawkhurst, Kent.

II. I am disposed to believe that as a mode of producing an intense light, the simple combustion of oil (not previously reduced to gas by destructive distillation, apart) is superseded by many forms of illumination, practicable with ready access to those resources which can be commanded by money and science duly conjoined. Among others, the electric light, the lime light (with the recently improved mode of keeping up a steady supply of the lime cylinder), the combination of zinc, sulphur, or even phosphorus in oxygen, &c. The electric and the lime light appear to me, however (so far as my own knowledge and experience extend), the most practicable.

III. In remote and isolated positions, I should be disposed to adopt only such means of illumination as could be most securely relied on for continuous practical working, and in which difficult and delicate manipulations should not be required. Under almost any circumstances I should think it well to be provided with the means of readily substituting an oil illumination for any recondite form of light which might be liable suddenly to get out of order. I am of opinion that when the electric or lime light shall have become thoroughly reduced to practice in easily accessible situations, their use may be gradually extended to more remote ones, but not at once.

IV. A recent discovery of Prof. Liebig has supplied a mode of silvering (with a coating of perfectly pure silver, reflecting nearly 91 per cent. of the incident light*) glass surfaces of any figure and magnitude. A paraboloidal reflector of glass (worked by Foucault's process if necessary), to a perfectly true paraboloidal form, and so silvered, would, I apprehend, be very likely to supersede the polygonal lenses, &c. referred to as a means of throwing out the collected light of a central burner to a great distance. To give such a reflector its full effect, however, a very small and exceedingly intense central light would be almost indispensable, and for this purpose the electric stellar lights or the lime cylinder would be especially useful. Such a reflector must be made (or more than one) to revolve round the central light and sweep the horizon.

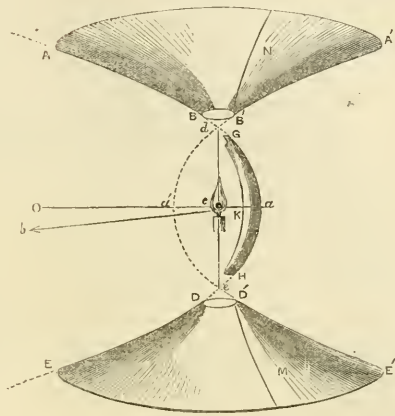
V. The object proposed being to illuminate with all the available light of the lamp the whole sea-surface extending to the visible horizon from a certain moderate distance from the foot of the light tower, and that continuously and simultaneously: the first plan I have to propose is by the use of a reflector or reflectors of peculiar construction, as follows:—

Ist. When not more than 180° of the circumference of the horizon requires to be illuminated. From the known mean temperature of the station during the night hours, and from the barometric pressure, corresponding to the height above the sea of the light, calculate the mean amount of the dip of the actually visible sea horizon (which is less than the geometrical dip) by the mean amount of the terrestrial refraction due to that height and horizontal distance), and let the angle so computed, diminished by the angle subtended at the light by the height of the deck of the largest ship placed on the verge of the visible horizon be denoted by d . Since mirage or cases of extraordinary refraction are extremely unlikely to occur at night, this may be taken as the depression

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below the geometrical horizon of the highest ray which the reflecting apparatus ought to send forth. That of the lowest may be computed from the height of the light and the given distance from the light-tower foot to the nearer limit of the area requiring reflected illumination; considering the sea surface as a plane and neglecting refraction. Let this be denoted by D , which, generally speaking, will not differ materially from 3 times d ($3d$), so that $D - d$ will be the angle between those extreme reflected rays, within which angle all the reflected light ought to be made to diverge and be scattered as equally as the nature of things will permit over the sea surface. This premised, let c (Fig. 1) be the centre of the light or the radiant point, here drawn as a simple candle, but which may be either a lamp, a lime cylinder, or an electric

(Fig. 1.)



star, the latter being in every respect preferable, from the intensity of its light, its concentration in a point, and its perfect transparency. Let d, e , be a vertical passing through c , and $a c b$, a line directed downwards at an angle of depression $O c b$, below the true horizon $c O$, equal to $\frac{1}{2}(D + d)$. Conceive an ellipse A, B, d, a, e, D, E , in a vertical plane, to be described, passing through e , a point below c (on whose distance from c the dimensions of the reflectors will depend), having c for one focus, a for the nearer vertex, and $a c b$, for the direction of its longer axis. The other focus of this ellipse is not represented in the figure; its distance from c , which is to be taken equal to twice $c e$, multiplied by the cotangent of half $(D - d)$, being too great. Its vertex a , then, will be distant from c by almost exactly half $c e$, because under the circumstances contemplated it will differ but little from a parabola, of which $d c e$, the double of $c e$, coincides very nearly in length and direction with the parameter. Now let this ellipse be supposed to revolve round $d c e$, as an axis, and it will generate a surface of revolution, consisting of two conoidal surfaces A, B, d, B', A' , and E, D, e, D', E' , the one above and the other below the light, and a spindle-shaped surface d, a, e, a' , between them, enclosing the light. Of these, let the portions B, d, B' , and D, e, D' , be cut away so as to allow the chimney of the light to pass through them (if a chimney be required). Of the spindle, let not only portions corresponding to those at the top and bottom be removed, but also the whole surface situated towards the sea (that is to say, half its entire surface), so as nowhere to intercept any direct ray from the radiant c , which can reach any point of the area proposed to be illuminated, and let G, a, H, K , be the portion remaining after such removal. Let this, and the two conoids be made of glass, silvered by Liebig's process (as improved by Messrs. Delarue and Miller), or, if it be required to extend the conoids to such diameters, that it would be too costly to execute them of that material, or if such silvered glass be considered otherwise objectionable, then of

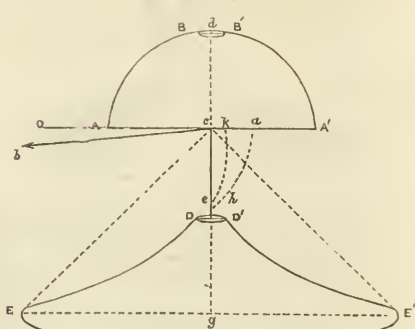
* By Steinheil's experiments. See also Jamin, *Ann. de Chem.* xix, 265.

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electro-plated copper, with a thick coat of *pure* and *HIGHLY HAMMERED* or *BURNISHED* silver, which reflects much more light than any other metallic surface. Only the spindle segment had better be of silvered glass, as it could with difficulty be burnished and kept clean, and scrupulously bright, if of metal. Since only half the horizon requires illumination, the halves M and N of the conoids behind the light being wholly shaded by the spindle, may be left unsilvered, or need not be constructed at all, which would save material and workmanship; but probably they had better be made and figured (roughly in these portions) complete, as so they would be less liable to breakage or flexure.

2d. In the case above considered, and with the form of construction there adopted, the lime cylinder is available; the portion of light reflected from the spindle segment intercepted by it being small. The whole light incident on the reflectors (with that exception) is in that case dispersed over the sea surface from the offing to such a distance from the shore, as may be considered essential (suppose 3 or 3½ miles), while the nearer portion of the sea within that limit receives the direct rays diverging downwards within the angle $b\ c\ E$. But those which diverge upwards within the angle $b\ c\ A$, are lost; and to obviate this loss, and so to utilize all the light from the radiant, as well as to effect the illumination of the whole circumference of the horizon, the construction represented in Fig. 2

(Fig. 2.)



is proposed, in which the upper conoid and the whole of the spindle-shaped reflector are suppressed, and their places supplied by a concave hemispherical reflector A, B, B', A', having the radiant point c for its centre. On the same ingenious principle (from which this adaptation is avowedly borrowed) as the concave hemisphere attached to Mr. Stevenson's paraboloidal reflector behind the lamp utilizes all the rays diverging over the posterior hemisphere; so, here, all the light diverging upwards is turned back, and passing again through c, radiates thence downwards, and in effect nearly doubles its intensity; each ray pursuing the same course and finding its place on the same point of the sea surface, on the direct ray from c, with which it coincides. And here it should be observed, that both to this and to Stevenson's paraboloid with that addition, the same objection to the use of a lime cylinder as a radiant applies. If well centred, the whole of the light reflected from the hemisphere must be thrown back on the lime and stopped. The electric star is the fitting radiant for both, though the lamp may also be used.

In this construction the ellipse, by whose revolution about the vertical axis d, e , the conoid E, e, E', is generated, is not the same with that employed in the former case, and $\frac{1}{2}$ is thus determined. D and d denoting as before, let p and q represent respectively the heights $c\ e$, and $e\ g$; those, namely, of the radiant above the summit of the conoid, and of that summit above its base—then will the angle of depression O, c, b, of the longer

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axis be found by calculating the value of the algebraic expression,

$$(p + q) D - p d,$$

the distance from c of the other focus by that of $q \cdot \cotang. (D - d)$.

and the average intensity of the reflected light compared with that afforded by the direct light of the radiant, at a point on the sea surface, by that of

$$\frac{2 \cdot \text{versed sine of } E\ c\ g,}{\text{Sine of } (D - d)}$$

By diminishing $c\ e$, then and increasing $e\ g$, that is to say, by flattening the conoid and enlarging its base to the greatest practicable extent, and by placing its summit as little below the level of the radiant as the nature of the light and its mechanical arrangements will admit, the intensity of the reflected beam (or rather sheet of reflected light) will be rendered a maximum. Thus supposing the sea surface, on which is thrown to subtend an angle at the light of $\frac{1}{2}$ of a degree, or $D - d = 45$, the height of the conoid to be 12 inches, that of the light above its summit 6 inches, and the diameter of its base 4 feet, which would give for the distance of the other focus of its ellipse 76 feet 5 inches; the average intensity of the reflected would exceed that of the direct light (supposing 15 per cent. of light lost by reflexions) in the ratio of 53 to 1. The diameter of the hemisphere A, B, A', appropriate to such a conoid would be about 18 inches.

3rd. If it be not required to irradiate the whole horizon, but only a certain large portion of it, the construction of V. 2 may still be adopted, but with the addition of the lower half a, h, k, Fig. 2, of a spindle segment like that in Fig. 1; the curve of which should be, not a continuation of the same ellipse E, D, e, which defines the conoid, but, identical with that described in the other construction, i.e., a continuation of the ellipse A, B, or E, D, of Fig. 1. This will receive and utilize, as there described, not only the light diverging downwards over the angle A', c, E', towards the land side, but also that diverging upwards over the corresponding angle on the sea side, reflected from the hemisphere.

4th. It remains to say something of the practical execution and figuring of the reflecting surfaces required in these constructions. The only one which would present any difficulty is the complete spindle segment G, a, H, Fig. 1, on account of its deep concavity and considerable variation of curvature; the upper half obstructing access to the lower. The half-spindle of Fig. 2 would be of much easier construction, and both it and the conoid might be figured with the utmost facility to any degree of optical precision by a hand-grinding process for glass, or a hand-hammering and polishing one for silvered copper, on the principle of M. Foucault's process for giving a perfect parabolic figure to a glass or metallic speculum. The correct elliptic curve being calculated, and the surface roughly turned or otherwise modelled to a general and approximate conformity to it; a divergent very small and brilliant point of light should be placed in c, and the eye of an observer (looking through a small circular hole) carried round in the circle described by the other focus (which will seldom be more than 100 or 150 feet distant, and but little below the level of the base of the conoid). The surface must be reduced by grinding and polishing until every part of it, so examined, is found to reflect the light of c into the eye when situated in that part of the focal surface corresponding to its situation. The hemisphere would present no difficulty beyond what is already satisfactorily overcome in Stevenson's construction.

5th. The problem proposed admits of another solution (which might possibly be found equally or more advantageous in practice, though more expensive) if the condition of continuous and simultaneous illumination over the whole sea surface be so interpreted as not to exclude continual visibility at every point by flashes succeeding each other, two, three, or four times in a second of time. Hitherto, in the cases where

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revolving lights are used, the period of rotation of the apparatus occupies several minutes, and each appearance of the light is gradual, rising to a maximum and dying away during at least 15 or 20 seconds, with intervals of darkness as long or longer. This gives time for uncertainty as to position arising from motion in the ship during the intervals, or from the occurrence, between successive appearances, of fog drifts or rain squalls; whereas, were the rotation rendered so rapid as to present the light at the small intervals above mentioned, the eye would have no time to wander from the right direction between the flashes. No very great speed of the driving machinery would be required. A frame carrying 8 lights, mounted with Stevenson's paraboloid, or 8 polyzonal lenses with one central light, would not be required to revolve more than once or twice in a second. Considering the perfection which heavy machinery has attained, this cannot be held inconsistent with complete security, supposing the framework and mountings of the lenses or reflectors strongly constructed. The only objection seems to be that in the case of oil lamps carried round, their flames might be disturbed by the commotion of the air. This would not apply to a single central lamp, nor to electric stars, which might revolve with any degree of rapidity without the slightest disturbance of their light. In the event of this latter mode of illumination being resorted to, the conductor or conductors must be carried both up and down through the common axis of rotation, which must rest on a shoulder or in a conical pivot hole open beneath, leaving its lower extremity exposed and free, to allow the issuing wires to form their appropriate mercurial or frictional contacts, which shall bring them into connexion with the battery or batteries below. It is only necessary to add, that the intention being to illuminate indifferently the whole sea area, and not to project a concentrated beam out to the extreme offing, hollow ellipsoids of revolution must be substituted for paraboloids, if Stevenson's construction be adopted, having their focal lengths determined as in V. 1, and their axes somewhat less depressed than there proposed, the only difference being that the ellipse A, B, a, D, E, (Fig. 1.) for this purpose, instead of being conceived to revolve round *d, e*, as an axis to generate the reflecting surface, must be supposed to revolve round *a c b*. I would be understood, however, rather to throw out this solution of the problem as a suggestion for trial than as speaking very confidently of its success in the absence of any positive knowledge of the least time required for a given light to make its full impression on the eye. With 8 burners, and a rotation twice in a second, the beam of light, whose theoretical angular amplitude would barely exceed half a degree, would pass across the eye in the 120th part of a second. But as it is scarcely possible, with whatever perfection in the reflectors, considering the large size of oil flames, or even the diameter of a lime cylinder, that with these at least the theoretical amplitude should not be greatly exceeded; if we allow 2° instead of half a degree, the flashes will still be of only 1-30th of a second in duration with intervals of 29-30ths, and I am not prepared to say positively how far a light, such as is contemplated, might have its effect on the eye enfeebled by so short a duration. An important series of experiments on this very point is in progress by Professor Swan of St. Andrew's, which will, in all probability, speedily decide this question, or, perhaps, it might not be impracticable to subject it to direct experiment by urging, temporarily, and for one or two nights trial, the framework of some existing revolving light to the required speed, whether by laying on power or by throwing the wheel work out of gear, and applying a different motive power to the frame.

VII. *a*. See reply to Query 4. Liebig's process for silvicing is given in the *Annalen des Chemie und Pharmacie*, xxviii. p. 132. Foucault's process of giving a parabolic figure in the "Notices of the *Astronomical Society*," vol. xix. p. 284.

VIII. Coloured glass acts by the destruction of a large percentage of the total incident white light. It is, therefore, a highly objectionable thing *per se*, but I am not prepared to propound any naturally

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coloured flame as capable of yielding a very intense light. It is very possible that by substituting a cylinder of strontia for lime, or impregnating the lime with strontia, a very luminous red might be produced; but I have no experiments on a large scale to cite. Chloride of copper might give a green tinge, but would require constant renewal.

IX. *b*. The colours of most transparent media deepen by heat, and as the chimney is intensely heated, I should fear that a chimney of coloured glass would destroy an unduly large percentage of light, and a variable one, depending on the temperature of the chimney at the moment.

X. *a*. In all weathers (meaning of course in hazy weather, the purest white is most likely to penetrate farthest, not by reason of its colour, but its intensity. Red is best distinguished as a colour from white, but it should rather be a luminous orange red (as transmitted through a not strongly coloured brown glass), or the very luminous red, communicated by oxide of silver (? gold) to glasses (such as the more brilliant ancient church window rose-red). Blue glasses coloured with cobalt transmit a very complex light, and are to be especially avoided. PALE red and PALE green give a good contrast, but there is a chance of colour-blind persons not perceiving it.

b. In fog, white by all means, *i.e.*, the unintercepted total light (of whatever colour) the most intense the lamps can give. No sacrifice of light by any sort of obstruction or interception can be tolerated in fog. A fog is sometimes red or yellow, but it would be absurd, therefore, to use a red or yellow glass to colour the light in agreement with the fog. These could only act by destroying the green and blue rays, which the fog would do without their help.

XVIII., XIX. Every one has remarked the great distance to which a steam railway whistle may be heard, but it would be worth trial what would be the effect of a battery of such whistles (blown by high-pressure steam), or by a combination of 3 (or several sets of 3), pitched exactly to harmonic intervals (key note, 3rd, 5th, and octave), but all of a very high pitch, and with a rattle (analogous to the pea in a common whistle), which intensifies the action on the auditory nerve, as a quick sparkling glitter does to the optic nerve, or as the interrupted shock of the medico-galvanic apparatus to the nerves of feeling.

XX. I know of none other than concave reflectors (large and of close textured material) or funnel-shaped apertures.

[N.B.—I have not a doubt that a subaqueous linear propagation of sound to very great distances in given precise directions might be accomplished by explosions or other sudden sounds in the focus of large and heavy parabolic reflectors. I set down this suggestion here to prevent its being patented hereafter.]

XXI. Above the probable level of the densest portions of the usual fogs of the locality, so as to give the greatest possible extent to the sound wave in the clear air, which might radiate thence downwards, by dispersion, into the fog from above.

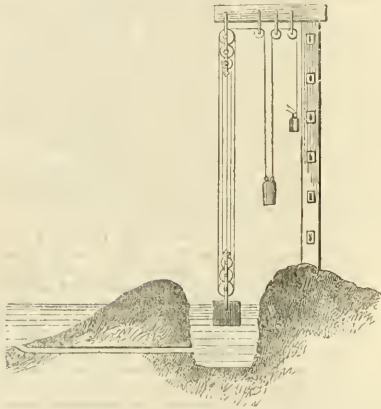
XXII. This must entirely depend on the local peculiarities in respect of fog or haze. I have been informed that a light on the High Chalk Cliff, St. Catherine's Down, on the south coast of the Isle of Wight, was rendered useless by its too great elevation. In bad weather, when lights are most needed, clouds are low; actual cloud I presume, however, seldom descends to 200 feet above the sea level, but rain is actually more copious at lower levels than at higher, and rain intercepts light as well as cloud.

XXIII. The most important meteorological communication which could be telegraphed would be information just fresh received per telegraph of a cyclone actually in progress at a great distance, and working its way towards the locality. There is no doubt that the progress of a cyclone may be so telegraphed, and might secure many a ship from danger by forewarning it. As to the form, I have no suggestion.

XXIV. Some localities may be well adapted to one system,

Sir J. F. W. HERSCHEL.

some to another. The following seems to be universally applicable. Suppose the spring tides, for instance, to rise and fall six feet; to enlarge this to, say sixty, and render it and its single feet visible to a distant ship, attach a float to a ten-foot pulley, and let the cord, fixed at one end to the float, carry at the other loose end a bright lamp, which thus will rise and fall sixty feet; let it travel up and down a mast or other erection sixty feet high, and pass in succession six fixed lamps at ten feet distance from each other. Or the arrangement figured below may be adopted, which will make the rise and fall of the lamp correspond with those of the water.



XXV. a, b. On this point Mr. Babbage has some excellent ideas. If a copy of these queries have not been already sent him, it would be highly advisable to do so.

CIRCULAR No. II.

- I. There seems to be no possible doubt as to the propriety of giving the manufacturer employed in constructing such an apparatus all possible information as to the circumstances under which it is intended to be used, and the precise nature and extent of the objects it is to accomplish. Where a definite are in the horizon only is to be illuminated, this information may lead to economy in the construction, or to peculiar adaptations of a special nature suiting the locality.
- II. Most assuredly. If the information in question is of any importance at all, it ought to enter into and form a part of the working plan of the maker of the apparatus, so that he shall not have to alter his patterns, fittings, or any other part of his work.
- III, IV. Unable to give any satisfactory reply.

Memorandum.—While these replies are passing through the press, I observe in Mr. T. Stevenson's valuable work "On Lighthouse Illumination on the Holophotal System," which I had not seen when the constructions in my replies to Query V. were devised (my knowledge of his hemispherical appendage being derived from another quarter), that a construction identical in its general principle with the first of those (V. I.) Fig. J, has been already proposed by M. Bordier Marcet and executed by Mr. A. Gordon. In Marcet's construction, however, the generating curve A, B, a, D, E, is a parabola, having its axis horizontal, by which arrangement the light, instead of being dispersed over the visible sea surface, is thrown out in a parallel horizontal sheet into the air beyond the offing; and only irregularly reflected rays, or those emanating from the unfocused portions of the lamp-flame, can reach the surface.

June 24, 1860.

J. F. W. II.

S.

- I. Colonel J. T. SMITH, late of the Madras Engineers.
- II, III. I know of no improvements.

Col. J. T. SMITH.

V. In a separate memorandum (A.) I have mentioned two modifications of the existing arrangements, one of which has been tried with success, the other was proposed by me many years ago.

(A.)

Under special circumstances I adopted a "reciprocating" light for Madras, which has now been in use 16 years, and answers the purpose exceedingly well, being more economical than an ordinary revolving light, in the ratio of three to five. The same principle has been applied elsewhere, but it is not advisable in any case where it is, or may hereafter be important to measure the exact periods of light and darkness.

I have long been of opinion that an improvement may be made in the method of utilizing light by refraction. The change I propose being that of using crossed prisms instead of lenses for revolving lights, somewhat like what has already been done by M. Fresnel, but differing in this, that instead of the prisms being of very nearly the same focal distance, they should be materially and essentially different; that which collects the rays horizontally being much shorter, with the view of increasing the horizontal divergence of the beam, and consequent length of the flash. On this subject a paper was submitted by me to the Honourable Trinity Board 23 years ago, viz., on the 11th August 1837, and I should be very glad, if any solid objection has been urged against the views therein stated, to be made acquainted with it. It appears to me that any plan which bids fair to add length to the flash of the French lens, (at present only 4° or 5°) is deserving of experimental trial.

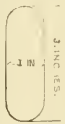
V. Theoretically, and in the abstract, nothing can be superior to Fresnel's catadioptric system; but, nevertheless, in certain cases the catoptric method is preferable; and a slight modification of this, which I have detailed in memorandum (B.), is, I think, worthy of experiment.

(B.)

In remote inaccessible localities, where the apparatus for fixed lights is required to be simple, more especially if only a part of the horizon is to be illuminated, the catoptric is superior to the dioptric system, and any improvement of the former may be of value. I would suggest the trial of a different form of lamp from that commonly used with the parabolic reflector. Instead of having a circular wick of one inch diameter, I propose to try an oval shape, or rather rectangular, with circular ends, thus, placed with its longest diameter in line with the axis. This would much increase the power of the reflector; and I calculate, when several are used to fill adjoining parts of the horizon, each would fill 22° with an uniform amount of light, equalling 350 Argand flames. If this be correct, 18 reflectors would amply fill 360° of the horizon (and a smaller number in proportion any part of it), while to produce an equal effect with the common Trinity House mirror of three inches focus, I calculate 45 would be necessary. The consumption of oil, however, by the new lamps would be greater than the present, in the proportion of seven to three, so that there would be little or no economy of oil. The improvement to be looked for (the plan has not been tried) would be the more perfect uniformity of the belt of rays produced by a series of reflectors, and the convenience of accomplishing the object with a much smaller number of them.

I ought not to omit to mention the system of fixed lights adopted by me in 1839, and which has been in use ever since, and is now established in 15 to 20 different localities in India, where it has given great satisfaction. It consists of a series of reflectors of a peculiar shape, which I have called "periscope," and they possess the advantage of giving perfectly uniform light throughout 180° of the horizon, of any required degree of power, varying from about 50 Argand flames (the effect of one lamp and reflector) to 360 or more, according to the number used. They have hitherto been generally applied three or four together, and it has been found that four to six, combined, give an excellent light for 16 or 18 miles distance. Twenty-four "periscope" reflectors, 3 feet high, $1\frac{1}{2}$ feet broad, would fill the whole circumference with the uniform light of 360 Argand flames, consuming no more oil than 24 common Argand lamps; but they are not suited for the Argand lamp, having a lamp of their own, of peculiarly simple construction, which is a great advantage where trained light-keepers cannot be had.

This system is referred to by Mr. Alan Stevenson in his rudimentary treatise on lighthouses, Part I. p. 121, though in terms of disparagement. It is true the instruments are



Col. J. T. SMITH.

theoretically inferior in respect to the collection and utilisation of the rays, even to the common parabolic mirror, but they have nevertheless been found practically of the greatest use in situations where more perfect and complicated apparatus would be worthless, and I am of opinion that the principle of the system is deserving of attention and some little trouble taken for its improvement. It is apt to be hastily condemned, because *one* periscopic reflector, in any given azimuth, is only one-twelfth as powerful as a common parabolic reflector; it being overlooked that it is at the same time doing the work, in part, of 11 other reflectors; so that when 12 of each are compared together, the "periscopic" may have the advantage.

VII.—X. I have no suggestions to make.

XI.—XVI. I have no new method to propose.

XVII.—XXV. I have no suggestions to offer on this subject.

CIRCULAR No. II.

I. If by "manufacturer" we are to understand the person who is to design the arrangement and specify the apparatus to be used, I should think it would be not only advantageous, but necessary that he should have the information referred to, especially *b*; but the purpose for which the information is required falls within the province of the lighthouse Engineer, rather than of the manufacturer.

II. The whole arrangement of the apparatus, and exact position of every part, ought certainly to be settled before any new work of a special character is begun; and for that purpose the information is required, as above stated. But all the various instruments now used, such as polyzonal lenses, cylindrical refractors, catadioptric zones, holo-photal lenses and reflectors, parabolic and other mirrors, with their lamps, are themselves, I believe, made according to fixed patterns; and if they are to be used entire, it would be immaterial in what way they are afterwards arranged, except in rare cases.

III. I think, perhaps, I do not quite comprehend the meaning of this question. I am not aware that it is usual to alter the details of the *instruments* to suit the height from which they are to be exhibited. In ordinary cases, the vertical divergence of the rays is sufficient to meet the requirements; if not, an angle of depression may be given to the axis of the beam of rays from a reflector or refractor, by "canting" it forwards, or placing the lamp a little above the true focus; and the latter method may be applied to a cylindrical refractor.

In regard to the horizontal arc to be filled, there are so many different points to be considered in each case, and so many different kinds of instruments, all of different special qualities and uses, from which the most appropriate selection is to be made, that I do not think the case could be met by any table. Perhaps an instance may make this clear. I have just been asked to design a light, of which the requirements are as follows:—It is to be in a remote and very inaccessible locality, inhabited by *extremely* ignorant people. Height, 350 feet, are to be illuminated about 200°; but the middle part of this arc, say 160°, only requires a comparatively feeble illumination, the two edges, say of 20° each, must be lighted with the full strength, visible 25 miles. Great simplicity of the working parts desirable. All these considerations could not be expressed by numbers, or tabulated. I think it probable that four "periscopic" and four common parabolic, or perhaps, even, holo-photal mirrors, may suit the objects required.

The design and arrangement of the apparatus to be used, and the mode of using it, must be made by a person thoroughly conversant with the subject, and well acquainted with every kind of instrument, and the precise capabilities and virtues of each; and to such a person, it appears to me, no table would be of much use.

IV. I have never met or heard of any such a table as that proposed.

9.

I. RICHARD POTTER, A.M., formerly Fellow of Queens' College, Cambridge; Professor of Natural Philosophy and Astronomy in University College, London.

Professor POTTER.

II. I am not aware of any light which I think in all respects preferable to an oil or gas lamp of the best construction. I know well the lime light and electric light, they give *very bright* light from *small* shining surfaces, and in some optical experiments this is a great advantage, but in lighthouses a *much larger* quantity of light must be needed, although it may arise from flames with very much greater shining surfaces.

III. From the answer to question II., it must arise that I think, independently of the labour and attention which the lime light and electric light require, the most improved forms of oil and gas lights should be employed.

IV. My experiments in photometry made many years ago were the most extensive and various that have ever been undertaken. My experience and my actual determination of the loss of light in passing through a thickness of two inches of clear flint glass have long led me to doubt the great advantages which have been claimed for the polyzonal lenses of M. Fresnel. I found about *one-fourth* of the light to be lost by reflection and absorption in passing through a thickness of *two inches* of such glass with highly polished surfaces. I found in like manner that good ordinary looking glass reflects *sixths* to *two-thirds* of the light falling upon it, and that highly polished mirrors of speculum metal, as used in the reflecting telescope, reflect still more, according with Sir Wm. Herschel's results. I accordingly see that little, if any, advantage is gained in the quantity of transmitted light of a polyzonal lens over the quantity of reflected light from mirrors of ordinary looking glass of the same apertures, and if mirrors of proper form and size could be obtained of the new silvered glass, I think the quantity of light from a given lamp would be much in favour of the mirror. Other objections against the polyzonal lens are, the loss of light by obstruction of the opaque mounting of the segments, and the impossibility of thus building up the lens with true optical accuracy. Nevertheless, where the light is required to be continuous in all directions around a lighthouse of low elevation, and therefore the offing is not very distant, the *refracting* method of concentrating the light might be the best, since the mirror obstructs the light in one direction, whilst lenses may be placed all around it. In the latter circumstances *semi-cylindrical* rings of glass around the flame might be tried to concentrate the light upon all points of the offing at the same time. If an illumination upon or within the horizon may be at *recurring* intervals, then from what has been said it will be seen that I think the best mirrors and best oil and gas lamps will be the most serviceable apparatus; remembering also that mirrors can be made of much larger proportional apertures than lenses.

V. I think for *continuous* illumination, and in *all directions* around the light at the *same time*, that *semi-cylindrical* rings of glass around the light will be the most effective.

VI. I think the semi-cylindrical ring of glass the best concentrator of the light of a floating light, because the offing will never be very distant, and a continuous bright light in all directions is very desirable.

VII. *a*. I think, as before stated, that the new chemically silvered glass mirrors should be carefully tried for mirrors of lighthouses. I expect there would be no difficulty in getting the plate glass formed and polished to a true parabolic figure before the silvering took place.

c. The manufacture of the *semi-cylindrical* rings before named would, I think, offer no difficulty.

d. I think, where a parabolic mirror is used, the light from the front of the lamp not falling upon the mirror might be employed by means of mirrors, prisms, or semi-cylinders of glass to illuminate the objects on or near the surface of the sea near to the lighthouse.

VIII. I think glass prisms of considerable size may be used to produce coloured beams of light with advantage in *some* cases, but in others coloured glasses must be resorted to at a greater or less distance from the flame of the light, to be determined by experiment.

IX. *a*. The light of oil and gas flames is a *full orange* light, as is easily shown by comparing it by photometry

Professor POTTER.

- with daylight, and it contains only a small proportion of blue light, so that dark blue glasses will transmit but little light from such flames, and are therefore very objectionable.
- b. If sufficient changes can be produced by green and red glasses they should be employed only, and not too dark, but changing from one to the other quickly, as the eye is impressed by contrasts, but soon accommodates itself to one species of illumination.
- X. a. It will be seen in the answer to the last question the nature of oil and gas flames restricts the coloured glasses to shades ranging through red, orange, yellow, and green.
- b. I consider that white light is unattainable for lighthouses. I think the *large quantity* of light from large flames the best in hazy or foggy weather.
- XI. a. I think the succession of colours from the beam given by a large prism might be employed to indicate the distance from the light when sailing near to it, or a series of coloured glasses might be used, the vessel coming into green light being in danger, and into red light being in excessive danger.
- b. The mechanical arrangements to be ascertained after the success of the previous step is known.
- XVI. c. I think buoys may have *strong hermetically sealed spherical silvered glass bottles* attached to them, which could be illuminated from a distant shore, so as to be seen from vessels *near them* in any direction.
- XVIII. A steam trumpet or horn is used in the neighbourhood of Hampstead Road, and when it roars it would awaken the sleepest subject, and it is heard to great distances when bells are not heard.
- XX. They might be directed to try the ear-trumpet to determine the direction of sound.
- XXII. In certain situations both high and low lights should be used. When low lights were not used, powerful reflectors near the shore, receiving light from the high light, might be used.

10.

- I. G. A. MILLER, Lamp Maker to the Admiralty, 179, Piccadilly.
- II. I am not aware of any better method than burning oil.
- V. Our experience extends to the manufacture of lamps with lenses of various sizes up to eight inches in diameter. *Plano-convex* lenses are seen at the greatest distance, if accurately formed and the lamps well made. A modification of this form into curves is necessary for *spreading* light, but which it is obvious is proportionately weakened in the distance.
- VII. a. The best and most convenient material for reflectors is well-plated copper, and the parabolic form, reflecting the light parallel to the axis, is best calculated for lights to be seen at the greatest distance.
- b. c. d. Messrs. Chance and Co., Birmingham, would afford this information.
- VIII. No.
- IX. a. Messrs. Chance and Co., Birmingham.
- b. Coloured lenses being now made very brilliant by means of coating, are preferable to loose glasses, where they can be used as being more simple and safer.
- X. a. Bright ruby. The tint to be in relation to the power of the flame.
- b. Bright ruby would, I think, be best distinguished.
- XII., XIII. We have no experience in the manufacture of lighthouses.

11.

- I. ROBERT MALLET, Mem. Ins. C.E., F.R.S., 11, Bridge Street, Westminster, and 97, Capel Street, Dublin.
- II. In lighthouses easy of access, I am in possession of plans for illuminating by good coal gas, which I wish to lay before the Commission. The mode of illumination is catadioptric. The gas is burnt by a method much superior to any hitherto suggested, and the discoverable causes of accidental extinction are nullified. In cheapness nothing approaches gas.
- III. I do not, in the case of floating or remote and perfectly insulated lights. It is applicable to all shore lights.

Mr. ROBERT MALLET.

- IV. I am not prepared to answer this briefly.
- V. Totally reflecting prisms, or those in combination with polyzonal lenses.
- VI. With sufficient size of lightship to admit of making good coal gas on board, I see no difficulty in adapting my method to floating lights.
- VII. d. A part of my arrangements have this in view.
- VIII. When the application of magneto-electric light shall have been practically perfected, it is not difficult to see that means will be developed of producing (at will) changes of colour incomparably superior to any device hitherto proposed.
- X. b. Practically, I believe white light the best.
- XII. I am prepared to suggest methods of construction in malleable iron (plate iron principally) calculated to produce great reduction in cost, rapidity of execution, and without loss either of stability or of durability. The same applies to beacons.
- XV. a. I believe the ease of riding may be materially improved, as also the safety, by a better point of application of the cable to the ship, and by elastic connection.
- XVI. c. When the magneto-electric illumination shall have become perfected this will be easily accomplished.
- XVIII., XIX., XX. To the subject of fog signals I have devoted a good deal of attention, and am desirous of laying before the Commission designs for acoustic signals, which I deem to embrace important improvements. *Explosive* sounds are those that will penetrate furthest. Of *continuous* sounds, those of high pitch are heard best. *Explosive* sounds give the best indications of direction.
- XX bis. My improvements particularly refer to these.
- XXI. Depends upon the average height of sea fogs above the water at the place. This being known, a principle to fix the height may be shown.
- XXII. Answer to XXI. embraces a good deal of this.
- XXIII. Wind in shore, and movement of the barometer at the site, I should suppose, but am not specially informed on this head.

CIRCULAR No. II.

- I. I think both should be officially given in all cases. The information under letter *b*, so far as my information extends, is *always* given at present.
- II. If given at all, they should clearly be given in the first instance.
- III. It would; but in the hands of the manufacturer I doubt its utility.
- IV. I believe not. The *methods* of the manufacturers I have reason to think are not conducted with rigid regard to scientific rule.

12.

- I. ROBERT FITZROY, Rear-Admiral.
- II. I do not think that any method is preferable to the *best* arrangement for burning *vegetable* oil with oxygen gas.
- III. No method is so generally reliable, under all varieties of circumstances, as that of burning good oil.
- IV. Large polyzonal lenses, or sections of a circular lens.
- V. The answer to No. IV. refers to *revolving* light; this question (V.) having reference to *fixed* light is separated in character. My reply is,—Combined dioptric and catadioptric sections of lenses and prisms.
- VI. By no means. A floating light should have a combination of parabolic reflectors and Argand lamps, so fitted as to preserve the reflector vertical in any motion of the ship.
- VII. a. Reflectors should be, in their horizontal section, hyperbolas; but in vertical section, parabolas, where light is to be spread horizontally. The purest copper, well silvered and highly polished, should be used.
- b. Glass should be the very purest flint, without lead or other mixture that may injure its transparency when heated.
- c. Lenses and prisms should be as perfect as art and money can obtain, since the least deviation from exact mathematical accuracy in the prism near the centre (or focus) of light, magnifies, in proportion to the distance, error of direction in the refracted or reflected ray.

Rear-Admiral FITZROY.

- d.* Optical apparatus should be so placed as to throw the light to the visible horizon, and thence to within a cable's length of the lantern; *not* horizontally, if the light be much elevated.
- VIII. Coloured glass is the surest under all circumstances; but colour is suitable only for limited distances and minor uses, such as those of harbours and narrow waters.
- IX. *a.* Coloured glass should be very pure and free from lead, or it will soon become opaque after being continuously heated.
- b.* Coloured glass, so placed *without* the lens as to be accessible for *cleaning*, and as thin as may be consistent with sufficient strength, is better than coloured chimnies (which intercept too much light, and become less transparent, if not opaque, by heat,) or coloured panes, or screens *within* the lens (which are not so accessible for cleaning). The panes of a lantern are too thick to bear being well *coloured*, without an approach to *obscurity*.
- X. *a.* Red, blue, and green, in this order of visibility; but neither can be seen at a long distance.
- b.* White light, as by far the most powerful; but no light can be seen far, if at all, in a fog.
- XI. Yes, more than one.
- a.* Vertical angles of the lantern with the base of the tower, or the water line below it, and the distance run by time and log, will give the distance of the light trigonometrically.
- b.* Assume a height and compute distance as above. Run a second short distance by log, and take vertical angle; compute the same angle. If too large, try a less height; if too small an angle, try a greater assumed height, till the observed and computed angles agree. This may be done by inspection with an ordinary masthead table, quite near enough for common practical purposes.

For such merely *approximate* measurements a sextant answers (on and off the arc), but a Rochon or other surveying micrometer is better. The light tower itself, or its summit above the water line, serving as a base for rough calculation.

- XII. *a. b.* This question is too extensive, and varies too much with localities, to be here answered specifically. Each place may differ more or less from others.
- XIII. My acquaintance with many late improvements does not enable me to reply.
- XIV. Such a form as will give sufficient stability and easy motion with the least resistance to currents and winds.
- A form, moreover, that will enable a constant supervision of the moorings to be vigilantly kept, and a comparatively easy substitution of chains or ground tackle.
- XV. *a. b.* Answers to these questions would vary with the localities implied.
- XVI. *a. b.* Similar replies.
- c.* For *temporary* purposes *only* small strong lanterns may be attached. In some few places a flexible gas pipe might be attached to a buoy.
- XVII. No: buoyage is dependent, essentially, on local circumstances, and cannot be *generalized* without incurring risks infinitely disproportionate to the (theoretical?) advantages.
- XVIII. A sharp or high *pitch*, such as that of a screech or whistle, or a fog horn. I think the fog horn, if well made and worked by lever pressure, is the most powerful *high* sound.
- XIX. Guns and large gongs or bells.
- XX. Trumpet-mouthed devices. Such contrivances send sound in concentrated lines, showing whence it comes.
- XXI. As low as possible. Sound travels along water farther than through unconfined air. It usually rises as it diverges.
- XXII. The elevation ought to depend partly on the object of the light and its power. If for a "landfall light" of the "first order," it may be a few hundred feet above the sea (not more than 500 however), but if for a warning or leading light, the lower it is the better, if not below 50 feet (to clear the spray).
- XXIII. Height of barometer, wind and weather expected, received from Coast Guard, by telegraph, from

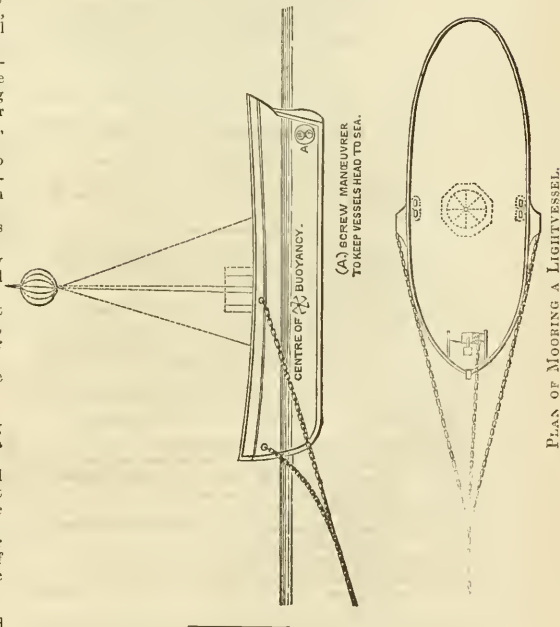
Rear-Admiral FITZROY.

other places, or from their own means and knowledge.

- XXIV. Balls and cones by day; coloured lights by night.
- XXV. *a.* By colours, stripes, bars, ball or triagle devices in white, black, or red, and by special marks (such as a pillar) near the tower or building. Floating lights should have framed balls or cones at their mastheads, painted red or black.
- b.* Yes; in some places a tall tower showing a high and a low light, one at least 50 feet above the other, vertically, would be a desirable variety. No system of letters lighted at night can serve, because all such small lights near each other either blend or do not show with distinctness at a comparatively short distance.

13.

- I. JOSEPH H. RITCHIE, Surveyor to Lloyd's, No. 2, White Lion Court, Cornhill, London.
- II. The only suggestions I can make will be found in answer to questions 14 and 15.
- XIV., XV. I would advise that the moorings should "enter" the light-vessel on *each* side *over her centre of buoyancy* by using bridle chains shackled to the main mooring chains at a convenient distance ahead, the main mooring chain being allowed to hang slack from the shackle of the bridle chains to the bows of the light-vessel, as shown in the sketch below. The light-vessel could with ease be always brought to "ride head to sea" by having a small transverse screw fitted through her after deadwood, to be worked by wheel and pinion with crank handles on deck; this arrangement has been patented under the name of the "Ship Manœuvrer."



14.

- I. WILLIAM JOHN MACQUORN RANKINE, Civil Engineer, LL.D., Professor of Civil Engineering and Mechanics in the University of Glasgow.
- II. Not that I know of by my own observation.
- IV. Polygonal lenses and totally reflecting prisms, in a frame surrounding one central lamp. When it is required to concentrate the light into one beam, a "holophotal" glass reflector to be combined with a polygonal lens and totally reflecting prisms. (See "Thomas Stevenson on Lighthouse Illumination.")

Professor WILLIAM JOHN MACQUORN RANKINE.

Mr. WILLIAM AUSTIN.

- V. To illuminate the whole horizon, ring-shaped lenses and totally reflecting prisms of figures described about a vertical axis. To illuminate an arc of the horizon, these to be suitably combined with holophotal reflectors and prisms.

- V. A globe with lights or disc on the four cardinal points.
- VI. Yes.
- X. a. Red.

- X. a. Red.
- b. White.

- XI. To determine the distance of a light while sailing directly towards it, on the supposition that the effect of atmospheric refraction is inappreciable.

a. The height of the ship's deck above the water being also known, let the difference of those two heights, that is, the height of the light above the level of the ship's deck, be denoted by l .

By means of an instrument capable of measuring angles of altitude at night (such as that invented by Professor Piazzi Smyth, Astronomer Royal for Scotland), take the altitude of the light. Let this angle be denoted by A .

Let R denote the earth's radius, that is, on an average, about 20,887,500 feet, or 3,438 nautical miles.

Let x be the distance from the ship to the light, then, very nearly,

$$x = \sqrt{2Rl + R^2 \tan^2 A} - R \tan A.$$

If R and l are both expressed in feet, x will be computed in feet also, which may be reduced to nautical miles. If it is preferred to compute the distance in nautical miles at once, the height l should be reduced to a fraction of a nautical mile, and the radius of the earth R also expressed in nautical miles.

- b. Take a first altitude of the light, and let it be denoted by A' .

After the vessel has run a known distance, as measured by the log, directly towards the light, take a second altitude of the light A'' . Let D be the distance run in the interval between taking the two altitudes.

Let R denote, as before, the radius of the earth.

Let x be the distance of the ship from the light at the instant of taking the second altitude:—then,

$$x = \left\{ \frac{D^2}{2R} + D \tan A'' \right\} \div (\tan A'' - \tan A' - \frac{D}{R})$$

Effect of Refraction.

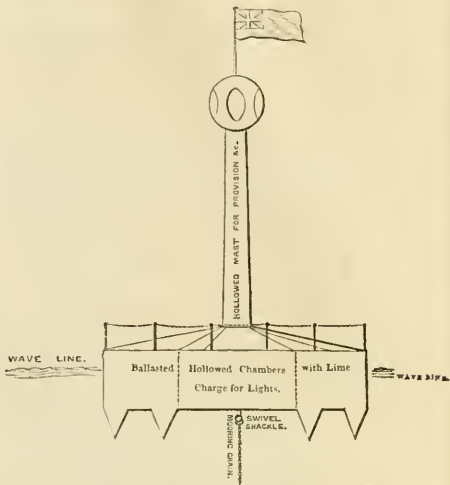
According to the mode of allowing for terrestrial refraction commonly practised in geodesy, $(1+c)R$ would be substituted for R in each of the preceding formulae, c being a fraction whose value fluctuates between $\frac{1}{8}$ and $\frac{1}{6}$, according to the state of the atmosphere.

The practical utility of both processes for finding the distance of a light from a ship, and especially of the first, is rendered very doubtful by the great uncertainty and variability of the refraction of light by the atmosphere near the surface of the sea. The degree of precision of which they are capable might easily be ascertained by experiment.

- XIV. Circular:—to be moored by the centre of gravity.
- XV. a. The lines of direction of the cables as they leave the hawse-holes should pass as near as possible to the centre of gravity of the vessel.
- XVI. a. Tall cylinders ballasted so as to float upright; their diameters not to be greater than is necessary to make them sufficiently visible.
- XVIII. A large deep-toned bell.
- XX. Parabolic reflectors to concentrate sound. Parabolic ear-trumpet to find the direction approximately.
- XXII. This question might be answered by collecting the results of observation as to the visibility of existing lights.

15.

- I. WILLIAM AUSTIN, C.E., Errol Cottage, Elm Grove, Southsea.
- II. The improved oxyhydrogen lime light, as adopted by the Universal Lime Light Company, Agents, A. H. Renton, Esq., C.E. See pamphlet printed by H. Hansard, 1859.
- III. Yes.
- IV. Red or green reflectors are best for quick observation.



- XIV. A polygonal or circular iron caisson, with sides serrated or indented rims, so as to form a perfect grip and safe riding on the waves, with a vertical secured position at all times of flood or tide, so that shipwrecked persons could stand on it until succour could be sent from shore.

- XV. a. "Captain Herbert's" plan for mooring from the centre of gravity," with an improved addenda swivel shackle on the mooring chain, to prevent coiling of the chain (similar to a cord on a peg top), and which pulls the buoys under water, as now used, which the shackle swivel would prevent.

- XVI. b. c. The above rough hand sketch is a suggestion for general use and application. It has been seen in plans, sections, and models by practical seamen, pilots, officers, &c. and much approved.

- XVII. Red, green, and white, alternating in succession.

- XVIII. A steam whistle.

- XIX. Blown by regulated times so as to denote the course the ship is supposed to be taking, and responded to by other ship, as understood. Each ship invariably to port helm.

- XXI. Just above the gunwale level.

- XXV. a. By colouring them red, being quickest recognized.
- b. By using the lime light.

16.

- I. WILLIAM HENWOOD, Master Shipwright, Sheerness Yard.

- XIV. The best form for the hull of a floating light would, I consider, be similar to that for a sea-going vessel, which is very fast with the wind aft. It should have the least possible direct resistance, to render the strain on the moorings a minimum; and the least possible rolling and pitching motion, that the light may be steady.

The size of the vessel being given, the proportions of length and breadth should be those of a fast vessel, as above stated, with a flat floor and fine entrance, and the after end to balance the fore, so as to make the longitudinal stability of the fore end not less than that of the after, or about five per cent. greater, to make pitching a minimum.

The suggestion of a "circular form" is indefinite. A cylinder may be regarded as a circular form, but its axis may be either vertical or horizontal, &c.; but such a form would produce great strain on the moorings, and a great motion of the light.

The form for great velocity, with the wind aft, would give stability to sustain the mooring strain, with the least pitching and least strain on the moorings.

Mr. W. HENWOOD.

If an iron vessel be intended, the mooring chain would not be injured by the galvanic action of copper sheathing and sea water, as in a wood vessel.

The upper works should be low, with little overhang of bow and quarters.

- XV. a. I venture to suggest, that if a floating light were moored by a single chain through a hawse hole at the middle line of the stem, and as little above the water as may be, and secured at the middle line of the vessel, low down on the inside, she would ride most easily in all weathers.

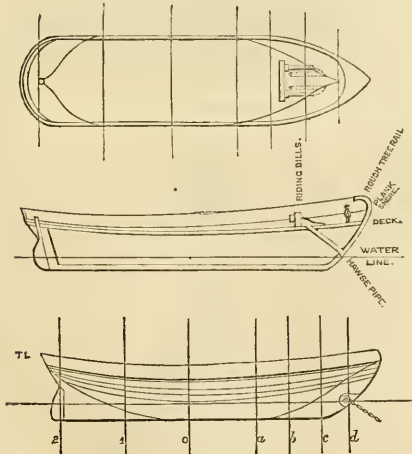
17.

- I. JAS. MACNAB, Gentleman, Cleland Testimonial, 239, Buchanan Street, Glasgow.
 XXIII. See drawing and description sent and marked No. 2. A permanent number of illuminated lettered boxes and boards for disc could always be at hand and marked as follows, for day and night signals—
 "Barometer Rising," or "Falling at ———";
 "Foggy at ———"; "Stormy, S.W. at ———";
 and the different points from which the wind blows in conjunction with the rising or falling of the barometer.
 XXIV. See drawing and description sent and marked No. 2.
 XXV. a. See drawing and description sent and marked No. 1.
 b. Do. Do. Do.

Note.—The drawings sent were considered to be too large for publication; the telegraph described is a pneumatic apparatus.

18.

- I. GEORGE WILLIAM LENOX, F.R.G.S., Assoc. I.N.A., 30, Bedford Square, W.C.
 V., VI., and VII. If not already obtained, I recommend the opinion of Alexr. Gordon, Esq., C.E., &c. &c., 3, Middle Scotland Yard, to be taken.
 XIII. Refer to Mr. Gordon.
 XIV. I consider the best form would be a long flat floor or midship section. A sharp entrance and easy flare upwards, a stern delivery of same shape, of same length, both ends nearly alike, with the exception of the upper works, the deck of which might be spread and rounded astern. See sketch.



My reasons are, a long flat floor would make the pitch to the sea easier and longer, offering less jerk to the moorings; the bow would take the blow of the sea in less body, and the bound upwards, and consequent violence upon the cables, more moderate; the stern upon falling would enter the water easier, and consequently the motion would subside sooner. A round bow and stern

Mr. G. W. LENOX.

keeps up a continual tossing until the swell subsides. The flat floor would be the pivot, and the ends the mere means of breaking the water; thus the moorings would be relieved of much strain and violence.

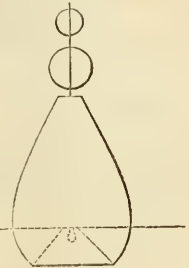
I decidedly think a circular form would prove objectionable, and occasionally give a rotary motion.

- XV. a. I cannot, believing from great experience that no method can be more secure than that at present adopted by the Honourable the Corporation of the Trinity House; and my opinion is supported by the fact that there are now 34 light-vessels moored in every dangerous part of our coast, and notwithstanding the severity of the last winter, not one rupture has taken place since January 1857, when a chain, supplied in 1851 to the Helwick light-vessel, parted, and that the only one, to the best of my recollection, in from seven to eight years.

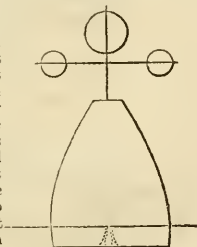
A Belgian light-vessel on the Daerdemarkt bank-moored 12 years uninteruptedly at the same mooring, wore them through and parted during the late gales, and the Government have ordered a new set of moorings on the same system.

- b. In my opinion, the best point of entrance for the moorings is, that when circumstances will admit, which is nearest to the line of floatation, at the fore-foot, because the line of tension is more direct to the fixed point or anchor, and there is less leverage offered by the bow of the vessel over which the chain must pass.

- XVI. a. Beyond all comparison, in my opinion, what is called the Herbert or inverted cone bottom buoy is the best. Its motion is most gentle and easy, as if riding on an elastic cushion. Its principle may be thus described.—Take a tumbler and fill it with water; take a wine glass turned over, place it in the water on its side, that the air may escape from within, hold it erect in the water, depress and lift it, and you will observe a column of water will remain in the wine glass when drawn up, the tendency of which is gently to draw the wine glass again to the tumbler, thus forming an adhesive spring, upon which the buoy rebounds in gentle and easy motion, giving but moderate friction to the mooring chain, little or no pull upon the sinker, and a corresponding relief from agitation or friction to the globe and staff above. They are more expensive than plain made can or beacon buoys, and cost, with the Board of Trade and others, has been the ghost by which the present generation has been scared from consistency, and which has led to cheap and infamous productions, and lately to such frightful loss of life. If expense had not been considered, these buoys would have been universal, and the cheapest by far in the end. They set with least strain upon the moorings, are quite upright when uninjured or free from leakage, and are consequently seen, when built of a bold form, at the greatest distance; the method of mooring, in my opinion, is excellent.



- b. The buoy I should here recommend, where not so much wear exists, is my flat bottomed wrought iron can buoy, with the mooring ring housed in the centre of the bottom; it is an erect, strong, and perfect buoy, and at less cost than the cone bottomed buoy, to which I consider it the next best, and in sheltered situations as good.



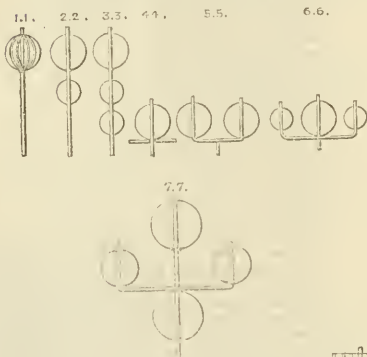
- c. None in my opinion practicable within the reach of our present knowledge of chemistry.

MR. G. W. LENOX.

XVII. This to me is a most essential and interesting point, and I have given it much attention. I addressed a letter upon the subject to the Secretary of the Trinity House, dated the 28th December 1855, and received a reply, dated the 17th January 1856, declining to entertain the project then: since which I have considered the plan could be generalised.

First, I propose all buoys in the British Channel to be painted on the port bow or entrance black, and all on the larboard bow to be chequered in black and white, the whole to be cone bottomed or Herbert's buoys; the first six or out-sea on either side of the Channel to be 11-feet buoys, whose base would carry the proposed signals in any weather; the next line to be eight-feet, and the inner or home to be six-feet buoys.

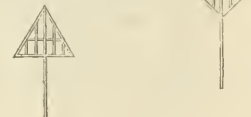
The first on either side to carry a 3 ft. globe on upper end of a vertical staff. The second, on either side, to carry an upper 3 ft. globe, and on one foot below a 2 ft. globe. The third, on either side, a 3 ft. globe, and two 2 ft. globes under, each one foot apart. The fourth, on either side, a horizontal staff, with a 3 ft. globe in centre. The fifth pair of buoys two 3 ft. globes one foot apart. The sixth pair of buoys, a centre 3 ft. globe, and one of 2 ft. on each side, as shown; and if it is desirable to increase the number of distinct signal buoys, I would add one more set with four globes at each end of vertical and horizontal staffs. The smaller or home buoys to carry a 3 or 2 ft. globe only as now; thus, taking the buoys alternately at five miles apart, there would be 70 miles of channel significantly buoyed.



In the St. George's Channel I would recommend the same system; the buoys to be painted red on the port bow, and chequered red and white on the larboard, and the signals to be square cages instead of globes; the design to be the same.

And lastly, in the Bristol Channel the port buoys to be painted a good stone colour (or what is called "in ordinary,") or like Messrs. Blyth's ships, the larboard to be alternate black and stone rings horizontally, and the signals to be lozenges or diamonds;

or triangles



In addition to this organized system, I would recommend a good bell buoy to be placed on all dangerous rocks and sands, and at the entrance of any harbour or place of refuge to be entered at night. I enclose a lithograph of my bell buoys.

XIX. The bell, as worked by a good bell buoy, without shield or housing, beyond a mere cap to keep rain or snow off, letting it verberate on the atmosphere. I would recommend all stationary beacons on land, sands, or rocks to be furnished with a bell to be rung by a weight, which might be wound up once in 24 hours. I have a model.

G. W. LENOX'S PATENT ALARMS AT SEA.

These buoys are intended as "warning beacons" to ships, when approaching dangerous shoals or rocks, or to direct vessels into the mouths of tidal harbours in foggy weather, in dead calms or dark nights, &c. The buoy represented in Fig. 1 and 2, has an undershot water-wheel, internally placed, with an apparatus as shown for ringing the bell; the wheel is turned by the water passing through a trough or pipe, and striking against the lower blades of the wheel, turns it round, and sets the apparatus in motion, so that as long as the tide or current runs the bell will ring; the buoy has a fixed rudder, which keeps the mouth of the water course to the stream in which it is moored as near the danger as possible.

Fig. 3 represents a can buoy moored by the large end, in which are two recesses or chambers, with floats attached to rods passing through tubes in the interior of the buoy, these rods, by the rising up and down of the floats acted upon by the motion of the buoy, sets the apparatus in motion which rings the bell placed on the upper end of the buoy.

Fig. 4 is a small water wheel attached to a frame of iron or wood, to the axle of which is fixed a crank and a rod, which when thrown overboard from a light ship moored in a stream, will revolve as the current runs by it, and ring a bell placed on the taffrail of the vessel; the same can be used by a steamer or other vessel passing through the water on a dark night or fog, and as she drags it behind her, the bell will ring. When not wanted it is unbolted and lifted on board.

Fig. 1.

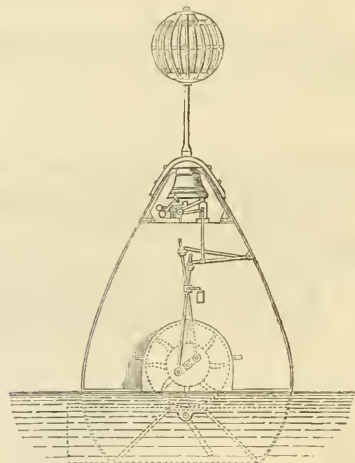
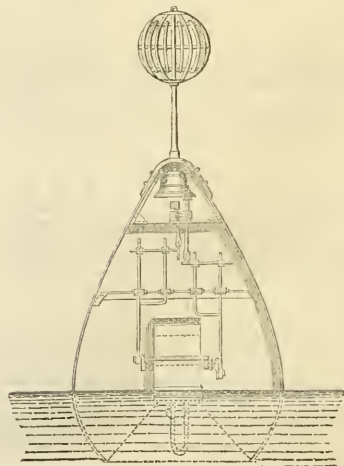
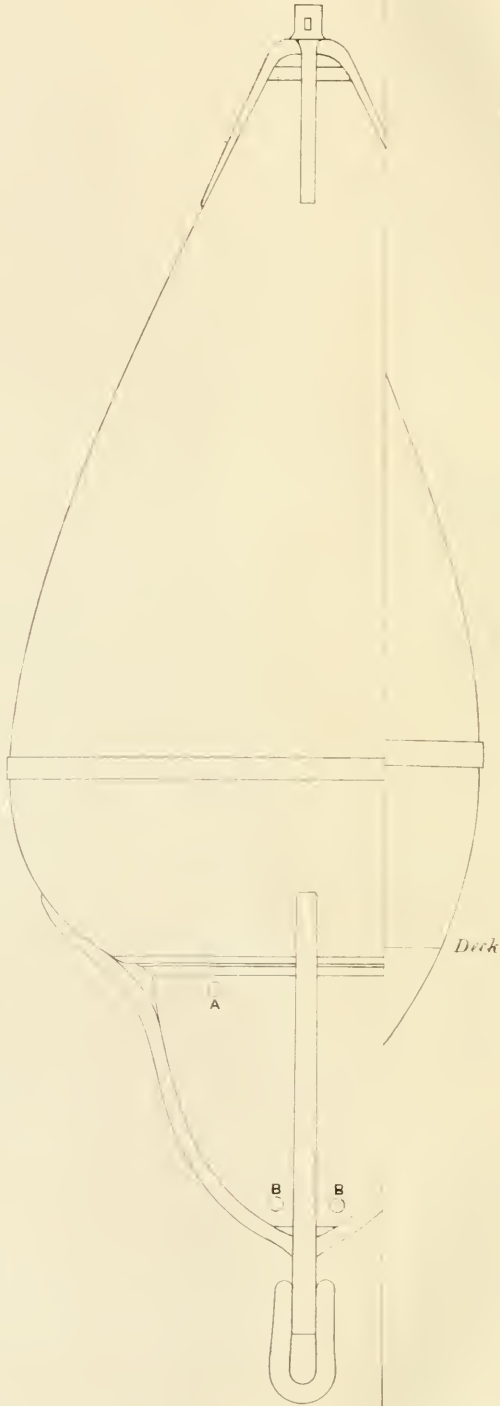


Fig. 2.



Nº 1.



MR. G. W. LENOX.

Fig. 3.

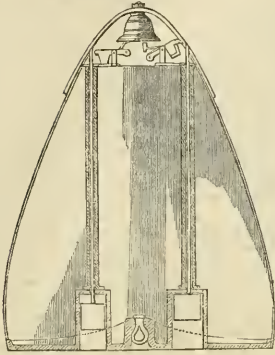
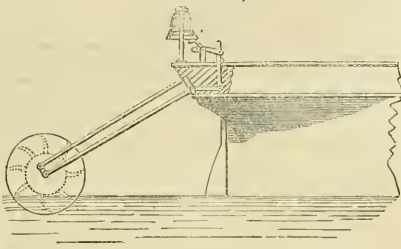


Fig. 4.



30, Bedford Square,
London, July 2, 1860.

Mr. Lenox's most respectful compliments to Admiral Hamilton, and is much gratified by the tenour of his note. B. L. and Co. are not informed where the respective buoys ordered are placed, but Mr. Lenox will obtain the information, and have much pleasure in communicating with Admiral Hamilton. The egg-bottomed buoy noticed by the Admiral is an invention of Mr. Lenox's, of some years past, and followed other schemes of his to get rid of a large quantity of solid ballast required to float, or rather steady, large iron buoys. Mr. Lenox will take the liberty of going more fully into the subject in a day or two, hoping his remarks may be interesting to the admiral. The two Herbert's, viewed in comparison, may have been altered buoys from egg or other bottoms by way of economy (the order of the day), and would not be perfect as his patent, having narrower bases than if first constructed in their proper proportions.

To Admiral Hamilton,
&c. &c.

30, Bedford Square, London, W.C.,
July 6, 1860.

Sir, Reverting to your letter of 29th June, I beg to inform you that the buoy on the Swashway at the back of the Goodwin, that attracted your attention, is a 17 foot egg-bottomed buoy; that on the N.E. Goodwin is a hollow bottomed or inverted cone, called Herbert's, of 20 feet; and that on the S.E. Calloper is a 17 feet egg bottom.

I now take the liberty of adding the following remarks, having reference to the introduction of iron as a substitute for wooden buoys for buoying the channel under the control of the Honourable the Corporation of the Trinity House.

Having for a considerable time had the honour of mounting and fitting the wooden buoys for that service, in 1845 and 1846, it occurred to me that sheet iron would be a very superior material to wood for such purposes, as being more durable, more buoyant, being free from saturation, easily repaired, and not materially affected by the sun or rain, consequently would not shrink or leak, but from violence. In 1845 I proposed the introduction to the Lights Committee, and in January, 1846, I made a barrel buoy of iron, for experiment; being the first it was too strong and heavy, but I believe it exists to this day, and remained

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many years at its berth without removal. In 1846 and 1847 my firm made seven 20 feet cast iron ballasted buoys. In 1848 I was informed by the Committee that the difficulty of transporting these buoys was such, from their weight, that unless I could devise some method of making them swim erect without the ballast, the iron buoy must be given up. Being unwilling to give up my scheme, I begged for time to consider, and it immediately occurred to me, that by decking the structure about one-third from the lower end, and letting the water into the lower compartment, I could dispense with the iron ballast; it was successful. See inclosed sketch, No. 2. It appears that one nun buoy only in 1848 was made upon this principle; that in 1849 two of the cast iron ballasted were converted to water, and then it was discovered those buoys had too much motion; the water, not filling the compartment and having too much space for play, kept up the rolling, when the buoy was set in motion, to an extent that was considered objectionable. I was again consulted, and I suggested making the buoys with round bottoms, and appending an egg-shaped compartment to the centre of the bottom, permitting the water to flow in and out by small apertures; this would confine the water when the buoy was in motion, and form a pendulum; and, I believe, when made to proper proportions, no better buoy can exist when once placed. See sketch, No. 1. From 1849 to 1852 my firm made 22 of those buoys, chiefly 17 feet; but objections again arose, they were troublesome on the decks of the steamers, and thus "Herbert's" plan came into use until the expense was made a difficulty, when I was obliged to attempt the cast iron bottomed buoy as a cheaper substitute. These, I find, are not to be depended upon; and I now make the same shaped buoy, with a thick wrought iron flat bottom, hausing the shackle eye as described in my paper to the Commission. Expense, or rather economy has been the difficulty throughout, and buoys upon one principle have been converted to another, regardless of shape or dimensions, and thus no one good principle has been fairly and judiciously adhered to since iron buoys have been introduced; and although they may be a little dearer at the first cost than wood, they are not one half the cost in the long run. Every change is made under estimate, and thus the contractor is crippled in his endeavours to produce a perfect and efficient floating beacon.

The fact of the egg-ended buoys being superseded, excepting where now placed, was the cause of my omitting them in my remarks to the Royal Commission.

Apologising for the length of the communication,
I have, &c.,

Admiral Hamilton,
&c. &c. GEO. W. LENOX.

19.

I. L'ABBÉ MOIGNO, from "Cosmos,"
March 2 and 16, 1860.

VARIÉTÉS.

Optique, acoustique, et mécanique des Phares.

La commission royale des phares d'Angleterre, composée de MM. Baillie Hamilton (rear admiral), Ryder (capitaine de vaisseau), Hall Gladstone, Duncan Dunbar (président du bureau de marine de Londres), Graves (président du bureau de marine de Liverpool), nous adresse une série de questions, sur lesquelles elle voudrait avoir l'avis motivé des savants les plus compétents; nous nous exprimons de répondre à l'appel qui nous est fait, en publiant son programme dans le *Cosmos*, et lui donnant dès aujourd'hui quelques indications utiles.

OPTIQUE.—*Production de la lumière.*—1°. Pour les phares et les fanaux flottants d'un facile accès, pensez-vous qu'il existe un procédé de production de la lumière, de nature à donner de meilleurs résultats que la combustion de l'huile? Si ce moyen existe, daignez le décrire en quelques mots. On emploie le gaz dans quelques feux de ports; la lumière électrique, engendrée par les machines magnéto-électriques, est en expérience depuis quelque temps à Douvres, dans le phare South-Foreland; d'autres moyens semblables, l'emploi, par exemple, de la lumière Drummond, ont été proposés. Nous engageons vivement la commission à se procurer et à étudier sérieusement l'opuscule de M. Jules Guyot sur la télégraphie de jour et de nuit (Paris, 1840). Elle y verra, par exemple, que pour les petits feux, et peut-être même pour les grands feux, l'hydrogène liquide remplacera avec d'immenses avantages le gaz et les huiles. Mais que la commission le remarque bien, l'hydrogène liquide de M. Jules Guyot diffère essentiellement des

L'Abbe Moigno.

produits adultérés, vendus sous ce nom dans le commerce, et qui ne sont que de simples mélanges d'alcool, d'essence de térébinthine ou d'huile de schiste. Si elle s'adresse à M. Degrand, administrateur général du service des phares français, la commission obtiendra des chiffres parfaitement exacts et très-concluants sur l'emploi économique de la lumière électrique, engendrée par les machines de la compagnie *L'Alliance*, lesquelles, avec une force de deux chevaux donnent directement une lumière équivalente à celle de 200 lampes, et les nouvelles lentilles fondues de M. Degrand donnent directement une lumière équivalente à plus de cinq mille lampes en ciel Carel. 2°. Prenant en considération les difficultés de transport aux phares et aux feux flottants, installés dans des positions isolées, lointaines, très-difficilement accessibles, et le danger qui résulte de l'extinction de ces feux, pensez-vous que le mode de production de lumière que vous proposez puisse être substitué sans inconvénients graves à l'éclairage à l'huile? L'hydrogène liquide, obtenu par la combinaison de trois substances abondamment répandues dans le commerce, peut être préparé sur place, ou peut se transporter sans embarras aucun; la lumière qu'il donne est presque inextinguible. (Voyez la brochure, p. 143.) Les machines magnéto-électriques n'exigent plus qu'un simple transport de charbon, l'approvisionnement ne manquera jamais.

Utilisation de la lumière.—1°. Quel arrangement optique considérez-vous comme le meilleur ou le plus efficace pour envoyer à l'horizon, ou sur un point situé en deçà de l'horizon, pendant de courtes périodes, se succédant par intervalles réguliers ou irréguliers, la plus grande proportion possible de la lumière résultant de la combustion d'une quantité donnée d'huile, ou produite par une autre méthode quelconque? On a employé ou proposé déjà les réflecteurs métalliques et autres, les lentilles polygonales, mécaniquement polies ou fondues, les prismes à réflexion totale, simples ou combinés, etc., etc. Cette partie du programme a été si complètement étudiée par M. Degrand, ses lentilles à échelons fondues et très-minces ont donné de si étonnants résultats que nous ne croyons pas qu'on puisse rien y ajouter d'essentiel. 2°. Quelle disposition optique considérez-vous comme la meilleure pour envoyer d'une manière continue et simultanément aux observateurs situés à l'horizon ou en deçà de l'horizon la plus grande quantité possible de la lumière engendrée? Même réponse, recours à M. Degrand. 3°. Considérez-vous les méthodes que vous avez décrites, comme applicables aux feux flottants, avec ou sans modifications; si des modifications sont nécessaires, veuillez les indiquer ici en quelques mots, ou les décrire longuement sur une feuille séparée? L'hydrogène liquide s'emploie absolument comme l'huile, et beaucoup plus facilement que le gaz. 4°. Daignez nous communiquer les réflexions que vous avez pu faire sur la fabrication des réflecteurs, en y comprenant la matière et la forme, la fabrication du verre, la construction des lentilles et des prismes, l'installation des appareils optiques dans les phares, de manière à obtenir les plus grands avantages possibles, en ayant égard à la position et à l'élevation de la lumière. Faire appel sur tous ces points à M. Degrand.

Couleur.—1°. Pouvez-vous indiquer un moyen autre que l'interposition de verres colorés, pour obtenir, suivant les besoins du service, une lumière de telle ou telle nuance? Cette question nous rappelle que nous aurions dû annoncer et analyser, il y a quatre mois, l'excellente *Chimie pyrotechnique ou traité pratique des feux colorés*, de M. Paul Tessier (Paris, Dumaine, 1859). Il y a longtemps que l'idée nous est venue de demander que sur certaines côtes plus inhospitalières on lance périodiquement en l'air des étoiles de couleurs qui puissent être aperçues de très-loin; or, M. Tessier apprend à fabriquer très-économiquement des bombes remplies d'étoiles de l'éclat le plus vif. 2°. Avez la bonté de rédiger séparément vos avis sur la fabrication des verres colorés, et sur la position à assigner aux verres qui doivent colorer la lumière; on a essayé ou proposé tout à tour l'emploi des cheminées de couleur, des écrans de verre colorés à l'intérieur des lentilles, des lanternes à pans de verre colorés, des combinaisons de cheminées, d'écrans, de lanternes? 3°. Dans votre opinion, quelle est la couleur qui se voit à la plus grande distance, dans tous les états de l'atmosphère, et qui, en même temps, se distingue le mieux des autres lumières colorées et de la lumière blanche? On trouvera dans la brochure de M. Jules Guyot des renseignements précieux sur la lumière considérée comme agent producteur de signaux. Les meilleurs signaux sont ceux qui se peignent en blanc ou en lumière sur un fond noir; les lignes lumineuses sont incomparablement préférables aux points ou cercles lumineux, et nous sommes surpris que l'on n'ait pas demandé encore aux lentilles cylindriques des lignes très-lumineuses; dans la substitution des lignes aux points on gagnerait près de cent pour cent. Après le blanc, les couleurs qui s'éteignent le plus tard, ou à de plus

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grandes distances, sont l'orange, le rouge et le vert; à quelque distance que ce soit, dans la limite de la visibilité, on distingue toujours les verres colorés des verres incolores, alors même qu'on ne peut plus caractériser la couleur; cette remarque, due à M. Jules Guyot, est très-importante et peut-être utilisée dans la pratique. 4°. En cas de brouillard, faut-il que la lumière du signal soit blanche ou colorée, pour qu'elle soit aussi visible que possible? Si la lumière colorée est préférable, quelle couleur faut-il choisir? Dans notre opinion, la lumière émise directement par la source lumineuse est celle qu'il faut employer; car tous les agents de coloration sont en même temps des agents d'absorption et d'extinction plus ou moins grande. Le brouillard absorbera les éléments plus réfringibles de la lumière émise, les rayons violets, bleus, etc., et ne lui laissera que les rayons plus réfringibles, vert, jaune, orangé, rouge; à intensité égale, les lumières vertes, jaunes, oranges, rouges, perdraient peut-être moins que la lumière blanche; mais comment dans la pratique obtenir cette intensité égale? Il y a aussi brouillards et brouillards, le brouillard peut avoir une nuance propre, tendant vers le rouge ou vers le bleu; le plus prudent donc, dans tous les cas, sera de garder la lumière blanche. Si on se décidait à lancer périodiquement des bombes remplies d'étoiles de couleur, il faudrait choisir les nuances les plus vives, et les varier. 5°. Connaissez-vous une méthode à l'aide de laquelle on puisse mesurer la distance à laquelle se trouve une lumière que l'on aperçoit du pont du navire, et vers la quelle on cingle en ligne droite; il faudrait apprécier cette distance dans le cas où l'on connaît la hauteur de la lumière au-dessus du niveau de la mer, et dans le cas où cette hauteur est inconnue? Dès que l'on suppose que la distance à la lumière est assez grande, la hauteur est peu importante. Dans tous les cas, nous sommes certain que le phanoscope de M. Porro, convenablement adapté, permettra de résoudre ce problème d'une manière suffisamment approchée; en faisant appel à notre savant artiste, la commission verra son vœu bientôt rempli.

MÉCANIQUE.—1°. Pouvez-vous indiquer quelques perfectionnements à apporter à la construction des phares à installer sur des points plus ou moins exposés; à la construction des fanaux flottants? 2°. Connaissez-vous quelques perfectionnements à apporter à la construction des lampes, des appareils tournants, ou autres mécanismes employés dans les phares ou pour les feux flottants? Pour les petits feux, nous demandons instamment l'étude et l'essai de la lampe à hydrogène liquide de M. Jules Guyot, parce qu'elle rendrait de très-grands services. Les lampes électriques et les feux tournants ont été longuement et habilement étudiés par M. Degrand; elles sont seules applicables économiquement aux grands feux.

FLOTTAISON.—1°. *Lumière flottante.*—Quelle est, dans votre opinion, la meilleure forme à donner à la coque du navire support du feu flottant? C'est-à-dire quelle forme faut-il lui donner pour qu'il se tienne à l'ancre par tous les temps, dans les positions les plus découvertes, par les marées les plus fortes, les mers les plus houleuses, avec le moins de mouvement ou de déplacement possible, avec le moins de traction possible sur les amarres? Quelques-uns des navires porte-lumière sont plus courts; d'autres plus longs; la coque de quelques-uns est très-renflée; pour d'autres, la coque est plus allongée; quelquefois, en raison des courants et des marées, ils ne tiennent pas tête à la mer et sont agités de mouvements excessifs; on a conseillé de leur donner une forme circulaire et de les amarrer par leur centre de gravité. 2°. Connaissez-vous quelques perfectionnements à apporter au mode d'amarrage des vaisseaux porte-lumière; par quelle partie du vaisseau croyez-vous que l'amarre doit pénétrer; dans quelques cas, les écueils, ou ouvertures d'entrée des amarres, sont à une hauteur considérable au-dessus de l'eau; quelquefois, elles s'effilèvent avec la ligne de flottaison; on a conseillé depuis de les faire descendre au-dessous du niveau de l'eau? 3°. *Bouées.*—Quelle est celle des formes adoptées au proposées pour les bouées que vous jugez la meilleure, la plus apte à se maintenir par tous les temps, dans les situations les plus exposées, par les marées les plus fortes et les mers les plus dures, avec le moins de traction possible sur les amarres, et qui en même temps soit la plus facile à apercevoir? Avez-vous quelques perfectionnements à proposer dans la forme à donner aux bouées, ou dans leur mode d'amarrage? Quelle forme de bouées adopteriez-vous dans les positions mieux abritées? Pourriez-vous indiquer quelque moyen plus pratique et plus avantageux de rendre les bouées lumineuses pendant la nuit? Ici nous déclarons notre compétence en faisant appel aux marins lecteurs du *Cosmos*. Nous redisons seulement que le véritable hydrogène liquide serait un agent parfait d'éclairage pour les bouées. 4°. Pourriez-vous nous indiquer un système généralement applicable, pour indiquer aux navires à l'aide de bouées ou signaux équivalents la route à suivre le long des côtes, dans les ports, les passes ou

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détroits, pour se défendre des roches, des bancs de sable, des bas-fonds; de telle sorte que même sans l'aide des cartes et en l'absence des pilotes les vaisseaux puissent naviguer en sûreté? Si vous connaissiez un semblable système, ayez la bonté de le décrire et de dire un même temps si on peut le réaliser avec les bouées actuelles.

Acoustique.—Quelle nature et quel timbre de son jugez-vous la plus propre à transmettre des signaux à travers le brouillard? Quelle est la meilleure manière de produire le son le plus apte à être entendu de loin? Quel mode de signalement par le son, en temps de brouillard, conseillerez-vous comme le plus avantageux dans la pratique? On s'est servi jusqu'ici de cloches mises en branle par des machines, et de canons; on a eu recours à des réflecteurs ou à d'autres combinaisons pour diriger et condenser le son; on a proposé d'employer des sifflets à vapeur, etc., etc.? Il y a encore beaucoup d'expériences à faire, avant de pouvoir donner à ces questions une réponse satisfaisante. Nous dirons cependant, dès aujourd'hui, qu'un son grave, continu, d'intensité relativement médiocre ou qui soit sans éclat, a beaucoup plus de portée qu'un son aigu, rapide, très-fort. Des éclats de foudre dont le bruit formidable, entendu à proximité, a été quelquefois comparé à la détonation de cent pièces de canon éclatant à la fois, ne se propagent pas à des distances de plus de 16 à 24 kilomètres, tandis que le bruit du canon s'entend quelquefois à 80 et 120 kilomètres. Un timbre de très-grand diamètre, mis en vibration par un archet mu mécaniquement, et dont le son serait renforcé par un gros tube placé en arrière du timbre, mériterait d'être essayé. On pourrait tenter aussi la construction de bouches à feu dans lesquelles des mélanges détonants d'hydrogène ou de gaz d'éclairage et d'air remplaceraient la poudre à canon. M. Marloye proposait de substituer aux plus grosses cloches, même aux bourdons, des triangles d'acier rendant des sons très-intenses et très-graves, sous la percussion d'un marteau. L'adjonction aux cloches de tubes renforçants n'a pas encore été faite, et mérite de l'être, ainsi que nous l'avons dit dans le tome 11. de *l'Annuaire du Cosmos*.

2°. Quel moyen conseillez-vous pour concentrer le son, ou pour l'envoyer dans une direction donnée? Pensez-vous qu'il existe une méthode à l'aide de laquelle les marins puissent distinguer, avec une certitude suffisante, la direction dans laquelle un son est engendré? Les réflecteurs du son, dans notre opinion du moins, sont et seront complètement inefficaces. La seule manière de condenser le son est le tube renforçant, aujourd'hui sans application, et qui aurait, en outre, l'avantage de mieux imprimer au son une direction dans le sens de l'axe du tube. Nous sommes enclin à penser qu'en s'armant des oreilles d'un double stéthoscope semblable à celui que M. Scott Alison a décrit sous le nom de stéthopone différentiel, dans le *Philosophical Magazine* de Novembre 1858, on arriverait à discerner la direction de la source du son d'une manière presque infallible. Il serait important aussi d'essayer le pouvoir conducteur et condenseur de l'eau mis en évidence par les expériences de MM. Colladon et Sturm, et de M. Alison.

3°. A quelle hauteur faut-il placer les signaux sonores des temps de brouillard, pour qu'ils soient entendus à la plus grande distance possible? Nous n'hésitons pas à dire que les sons doivent être produits à la surface de l'eau qui servira de plan réflecteur et directeur; mieux vaudrait encore peut-être le produire dans l'eau, où il serait comme emprisonné. Ajoutons que si chaque station de signal a son son propre, de ton déterminé et connu à l'avance, l'appréciation facile de ce son, à l'aide de boîtes à résonance comme sait si bien les faire M. Kœnig, serait le meilleur moyen de détermination du lieu, origine du son signal.

MÉTÉOROLOGIE.—1°. A quelle hauteur est-il désirable que les becs lumineux soient placés, en général, sur les côtes des royaumes-unis, en tenant compte de ces faits: que, plus la hauteur est élevée, plus est grande la distance à laquelle les rayons parviennent, avant d'être interceptés par l'horizon; que, plus la lumière est basse, moins elle est exposée à être obscurcie par les nuages? Nous pencherions pour une hauteur aussi grande que possible, en raison des brumes ou brouillards qui règnent trop souvent à une faible distance du niveau des mers.

2°. En supposant que la télégraphie optique soit étendue à quelques phares et à quelques vaisseaux à feu flottants près des points les plus saillants des côtes; quelles sont les informations météorologiques qu'il importe le plus de transmettre aux vaisseaux en vue; comment et sous quelle forme ces informations peuvent-elles être reçues et transmises par les gardiens des feux? Les informations les plus importantes seraient évidemment, lorsque le nouveau service sera établi, celles relatives aux ouragans et aux tempêtes apparus dans des parages plus ou moins éloignés, et qui menacent de s'étendre aux régions vers lesquelles les navires

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font voile. Quant au mode de transmission ou de réception de ces signaux, nous ne connaissons rien de mieux étudié que la télégraphie de nuit de M. Jules Guyot.

5°. *Signaux de marées*.— Quel système recommanderiez-vous comme devant être adopté généralement dans les phares ou sur les vaisseaux à feu placés à l'entrée des ports, pour l'indication de l'état de la marée le jour et la nuit aux personnes naviguant au large? Divers systèmes comprenant des ballons, des pavillons, des lumières colorées, des figures illuminées mises en mouvement par le flux ou le reflux, sont aujourd'hui employés ou proposés? Le système de signaux si ingénieux et si efficace de M. Sudre n'a pas reçu, il nous semble, toute l'attention qu'il mérite, et nous le croyons bien préférable aux imitations que nous avons vues mises à l'essai l'année dernière sur divers points, en Angleterre et en Amérique. Nous avons suivi de très-près, à Edimbourg, la manœuvre du ballon installé sur le monument de Nelson, et qui doit simplement signaler l'heure aux vaisseaux des ports voisins; or, cette manœuvre nous a semblé bien complexe, bien absorbante; ne pourrait-on pas atteindre le même but beaucoup plus simplement?

4°. Connaissez-vous, ou pourriez-vous indiquer une bonne méthode de constater l'individualité des phares ou des vaisseaux à feux flottants pendant le jour? Pourriez-vous indiquer quelques perfectionnements au procédé par lequel on s'assure de cette individualité pendant la nuit? Si nous avons bien compris, il s'agit de savoir quel est le phare ou le feu flottant que l'on a actuellement en vue, ou, ce qui revient au même, le point sur lequel le phare ou le vaisseau sont placés. Si c'est bien là la question, nous dirons nettement que la meilleure solution du problème est celle proposée par M. Bahage, l'illustre membre de la Société Royale, qui, par des moyens très-simples, fait signaler au loin, par chaque feu, son numéro d'ordre ou son nom. Nous ne comprenons pas que ce perfectionnement considérable eût été ajourné jusqu'ici, s'il n'était pas trop vrai que nul n'est prophète dans son pays.

Telles sont, à première vue, les réponses que nous croyons devoir faire à la consultation qui nous est adressée. Nous la résumerons en disant que si la commission anglaise tient à s'aider des lumières de la France et de la expérience acquise parmi nous, elle devra se mettre en rapport, pour la télégraphie optique de jour et de nuit, avec M. le docteur Jules Guyot; pour les phares, source lumineuse, lentilles et échelons, réflecteurs avec M. Degrand; pour le télégraphie acoustique, avec M. Wertheim; si elle suit nos indications, elle avancera considérablement sa besogne, et remplira mieux sa grande mission tout humanitaire.

P.S. Les machines magneto-électriques de la compagnie l'Alliance ont atteint une perfection telle, que la lumière électrique est en ce moment la plus intense et la plus économique de toutes les lumières. Le régulateur de lumière électrique de Mr. Serrin, adopté par la compagnie l'Alliance, est aussi absolument parfait, sa lampe s'allume, se maintient allumée, se rallume elle-même sans aucune intervention de la main de l'homme; c'est la solution la plus complète d'un difficile problème.

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20.

I. W. WILKINS and Co., 24 and 25, Long Acre, London, W. C., 1st May 1860.

II. In lighthouses, and floating lights in particular, we do not at present think there is any better method of producing light than by burning oil to the best advantage.

Gas is used in some harbour lights; but at Holyhead Harbour oil has been substituted for gas with the best effect. We do not consider the advantages of the electric light over light from oil to be proportionate to its cost.

III. Considering the difficulty of transport to lighthouses and floating lights in isolated and remote positions, no other known method of producing light can with safety be adopted in preference to oil.

IV. For revolving lights the catoptric principle is the most efficient and the most economical, both as respects first cost and maintenance of 15 reflectors on a triangular frame of five reflectors on each face or side of the triangle.

If the above 15 reflectors have a focal distance of six inches each, and a consequent divergence of 8° instead of 15°, as now in use, we shall have three beams of light thrown out from the lantern, each beam illuminating 8° of the horizon. Now, as each reflector will reflect nearly

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two-thirds of the whole light of the lamp, we shall have from the five reflectors a beam of light of 3.33 (say three) argand lamps, less 5 per cent. lost by reflection.

With the same consumption of oil by the dioptric system, we have eight beams of light, each illuminating 6° of the horizon; but the arrangement of the upper zones, in order to extend the duration of light, increases the actual divergence to 8°, if we consider that the light from the fresnel lamp is equal to 16 argands (which is more than the case), and that the holophotal dioptric apparatus uses up the whole of the light, we shall have the light of two argand lamps in each beam; but as the absorption of light by the dioptric apparatus is 50 per cent. (Professor Faraday, 16th March), we shall have practically the light of one argand lamp in each of the eight beams.

So that for equal quantities of oil consumed we can obtain by a catoptric light apparatus three efficient beams of light, each of them three times more powerful than can be attained in any beam of light thrown out by the dioptric apparatus. The effective power of this beam of light accords with the observations we have made from experiments with a reflector three feet in diameter, and having a divergence of 8°. As respects the relative economy of the two apparatus, the first cost of the dioptric will not be less than 2,000*l.*, while that of the catoptric will not exceed 800*l.*

- V. In our opinion the catoptric system is the most efficient, and where the whole 360° do not require to be lighted, it is the most economical. The Fresnel lamp, which illumines the whole circle, consumes the same quantity of oil as 16 argand lamps, which when used in the ordinary catoptric apparatus illumine two-thirds of the circle. If, therefore, 240° be required to be lighted, it can be in our opinion more efficiently done with the same consumption of oil by means of the catoptric than by the dioptric system, and if the prime cost of the two apparatus be considered, with greater economy. Should 160° of the circle be lighted only, then by permitting 5° of light from each reflector to overlap one other, the 160 will be much better lighted by the catoptric system; but if the reflector be so made as to diverge the light 10° instead of 15°, then we shall obtain a fixed light very far superior to any that the dioptric system for fixed lights is capable of producing.

Our opinion that the catoptric system affords capabilities for greater efficiency in lighthouse illumination than the dioptric is strengthened by Professor Faraday's remark at the Royal Institution on the 16th March 1860, that silver reflects 95 per cent. of the light that impinges upon it when the polish is perfect; but as it is probable the brilliancy of polish which reflectors possess when they leave our manufactory fresh from the hands of skilled workmen is not maintained at every lighthouse, more particularly in the colonies, we have, after many trials, at length succeeded in devising a simple mechanical arrangement which shall maintain the high polish referred to, and which is not improbable that the catoptric system has not met with its deserts, in consequence of the want of the necessary polish.

21.

DE VILLE and Co.

CIRCULAR No. II.

- I. The knowledge of both these particulars, if properly employed, might be made much use of in increasing the efficiency of the light exhibited, by extending a beam of otherwise insufficient dimensions, or by contracting and thereby increasing the power of one uselessly diffused over a space not required to be illuminated.
- II. It would certainly be important that the information be furnished before any of the work were commenced; but, although the manufacturer could turn the information to its full account, we are of opinion that the shape and relative positions of the lenses, prisms, &c., should be determined by the engineer into whose hands the whole matter was intrusted.

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- III. A table to provide for all probable changes of the two conditions referred to would, we think, be somewhat complex; but it could, without doubt, be prepared, and would be of the greatest possible service, inasmuch as without some such standard, each engineer or manufacturer might effect the same result with a different combination of the shapes and positions of lenses and prisms, and thereby lead to confusion instead of system, as would be desirable.
- IV. We are not aware that any such information has been hitherto furnished to manufacturers. Fresnel's system of dioptric lighting apparatus having been adopted, an apparatus of which casts a nearly parallel beam of light, and does not provide for the contingencies of height, or of a necessity to illuminate any particular horizontal arc, thereby rendering any such information (had it been given) superfluous.

22.

JAMES T. CHANCE.

CIRCULAR No. II.

- I. *a.* Yes. The apparatus should generally be so adjusted that the rays from lines in the flame through the respective foci of the prisms and lenses shall constitute the light seen at the farthest distance. This adjustment depends upon the elevation of the apparatus.
- b.* Yes. The maker might frequently suggest improved arrangements, especially for the purpose of making use of that part of the flame which is towards the arc of the horizon not required to be illuminated.
- II. This information need not affect the prisms and lenses. The required adaptation can be perfectly accomplished by *inclining the prisms, and depressing the lenses*, in their respective metal frames to a *very slight* extent, varying as the square root of the elevation: the lenticular panels ought at the same time to be inclined outwards, so that the focus of the lenses shall remain in the same point of the flame as before the lenses were depressed.
- III. Yes; but no maker ought to require any such table. (I do not see the applicability of any table to different horizontal arcs.)
- IV. No.

23.

- I. ALAN STEVENSON, LL.B., F.R.S.E., lately Engineer to the Lighthouse Board in Scotland.
- II. There are a few situations near to towns in which gas might be used, especially in dioptric lights, whether fixed or revolving; but its application to catoptric illumination would apply only to fixed lights. As to the oxy-hydrogen and magneto-electric lights, my own experience gives me no means of offering a decided opinion. (My Rudimentary Treatise on Lighthouses, p. 60, Part I.)
- III. My own experience leads me to reject any mode of illumination but oil for lights in difficult and inaccessible situations.
- IV. There can be no doubt that the polyzonal lenses invented by Buffon and Condorcet, and again by Fresnel, who re-invented them, and first applied them to lighthouses, are the best instruments for revolving lights; and more especially is this true when their effect is extended beyond the simple dioptric action, by means of catadioptric zones of a curved form, concentric with the zones of the lens, and removed behind them so as to intercept the rays which would escape above and below the lenses. This arrangement was first suggested by Mr. T. Stevenson, and used for a first class light at North Ronaldsay, in Orkney.
- V. The dioptric arrangement of Fresnel with diagonal joints, or rather helical joints, [like those first used in renovating the Isle of May light in 1836], is by far the most suitable, and seems the only one capable of fully meeting the requirements of a fixed light on a large scale.
- VI. I have never had that subject under my particular consideration.

MR. A. STEVENSON.

- VII. *d.* I strongly recommend the use of *diagonal* framing for the lanterns instead of *vertical*, as the light is thus equalized in every azimuth. This was first done, on the large scale, at Noss Head in Caithness (Account of Skerryvore, p. 330). (See also p. 320, as to the masking of lights.)
- X. I know of no colours except *red* and *green* which can be used with advantage.
- XI. I know of none that would be of the slightest use in practice.
- XII. I think stone buildings should always be preferred. All experience goes to condemn the use of iron in exposed situations, which must daily deteriorate in its strength and in its fixtures. For such purposes I think *weight* a far more legitimate source of stability than *strength*. (See my Rudimentary Treatise on Lighthouses, p. 55, Part I., and 180, Part III., also Part I. p. 25, et seq.)
- XVIII. I have no great confidence in any mode of employing sound, either with the expectation of condensing or directing it.
- XXII. I think there is rarely much need to seek a higher elevation for the lights than 150 feet.
- XXV. *b.* I decidedly prefer the mode used in Scotland to that based on minute subdivision of time. Upon this subject much ingenious but useless speculation has found favour with persons unacquainted with practical seamanship.

24.

I. THOMAS STEVENSON, F.R.S.E., President of the Royal Scottish Society of Arts, and Joint Engineer to the Board of Northern Lighthouses.

II. In the present state of our knowledge I am not prepared to state that there is any better source of light than oil.

IV. The most perfect is that in which the revolving lenses of Fresnel are combined with the totally reflecting holophotal prisms which I proposed for light-houses in 1849. The first application of total reflection to *revolving lights* was adopted at Horsburgh, near Singapore, in 1851, and afterwards on the large scale at North Ronaldsay.

Since 1851 I have used for lights of a small scale, as at Morecambe, &c., annular lenses cast in one piece having the curved surfaces of the central part and also of the outer rings unground and unpolished.

I do not, however, think that for sea lights any plan, however cheap, should be adopted which intercepts any considerable portion of the rays which would have been usefully transmitted had the surfaces been polished. The full effect of the oil consumed should not be diminished by the interposition of apparatus of second rate quality, by which the seaman is in perpetuity deprived of a portion of the rays proceeding from the combustion of the oil, for the whole of which he has to pay; and though stamped lenses and reflecting prisms, may, as I understand has been done in France by M. Degrand, be made much thinner than those which are ground and polished, and may thus prevent much absorption of light, still I should fear that their surfaces would be inferior in polish and accuracy of form, thereby causing irregular dispersion. It is proper to state, however, that I have not seen any of the French cast lenses, which are probably very superior in quality and in other respects to the small ones made for me in this country for harbour lights.

V. The fixed dioptric light of Fresnel, as used in the northern lighthouses, with diagonal framed lantern, is the most perfect fixed light apparatus that I am acquainted with. When the light does not require to be seen all round the horizon, or it equal strength in every azimuth, I recommend what I have called the *azimuthal condensing light*, by which the light can be so allocated as that its power in different azimuths shall be proportioned to the distances that the light is expected to be seen in those azimuths. This arrangement was proposed in 1855, and introduced in 1857 at Isle Oronsay and other Sound lights, where a great saving of oil has been effected.

MR. THOMAS STEVENSON.

VII. *d.* The apparatus in nearly every case may be placed with its axis truly horizontal, but in very high lights the lenses, &c., should be made to dip till their axes intersect the horizon line.

IX. The red chimneys used in the Northern Lighthouses are first made of white glass, and then stained red, but Messrs. Stevenson have lately been experimenting on some blown directly from red "metal" at Messrs. Chance's works, which have answered remarkably well, and are expected to be very considerably cheaper.

a. Red chimneys have been long used in the Northern Lights' service for argand burners, and experiments have just been completed by Messrs. Stevenson on similar red chimneys for *four-wicked* burners, the results of which are quite satisfactory. When the light is to be all red the chimney is the best agent, but when the light is to change from one colour to another in certain azimuths, the coloured medium must be removed as far as possible from the radiant to increase the sharpness of the "cut off." When plate-glass can be procured of the proper tint, sufficiently thick for *glazing the lantern*, it is much to be preferred.

X. *a.* In the order of their visibility white, red, green, blue; but the green, and especially the blue, greatly diminish the power of the light, and should be very sparingly employed.

b. If the radiant be of the same power, white light is certainly the best, as though a fog has the property of imparting a reddish tinge to white light, it probably never obstructs all the other rays of the spectrum. If, on the other hand, the *red light* be of the same intensity as the *white light*, the advantage is on the side of the red light, as I understand has been proved by M.M. Reynaud and Degrand by experiments.

XI. I do not know any satisfactory method.

XII. In certain circumstances a revolving light may be made azimuthal condensing when the light does not require to illuminate the whole horizon; the power being increased in the required directions by applying mirrors, which are made to move when they come to the dark or landward part of the lantern, where they will alter the direction of the rays; but this arrangement is not capable of being adopted in all circumstances.

I beg to refer to the drawings of beacons and lighthouses which have been furnished by the Northern Lights Board to the Royal Commissioners.

XIII. I believe the lamps, &c., in the Northern Light's service to be constructed on the best known principles.

XVI. *c.* The most promising method that I know of is to direct a powerful beam of light upon them from some station on shore; the buoys might also be furnished with reflecting or refracting agents.

In experimenting lately on an apparent light proposed for illuminating an inaccessible beacon, a powerful beam of very slightly divergent light was produced by glass prisms, which were more than *half-a-mile* distant from the source of light, which consisted of a large annular lens, illuminated by a single argand burner only one inch in diameter.

XVII. The first proposal for this purpose that I am aware of is that by Captain Bedford, and adopted and extended by Mr. Alexander Cunningham, and referred to in his report to the Commissioners of Northern Lights in 1858. My impression is that the system of adopting four colours to represent the cardinal points of the compass, as was at one time proposed by Mr. Cunningham for offshore dangers, is the best system, and should be extended to all buoys, and to beacons also, whether they be placed in rivers or at sea. The intermediate bearings could be indicated by stripes of two colours, or otherwise.

XVIII. I am unacquainted with any satisfactory method of employing sound.

XX. I know of no way of enabling the mariner to tell with accuracy from what direction a sound comes.

XXII. On the Scotch coasts, especially, if in the neighbourhood of high land, I think it is not desirable to exceed a height of about 200 feet.

Mr. THOMAS STEVENSON.

- XXIII. The only intelligence I can think of is the occurrence of storms at other parts of the coast, but I think it would be difficult to communicate with ships at sea.
- XXIV. Mr. Alexander Cunningham's code seems to promise well.

CIRCULAR II.

I. It is absolutely necessary that the information alluded to in the accompanying queries should be obtained previous to the construction of the apparatus. In our experience we find that the arrangement of almost all lights (especially those in Sounds, and in cases where the lenticular apparatus has, in order to produce its maximum effect, to be combined with auxiliary agents), involves the fulfilment of optical requirements peculiar to the locality which cannot be dealt with by the manufacturer, and which, if neglected, may very seriously impair the utility of the light to the mariner. Moreover the Commissioners of Northern Lights, and others whom we advise as to the erection of lighthouses, contract by tender for the construction of the apparatus. In order, therefore, that all offerers may base their tenders on the same data, and so engage in a fair competition, it is absolutely necessary to furnish them with a *plan and specification of the work to be performed*. The plan and specification embrace the information referred to in the queries, so that the only duty of the manufacturer is to see that his own department is fulfilled, and that the work is executed in terms of the specification. Without such a plan and specification it is not possible always to secure good work, and it is not at all unlikely, when there is no regular plan and specification, that a high price has to be paid for inferior workmanship, without the power of being able to check it. Further, we have often, even with a specification and plan, had occasion to reject, in whole or in part, apparatus furnished by the most respectable houses, which, without the plan and specification as a standard of reference, we could not have insisted on, but must have been contented to take the contractor's explanation of what he conceived to be the quality of work required, and on which vague conception he had made his offer.

A light has often to be cut off, or its colour changed, or its intensity increased in different azimuths, all of which must be considered by those who design the light, and the desired effect can only be attained by actual trial and adjustment of the light itself as viewed from the sea, which obviously cannot be intrusted to the manufacturer.

From what we have said it will, therefore, be seen that we do not consider that it would either be economical or desirable, or even in many instances possible, to intrust the manufacturers who offer for the work to arrange its details and style of workmanship, and therefore we conceive that the proper course, in order to ensure the best workmanship at the lowest cost, is that which we invariably follow, viz., to take all such details as those specified in the queries into consideration when preparing the plans and specification which regulate the carrying out of the contract between the parties, and in terms of which the different contractors make up their offers, and thereafter execute the work.

Note as to Apparatus for the Electric Light.

Having never had an opportunity of seeing the magneto-electric light I shall not attempt to give any design for its apparatus, but I think it right briefly to describe certain optical instruments some of which may be useful for lights, such as the electric, which, from the small volume of the radiant possess very small divergence.

Where additional horizontal divergence is required for revolving apparatus, I would recommend the spherico-cylindric lens which I proposed for lighthouse illumination in 1856. Where, from the tower being elevated much above the sea, increased vertical divergence is also required, I would propose, as probably a better arrangement than merely depressing the spherico-cylindric lens, a new form which might be called a *differential lens* from the property it possesses of allowing the amounts of vertical and horizontal

Mr. THOMAS STEVENSON.

divergence to be adjusted in any required ratio. One side of this differential lens, vide figs. 1 and 2 (in which the curves, for the sake of distinctness are purposely exaggerated) would resemble Fresnel's lens in having surfaces curved spherically, while the other side, instead of being plane, would be ground to a double curvature, the one horizontal to produce the necessary azimuthal divergence, and the other (fig. 1.) vertical to give the necessary dip. In fixed lights the central refracting belt may be corrected for dip by a slight vertical curvature on the inner side.

Fig. 1.

Fig. 2.

As it is probably impossible to give any additional curvature to the totally reflecting portions of the apparatus, the rays, after passing through the ordinary apparatus, might pass through *differential refractors* placed in front. One face of each refractors (figs. 3 and 4) would be straight vertically and ground to such a curve horizontally as would give the incident rays the required amount of azimuthal divergence, while the other face would be straight horizontally, but would be curved vertically so as to give the necessary amount of dip. Similar refractors, circular in plan and curved in the vertical section to give the required dip might be constructed for fixed lights, or to dispense with an additional refracting medium the glass panes of the lightroom might be so as to answer the same purpose the horizontal curvatures being omitted. These refractors might have different curvatures so as to allocate the quantity of light to be sent in different vertical sectors proportionally to the distances from which the light requires to be seen in such sectors.

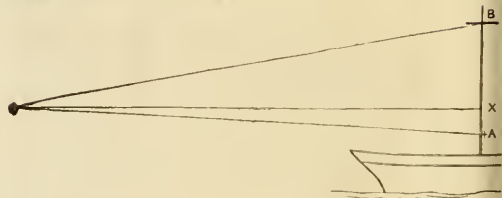
In azimuthal condensing lights, whether fixed or revolving, the straight prisms which form part of the auxiliary apparatus might, where the height of the tower renders it advisable, easily be ground for the dip to a vertical curvature on one side.

g. 3.

Fig. 4.

25.

I. JAMES R. NAPIER, Glasgow.



XI. Let O be the light and A B the mast of a vessel approaching the light, A being near the deck and B anywhere up the mast, the higher the better, where it is convenient to make an observation. The angles B A O and A B O being found by observation, and A B known, the distance C X can be calculated. I believe that the free revolver of Professor Piazzi Smyth of Edinburgh will measure the angles A and B with great exactness. Apply to him for information.

XIV. The larger the ship the steadier the light; therefore if the lights are not sufficiently steady at present increase the ship till the required steadiness is attained. Anchors and cables can be made sufficiently strong to ride the largest ships in all weathers.

The smaller the ship the less the strain on the moorings.

MR. JAMES R. NAPIER.

I conceive that a vessel whose length is about five times its breadth, bow and stern lines alike, and both sharp, circular bilges with radius about one-third of the beam, flat bottom, no keel, and draft of water about one-third of the beam, will produce less strain on the cables in all weathers than longer or bluffer vessels of the same displacement.

Spherical lightships or floating bodies moored by their centre of gravity will require heavier anchors and cables, and will pitch more and roll less than a vessel of the same displacement formed as above.

See a paper in the Philos. Transactions, 1850, on the Dynamical Stability and Oscillations of Floating Bodies, by the Rev. H. Moseley. My best answer should have been, put Moseley's theory in practice.

- XV. *b.* The moorings should enter the vessel about the level of the centre of gravity of the ship when the lights are up.

The times of rolling and the angle of rolling can then be more easily adjusted by ballast, &c. Close to the water is, in my judgment, much better than at a considerable height above it.

- XIX. Make the gongs, bells, guns, steam whistles, &c., large enough.

26.

- I. JAMES COPCUTT, 26, Kirby Street, Hatton Garden, London, and of Aylesbury, Chemist.

- II. Yes, by Fitzmaurice's domestic or olefant gas,* which is useable with any of the common gas fittings, and with or without compression. The gas is made from oil or grease, which may be enriched with unrefined or other camphor. The very same apparatus used to make this gas from oil, &c., will do for coal gas. Lime wicks are not used for this gaslight.

By Fitzmaurice's (Coppett's 2nd Patent) oxy-olefant gas light,† which is made by oxygen gas, olefant gas, and a prepared lime wick.

N.B.—Either of these lights may be seen at Conway Lodge, 12, Hyde Park Gate, W.

. (See Coppett's pamphlet on these lights. Hebert, Cheapside; West, Newgate Street.)

- III. Yes.

- IV. Fitzmaurice's new argand olefant gas burner placed in focus of a shallow reflector, revolving or concentrically within lenses for dioptics.

The oxy-olefant lime light also is applicable, with reflectors or dioptics, or without either.

- V. Either Fitzmaurice's new argand olefant gas light or the oxy-olefant lime light, fixed in focus of reflectors placed around the lantern inside.

- VI. Yes.

- VII. *d.* Burners placed (some in vertical triangle) as near as practicable to the lantern glass, both for light and temperature. Snowtoims, ice, &c., are thereby counteracted better.

- IX. *b.* Coloured glass placed in centre of rays near but outside of reflectors, lenses, &c.

- X. *a.* Rose red.

b. White with rose red centre.

- XIV. Rhombus, moored by the centre of the stem.

- XVI. *a.* Double cone.

c. Copper top, electro-gilt, and burnished cones or spheres would be very visible objects at night.

- XVII. Systematic diversification of buoys, viz., colour, shape, size, and character in accordance to depth, &c.

MR. JAMES COPCUTT.

- XXIV. Separate light, signal or flag vertically adjustable above, level to, and below the lantern, according to height of tide, which tide would give the motive power.

- XXV. *a.* Alternate white and red colour painted on the lighthouse or vessel.

- b.* More signally brilliant lights, as proposed herein, fitted with the various colours, or alternately with colour.

Note.—The lights referred to in this paper were shown to the Secretary.

The lime light did not appear to him to vary materially from other lights produced, as this appeared to be, by an oxy-hydrogen flame impinging on a surface of prepared lime.

The gas said to be produced by the destructive distillation of oil seemed to burn well and to be easily made. Its comparative cost was not stated.

It can only be determined by experiment what advantage, if any, would be gained in lighthouses if the oil there consumed were converted into gas in a retort instead of the ordinary lamp. In any case oil is converted into gas in the process of burning, and this double method of burning oil seems to add the difficulty of storing that gas, which in common lamps is produced above the wick and consumed as fast as it is produced.

Something might possibly be gained in lightships by using gas, so as to avoid the shaking of the liquid oil in the lamps consequent on the movement of the vessel.

What would be the result of mooring "a rhombus by the centre of the stem" is not explained by the projector of this plan.

It does not appear how electro-gilt cones would be luminous or reflect much more light than water.

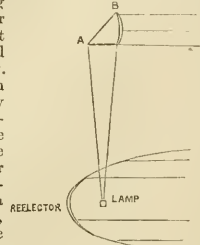
The buoyage system proposed appears to require further explanation.

27.

- I. W. H. MILLER, Professor of Mineralogy in the University of Cambridge.

- IV. In most situations the light is not wanted all round the horizon. During the time that the light is directed landwards it is in a manner wasted. In such cases would it not be better to make the reflector oscillate through the angle in which the light is required, instead of revolving all round? The intervals between every alternate appearance of the light would be equal; the intervals between every successive appearance unequal, except at the middle of the angular range of the light. This, the bearing of the light from a ship being known, would serve to identify the light.

- XI. If a reflector A B could be placed at 10 or 20 feet above the lamp, revolving with the mirror or lenses, a faint light would be observed above the bright light. The angle between the two measured by sextant or "coming-up glass" would give the distance of the light. The reflector might be a right-angled prism, or a number of them, having one surface ground convex, so that the lamp should be in the focus, like the right angle prism used in the construction of a camera obscura.



- XIII. In some cases it might be advantageous to make the reflector oscillate instead of revolving.

* 80 feet per hour permanent gas, and 3 lbs. fine dry lampblack (fit for paint or printing-ink) are easily made in a stove 8 feet square from 1 gallon of pine oil, costing 6d., to which oil, 1 oz. unrefined camphor may be added, to further increase the brilliancy of this rich gas light. The colza or the animal oils yield 120 feet of gas per gallon.

† N.B.—No lime wick or vitriol is used for this gas light, nor is any purification necessary when made from oil or grease. Six feet per hour give the light of 80 candles.

* Oxygen gas is made from 8 parts chlorate of potash to 1 part oxide of manganese. No oil of vitriol is used for this lime light.

By aid of a reflector the oxy-olefant lime light would be visible at a distance of 100 miles and it has shown the true by a watch a mile off.

28.

Mr. S. BARRASS.

I. S. BARRASS, C.E., 5, Culford Grove, De Beauvoir Town, London, N.

XI. An instrument may be made to determine the distances of lights as soon as they are visible and irrespective of their height, on the geometrical principle that the angles at the base of an isosceles triangle are equal, and on the optical principle that the angles of incident and reflected rays are equal; thus, let an instrument be constructed with a fixed reflector and a movable one, the latter having an arm or lever with a graduated scale and vernier, and a magnifier for reading off as in the quadrant, or the index glass may slide at right angles to the axis of vision, and then equal divisions of the scale and vernier will represent equal distances from the observer, the horizon glass being silvered half way up, and having a small telescope to assist the sight, in the usual manner of optical instruments for taking observations.



XII. *a.* I beg to draw the consideration of the Royal Commissioners to a means of constructing lighthouses in exposed situations, and applicable to many where floating lights are now moored, it being premised that a lighthouse will always be preferred to a floating light wherever it is possible to substitute the one for the other.

This means is by sinking large wrought-iron cylinders or caissons in the position required, excavating the interior until a good bottom is found, or a foundation formed, filling up the void with concrete, and then erecting thereon a stone or iron tower according to the funds at command, stone forming an unexceptionable tower, but iron offering a cheaper course of construction, while the caisson may be carried 20 or 30 feet above high water level, and form a breakwater to protect the tower in rough weather, and in fine weather a terrace for the recreation of the keepers, while, if necessary, it might be made an element in the means of rescuing life from shipwreck.

The writer endeavoured some ten years ago to draw the attention of the authorities concerned to this proposition, but the sinking of cylinders for foundations was then, comparatively speaking, in its infancy, nothing had been attempted beyond cylinders of six and seven feet diameter, while Dr. Pott's experimental beacon at the South Calliper Sands had but recently proved a failure, a failure which might have been anticipated, seeing that the cylinders were merely stuck in the sand and had no foundation. Now, however, by the introduction of the system of working and excavating under a pressure of air, using the cylinder as a deep diving bell, exposing to view the whole area of the bottom, and so offering ever facility for procuring a good foundation, the probability of failure, if the works are properly and cautiously conducted, is exceedingly remote.

The wrought-iron caisson for the centre pier of Saltash Bridge is sunk to a greater depth than would be required for a lighthouse in the position of the Gull Stream floating light, its diameter is nearly enough for a first-class tower. The cylinders for the bridges recently erected over the Nile are sunk from 90 to 100 feet below the water level.

The Gull Stream light is moored in 54 feet, the bottom sand and shingle, the nearest chalk soundings 62 feet, no doubt the solid chalk formation as in the adjacent coast. The South Sand Head Light is 84 feet, nearest chalk 95 feet. The North Sand Head Light is 60 feet, chalk probably at 75 feet. The Nore Light in about 30 feet, and the two Formby Channel Lights and the North-west Lightship in about 40 feet.

There is every probability that in any of the above positions, where the sands and channels are sufficiently permanent to justify the erection of a tower, a lighthouse could be erected, the ultimate

possibility being determined by sinking a small experimental cylinder to see if a bottom can be found or a foundation formed at a depth which can be reached by the workmen.

b. The above system is believed to be eminently adapted for beacons in sands, silts, or loose earthy bottoms in exposed situations; a series of small cylinders may be sunk until each is properly placed on a foundation, then filled with concrete and braced together in the superstructure.

XVI. *a.* Buoyage.

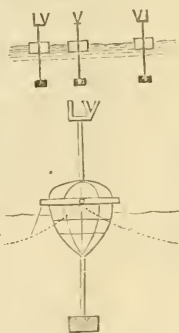
The forms of buoys in present use, and those proposed which have come within the cognizance of the writer, are ineligible for the purpose intended, their excessive motion rendering any distinctive mark upon them (when visible at all) impossible of identification.

I beg to suggest that buoys be constructed of two separate but integral parts, one part to give flotation to the entire mass, and another part to always stand vertically (or nearly so) and be the signalling object.

This I propose to effect by having an aperture in the centre of the floating part (which may then be a right lined figure instead of a peg-top form), through which to pass and hang in swivels, the vertical part, which is to form the signal, passing it into the water a certain distance and weighting it at the bottom to keep it steady and vertical, and allowing it to stand above the water surface, say 15 feet or other suitable height, according to circumstances. The method of mooring should be with three chains.

b. The above description of buoy is believed to be equally eligible for sheltered situations.

XVII. Yes. I beg to suggest that on the top of the afore-said vertical signalling part of the buoy there be fixed large block Roman numerals, say 10 feet high, indicating the depth of water at that point as fathoms of water, while rocks and shoals might have their initials fixed; the buoys being so moored that they cannot turn round and present the edge of the letters or figures. Could be applied to buoys now in use.



XIX. A bell, similar to those of clocks and alarms, but of sufficient magnitude to be heard one or more miles.

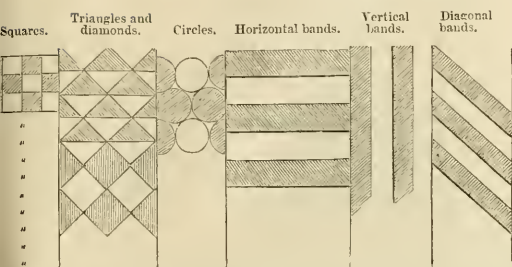
XX. Placing the bell in the focus of a paraboloidal reflector, Yes; making the bell to revolve and strike a given or certain number of times in one revolution, when the maximum and minimum or varying intensities of sound would indicate the line or direction of the signal.

XXI. The surface of water is probably (if not absolutely) the best conductor of sound, and a fog signal should therefore be placed on a separate gallery (instead of the gallery around the lantern), and as near the surface of the water as is practicable, having due regard to the height which heavy spray may be thrown during the period of fogs, say about 30 feet above Trinity datum or high-water level.

XXV. A good system of identifying lighthouses and floating lights by day may be effected by colouring the body of the tower of the former and the side of the hull of the latter in large patterns, consisting of the three simplest geometrical figures,—the square, the triangle, and the circle, with the three primary colours, red, blue, and yellow, together with black and white. Floating lights having their mass signals agreeing in shape and colour with the pattern on the hull.

Mr. S. BARRASS.

The following are the distinctions which could be very easily and palpably effected.



Colours:—Black; Red; White; Blue; Yellow; Black and red; Black and white; Black and blue; Black and yellow; Red and white; Red and blue; Red and yellow; White and blue; White and yellow; Blue and yellow.

$15 \times 7 = 105$ distinctions.

29.

The Secretary of the Royal Commissioners on Lights, Buoys, and Beacons.

HONOURABLE SIR,

April 30, 1860.

I BEG most humbly to request that you will be pleased to lay before the Royal Commissioners my plans for improving buoys, which I have enclosed. The defect in bell buoys at present is that they depend on rolling motion, and in calm still foggy weather they do not ring and their object is lost. To remedy that defect I propose tide-working bell buoys, which could be fitted so as to be distinguished in foggy weather in such passages as the Needles. A buoy on one side could ring three bells, each bell distinguished by its different tone. A buoy on the opposite side could ring one bell, which would be a guide to the passage, however foggy.

I have submitted three distinct plans, and hope that one or the other may render intricate passages less dangerous to navigate in dark or foggy weather.

I beg to submit to the Honourable Commissioners that the plan could be applied to lightvessels, so that in foggy weather the man on the watch, by moving a lever, could set it in motion and ring one or more bells or gongs, which would ensure their ringing without depending on manual labour.

I shall deem it an honour to give any further information in any way that the Honourable Commissioners may be pleased to direct.

I have the honour to be,
Your humble obedient Servant,
JAMES EALES.

Residence—13, Central Street, Landport,
Portsmouth, Hants.

(See diagrams, p. 612.)

30.

G. MAGNUS, Berlin. (Translation.)

V. If there be placed before a lamp, or any other source of light, at the focal distance, a cylindrical lens which is bounded by one plane and one cylindrical surface, or by two cylindrical surfaces, the axes of which are horizontal, the rays proceeding from the source of light in a vertical plane perpendicular to the axis of the lens, are parallel to one another. If we now suppose the lens curved so that it stands at the focal distance in each vertical plane that passes through the source of light, the rays proceeding from the lens so curved fill a space which is bounded above and below by parallel surfaces, and on either side by planes which pass through the source of light and the vertical edges of the lens. If the lens be so placed that these rays stretch away over a part of the surface of the sea, the light is visible to all vessels that arrive within that space. It will not be possible with a single lens to illuminate a very large surface of the sea; this object can be attained only by means of several such lenses, placed over

Mr. G. MAGNUS.

one another in two rows in such a manner that those of the upper row should be situated above the interstices of the lower, somewhat as the drawing shows. It is self-evident that then each lens, or at least each row of lenses, must have its peculiar source of light, and that the two rows must be inclined somewhat differently.

Such double curved cylindrical lenses, if they do not require to be too much curved, might be made according to the following method given at VII. c.

A strengthening of the light might still be attained by the placing of concave mirrors behind the plane of each lamp. It is superfluous to mention that these must be brought into such a position that the flame is in the central point of the mirror.

VII. c. Lenses may be constructed of sheets of glass fixed together, between which water or some other fluid is placed. In order to give the necessary curvature to the well ground and polished sheets, there must be prepared in iron a segment of a sphere of the size and curvature which the lens should receive. This segment is placed in a great muffle, or a suitable reverberatory furnace, the sheet of glass is laid on it and heated till it becomes soft. Thus it sinks down on the spherical segment, and takes its form, especially if the curvature be not too great. Two sheets thus curved, or one curved and one plane, may be adjusted with their edges in a setting of metal, and the space between filled with water or some other fluid through an opening in this setting. Since at present very large sheets of glass are prepared, very large lenses may also be obtained.

XVI. c. For the illumination of buoys at night the electric current may be employed. The buoy must either be wholly of glass, or it must carry a water-tight lantern, which always assumes the highest position as well when the sea is high, as at its ebb and flow. Into this lantern must be hermetically fixed a cable containing two wires, through one of which the current flows to the buoy, and through the other back from it.

The so-called electric or coal-point light is on various grounds not applicable. But a fine platinum wire stretched between the two conducting wires may be maintained at a white heat by a constant current; or, what is better, an induction apparatus may be employed, and by means of it a Geissler's tube may be rendered luminous. If the rarified space through which the stream passes in such a tube is of very small diameter, the light that this space sheds abroad is of extraordinary intensity.

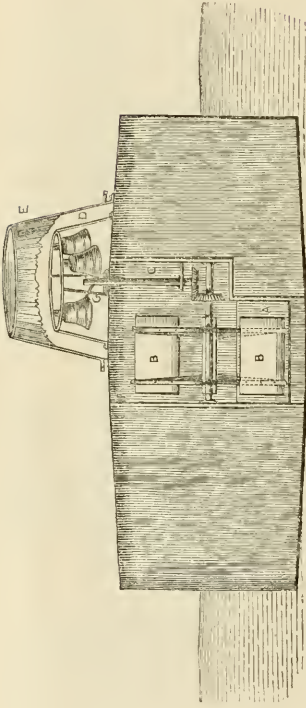
31.

I. The EARL of ROSSE:—I have not had sufficient experience at sea to be enabled to speak with confidence upon any of the points raised in these questions, and although I venture to make a few suggestions, it is more perhaps with the view of showing an anxiety to co-operate in every way in my power with the Royal Commissioners, than in the expectation of being able at present to propose anything useful.

II. The electric, the oxyhydrogen, and the oxycalcium lights far surpass in brilliancy the best oil and gas lamps, and if not too expensive there seems to be little doubt they might be advantageously employed in lighthouses. The experiment at the South Foreland will, I presume, decide the question as to the electric light. The only inconvenience which I have experienced in some experiments with the lime light arose from the occasional splitting of the lime cylinders. They are usually turned out of solid lime with a central hole drilled out. We found that they might be quickly made with powdered lime driven over a piercer in a brass mould like a rocket. To prevent the lime from adhering to the brass, a thin card was interposed. In the limited experience we had these cylinders did not crack. As to expense, the principal item would be the light expended in producing the necessary amount of divergence, and that would depend upon circumstances.

(continued on page 613.)

No. 1.

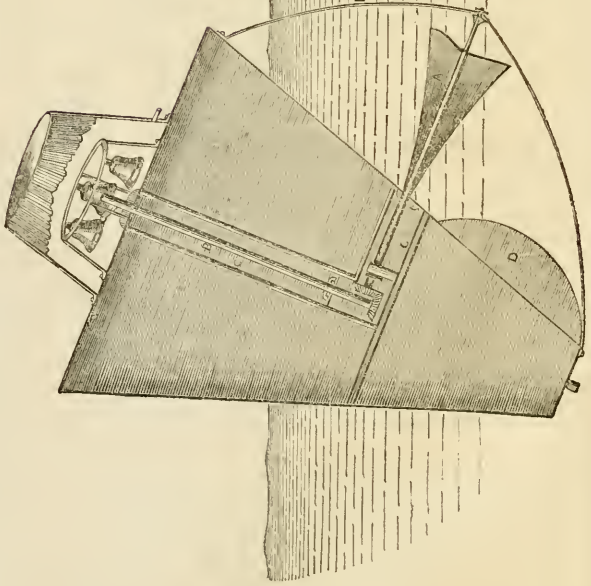


- REFERENCE TO No. 1 BUOY.
- A. Aperture for the passage of tide through the buoy.
 - B. Floats of paddle wheel inside of buoy.
 - C. Vertical shaft to which the hammer is attached for striking the bells.
 - D. Guard to suspend bells, if considered necessary.
 - E. Water-tight compartment.
 - F. Hammer for striking bells.

No. 2.

- A. Propeller attached to vertical shaft (B) for striking the bells.
- C. Water-tight compartments.
- D. Iron plate for keeping the buoy steady.
- E. Guard or stay for propeller, if considered necessary.
- F. Section of propeller.

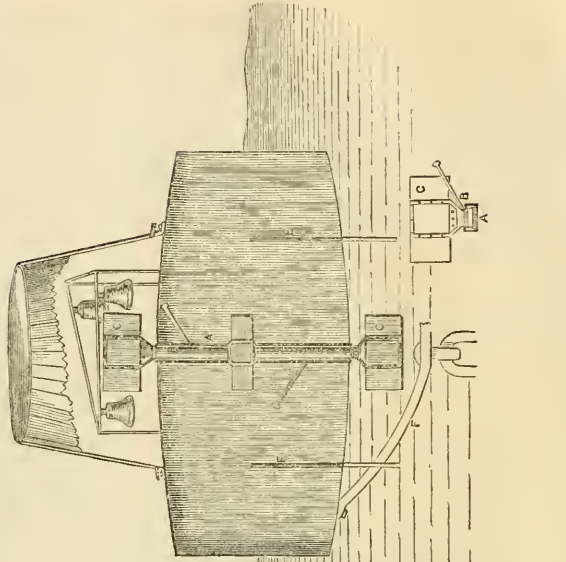
No. 2.



No. 3.

- A. Rim band round the buoy.
- B. Metal roller.
- C. Floats attached to band working over rollers (B), fixed in run band.
- D. Hammers for striking the bells attached to revolving band.
- E, E. Iron plates for keeping the buoy steady.
- F. Iron stay for securing moorings to buoy.

No. 3.



The EARL OF ROSSE.

III. I do not think there would be much difficulty in making one or indeed both gases in a lightship.

IV. I think a well made parabolic reflector. Almost all the light, indeed all the light where a lime cylinder is employed, is received by a parabolic reflector of sufficient size, and silver reflects about 92 rays in a hundred.

V. The dioptric apparatus.

VII. The present mode of figuring parabolic reflectors appears to me to be very defective. The paraboloid is a figure of revolution, and it can best be produced by turning. A cutting point guided by a parabolic templet would give, in my opinion, a paraboloid very superior in accuracy to one produced by any process of hammering, as at present. The templet might be made in different ways. For instance, a cone can be produced by the lathe with extreme accuracy, and therefore a section of a cone. The reflector must be cast of gun metal turned, electro-plated carefully, and finally finished in the lathe. The increased accuracy would only tell, however, in the case of a small source of light, or the central portion of a large one.

IX. Possibly in some cases it might be important to be enabled to identify a light with certainty, even at long intervals, say half an hour. A small cartridge of strontian fire would probably effect that object, and self-acting apparatus could obviously be contrived for producing the ignition at the required interval. Where there were several oil lights, to make one a lime or electric light would, I should think, completely identify it.

XI. In the first case, I know of no shorter or better method than that given in the Scientific Manual. In the second case, photometry appears to me to offer the only chance of even a rough solution of the question practically applicable. If the intensity of the light and transparency of the air were nearly constant, a scale of distance might be made connected with the thickness of tinted glass required for the extinction of the light. The practical arrangement would be a telescope furnished with a wedge of tinted glass giving motion to a scale. I have, however, had no opportunity of trying the experiment.

XIV. It appears to me that the form should in some degree vary with local circumstances. For instance, if with the aid of a suitable rudder the vessel can be made to ride head to wind, then it should be long, sharp, and of such lines as to roll least. On the contrary, if the strength of the tide is sometimes overwhelming, and means cannot be found by extra moorings or otherwise to keep the vessel head to wind, there seems to be no alternative but a very large beam. A circular vessel would obviously be in great danger if driven from her moorings. If the Commissioners have not yet examined Mr. Babbage's suggestions for improving lighthouses, I think it desirable that they should do so, as he is a man of great knowledge and great inventive powers. I am not, however, sufficiently acquainted with his views to be enabled to give a practical opinion on the subject.

32.

I. G. HOLLAND ACKERS.

II. My opinion respecting floating lights is, that floating lights, (whose bearings from each other shall be known,) placed (in line, if possible) some 10 or 15 miles from the headlands, and at some 30 miles apart, along the English and St. George's channels, being distinguished, say, the three westernmost being red, white, and green lights, the three next being red, white, and green revolving, the next three different again, and so on, would guide ships up channel, without seeking a light on shore whereby to ascertain their position, which causes many wrecks.

XVI. *a.* I believe the double cone or nun-shaped buoy the best.

XVII. Coasts, shoals, &c. should have buoys on each side respectively painted the same colour; say, on the north side red buoys, on the east white, on the south black, on the west checked; and the depth of water in feet at low springs should be painted in large figures on each buoy. This is applicable to the buoys now in use.

Mr. G. HOLLAND ACKERS.

If this arrangement was generally adopted and made known, no vessel would pass to the southward of a red buoy, to the westward of a white buoy, to the northward of a black buoy, or to the eastward of a checked buoy. On isolated rocks, or small patches, a buoy of some other colour and shape may be used where the buoy is by itself and unconnected with any other.

33.

I. GEORGE GLADSTONE, of St. Austin Friars, London.

II. I have never seen the South Foreland magneto-electric light, but I have heard it most highly spoken of by shipmasters and others.

X. *a.* Of coloured lights, red and green present the greatest contrast (to those, of course, who have a true perception of colour), and at the same time are the most readily distinguished from white light. I think, however, that the colours generally adopted are of too deep a shade. If the green contained less blue, and the red more nearly approached a scarlet than a crimson, the contrast would be more marked, and less light would be absorbed, so that they would be visible at a greater distance.

b. White light can be seen at a very much greater distance than the same light coloured by glasses, especially during a fog, coloured lights being visible only with great difficulty under such circumstances.

XIV. Not circular. This form will present the greatest possible resistance in proportion to its size, so that I doubt whether any ordinary moorings would hold a vessel of sufficient size of this form. The resistance of any vessel is dependent on the midship section, so that you can lengthen a vessel almost indefinitely without materially increasing the resistance (the increment in such case being principally due to mere friction), provided you do not alter her beam, and as the longer she is the sharper you can make her, I would suggest a long vessel with small beam, with a fine entrance, but full in the run, only just tapering sufficiently to avoid friction of the water against the ship's side. The fineness of the entrance would reduce the resistance as much as possible. The length of the vessel would tend to her steadiness and ease of motion, and the heaviness of the run in proportion to the entrance would keep her head well up to the sea.

XV. The hawse holes should be near the water line, and only a short distance in front of the centre of displacement, so as to avoid the strain caused by the pitching of the vessel, which would necessarily be increased the further they are carried forward.

XXI. Close to the surface of the water, as that will prevent the sound from spreading (as far as possible), and as all sounds have a constant tendency to rise, it would soon be lost to those on board a vessel if it originated from any elevation.

XXII. The light should in my opinion be placed as high as possible. There is frequently a dense fog near the surface of the water, while it is perfectly clear above, and I think a low light is more likely to be obscured in this way than one in a high situation is by the lowness of the clouds, and as a good white light can be seen from a ship's deck in ordinary weather as soon as it rises above the horizon, the higher it is placed the more useful it will be.

XXIII. Telegraphic communication may be extended to many of the lighthouses round the coast with most beneficial results. Many of the disasters which take place arise from the ships being overtaken by severe weather before the crews have had time to prepare themselves against it.

The keepers of the lighthouses which are in the most favourable situations for making meteorological observations might be instructed to watch the approach and course of storms, and to communicate at once by electric telegraph with the other lighthouses which are likely to come within the range of the storm, and by a code of signals th information could be communicated to all the vessels within sight. By these means it would be very easy to tell the shipping in the neighbourhood from what quarter and how soon a storm might be expected, as each lighthouse keeper could be informed of the state of the barometer, as well as the

Mr. G. GLADSTONE.

direction and rate of the wind at the other points of observation, and by comparing them with his own observations, will be able to calculate its approach with tolerable accuracy.

A military committee, which is now sitting at the War Office, Whitehall, of which Deputy Quarter-master-General Gordon is the secretary, has been considering the establishment of some military observatories (probably under the charge of the corps of engineers) at some salient points of the coast, to be connected with head-quarters by telegraph wires; and it has been suggested to this committee that it would be highly advantageous if such officers were at the same time to keep a regular daily meteorological register, and transmit their observations from time to time to Rear-Admiral Fitzroy for permanent record, while any important atmospheric disturbances should be immediately communicated by telegraph to the Downs, Lloyd's, Liverpool, and other places of importance to shipping. It seems probable that this suggestion will be carried out, and the scheme would be rendered much more complete were several of the most important lighthouses round the coast to be brought into *rappor*t with these military stations. As the lighthouse keepers have many other important duties to attend to, it would not be desirable to tax them with so many details as may reasonably be required of the military establishments.

The necessity in the case of lightvessels of swinging at their moorings, and of having at times a good length of cable out, seems to me to preclude the possibility of establishing telegraphic communication between them and the shore. In some cases, however, it might be arranged to convey the information to them by signals from a station on the mainland, to be repeated by the man in charge of the lightship for the benefit of others that may be at a greater distance.

34.

I. WM. BRAHAM ROBINSON, Esq., Senior Assistant Master Shipwright, Sheerness Dockyard.

IV. The dioptric system appears the best. The light should reach its brightest state once every minute.

VIII. No.

X. a. Green. This opinion is formed from having attended trials of bow-lights for ships.

b. White light.

XIV. A lightvessel, in an exposed position, is liable to break from her moorings, and therefore to be exposed to shipwreck, she should consequently be fitted for sailing or *steaming*. Length conduces to the reduction of the pitching and 'scending motions, and a moderately deep draught of water imparts lateral resistance, and consequently tends to lessen the rolling motion. As a ship always displaces a quantity of water the weight of which is equal to that of herself, it follows that after she is inclined from the upright position the water she displaces will be exactly equal to that displaced before the inclination, therefore the solid content of that part of the body immersed is equal to the solid content of that emerged by the inclination; but the forms of the solids immersed and emerged are not necessarily alike, and, if not similar, the axis of rotation, and therefore the centre of gravity of the ship, must rise or fall during the inclination and return to the upright position. From this it will be seen that the centre of gravity of the ship, in a vertical sense, and the axis of rotation should coincide with the water line to ensure an easy rolling motion. Also a lightvessel should have a sharp bow, as experience shows that sharp bowed ships require less heavy anchors to hold them than, *ceteris paribus*, full bowed ones do.

XV. b. Just above the water line.

XVII. The buoys now in use might, by colouring them, be made applicable for buoying coasts, harbours, rocks, shoals, and channels, a black buoy being kept to carry a vessel out of danger, bearing north, a white one south, a red one east, and a green one west, and a buoy to be kept bearing N.E. might be painted black and red, and one required to be kept bearing S.E. white and red, and so on with S.W. and N.W.

Mr. W. B. ROBINSON.

XXII. About a hundred feet, but the best position for a lighthouse is of paramount importance.

XXIII. All lighthouses and lightvessels should, if possible, be connected by electric telegraphs, so as to warn each other of approaching storms, and they should transmit barometrical and other intimations of approaching storms, &c. to passing ships by any code of signals in common use, or of easy application.

35.

Batignolles, Paris, le 16 Mars 1860.

Monsieur l'Amiral Hamilton, Président de la Commission Royale des Phares et Balises de la Grande Bretagne.

Monsieur l'Amiral, Permettez nous de porter à votre connaissance et à celle de la Commission Royale des Phares, que depuis plusieurs mois, nous avons joint à nos ateliers de construction de Paris, un atelier spécial pour la construction des appareils lentilleaires.

M. Degrand, Ingénieur au Corps Imperial des Ponts et Chaussées, attaché depuis 1848, jusqu'au 1 Janvier 1860 au service central des phares de France, a bien voulu, après y avoir été autorisé par décision de son Excellence Monsieur le Ministre des Travaux Publics, en date du 30 Décembre dernier, accepter la direction de cet atelier spécial, et c'est d'après ses conseils et sous sa surveillance immédiate, que seront exécutés tous les travaux concernant l'éclairage maritime et le balisage, qui viendraient à nous être commandés.

Les phares que nous nous proposons de construire, sont principalement ceux du nouveau système, imaginé par M. Degrand, dans lequel le moulage est en parti substitué à la taille pour la confection des lentilles, de manière à obtenir une réduction considérable dans le prix des appareils.

Les améliorations que nous avons déjà apportées dans la fabrication de ces nouvelles lentilles, en polissant avec soin les surfaces de moulage, de manière à leur donner un éclat comparable à celui des lentilles taillées, nous permettent de garantir pour les nouveaux appareils, un effet lumineux au moins égal à celui des anciens.

En adoptant en outre, dans certaines circonstances les nouvelles combinaisons de lentilles proposées par M. Degrand, il arrivera souvent que cet effet sera notablement augmenté.

L'avantage résultant d'une réduction considérable dans le prix subsiste donc tout entier en faveur des phares du nouveau système.

Dans un pays comme la Grande Bretagne, où un très grand nombre de phares sont munis de réflecteurs, cet avantage paraît avoir une importance toute particulière.

Les tours et les lanternes des phares actuels, sont dans un état parfait d'entretien, et peuvent être conservées telles qu'elles sont; il n'y aurait donc qu'à remplacer les appareils à réflecteurs par des appareils lentilleaires, et si au lieu des appareils anciens, de ce genre, dont le prix est excessivement élevé, on propose d'employer des appareils produisant les mêmes effets lumineux, mais coustant moitout cher, les économies qu'on sera à même de réaliser pourront atteindre un chiffre très élevé.

Ainsi, par exemple, pour un phare de 1 ^{er} ordre à feu fixe, la partie optique qui est payée dans l'état actuel, tant aux constructeurs Français, qu'aux constructeurs Anglais	£
Sera livrée par nous, au prix de	1,288
	644
Economie	644
ou 50 pour cent.	

Nous ferons en outre des réductions de 10 pour cent sur le prix de l'armature et de 15 pour cent sur le prix des lampes, ce qui portera l'économie totale à environ 670 livres par phare. De même pour un phare tournant, la partie optique complète payée maintenant	1,472
Sera livrée par nous, aux prix de	800

Economie	672
ou bien 45½ pour cent.	

Des réductions de prix comme ci-dessus sur l'armature et les lampes porteront l'économie totale à plus de 700 livres sterling.

Pour les phares des autres ordres, les économies sont dans les mêmes proportions et on peut les évaluer d'une

M. A. LAVALLEY.

manière assez exacte, en ce qui concerne les pièces optiques, en comptant sur une réduction de 40 à 50 pour cent. par rapport aux prix qui figurent sur les tarifs publiés tant en France qu'en Angleterre pour ces sortes d'ouvrages.

Indépendamment des phares lenticulaires du système de M. Degrand, nous exécuterons également, lorsqu'ils nous seront spécialement commandés, les appareils en verre taillé aux mêmes conditions que les anciens constructeur et en faisant toujours de notables réductions de prix sur la plupart des pièces mécaniques.

Nous sommes en mesure, en outre, d'exécuter aux meilleures conditions possibles de bonne confection et de bon marché, non seulement les lanternes en fer et en bronze et leurs vitrages, mais encore les tours en fonte ou en tôle sur lesquelles on les installe assez fréquemment maintenant; les tourelles et échafaudages pour la même destination, les phares sur pieux-à-vis, les phares flottants, les bouées et bouées-balises, et en un mot tous les ouvrages concernant à quelque titre que ce soit, l'éclairage maritime et le basilage.

L'ancienneté de nos ateliers de Paris et de nos chantiers de Nantes, ainsi que l'importance exceptionnelle des travaux que nous exécutons, tant pour la Marine Impériale de France que pour divers pays étrangers, paraissent sans doute des garanties suffisantes pour qu'on puisse compter sur la bonne exécution des ouvrages qui viendraient à nous être confiés.

Nous n'avons pas besoin d'ajouter qu'aidés du concours de M. Degrand, nous nous efforcerons constamment d'introduire dans nos appareils tous les perfectionnements qui pourraient être proposés tant en France qu'à l'étranger.

Plusieurs ouvrages et entre autres un phare de 5^e ordre, nous ont déjà été commandés par l'Administration des Phares de France, et sont en cours d'exécution dans ce moment-ci dans nos ateliers.

Permettez nous d'espérer, Monsieur l'Amiral, que la Commission Royale, prenant en considération les faits que nous venons d'exposer, voudra bien donner son approbation aux phares du nouveau système et recommander à l'attention soit du Board of Trade, soit des diverses Corporations des Phares de la Grande Bretagne, les propositions que nous avons l'honneur de lui soumettre en ce qui concerne les appareils et autres ouvrages que nous sommes à même d'exécuter.

Nous sommes avec les sentiments les plus respectueux,

Monsieur l'Amiral,

Vos très dévoués serviteurs,

Pr. Pon. Ernest Gouin & Cie.

A. LAVALLEY.

Batignolles, Paris, le 29 Mars 1860.

Monsieur l'Amiral Hamilton, Président de la Commission Royale des Phares d'Angleterre.

Monsieur l'Amiral,

Nous nous comprenons de répondre à la question, contenue dans la lettre que vous nous faites l'honneur de nous adresser, en date du 28 courant, au sujet du phare de 3^{me} ordre que nous exécutons dans ce moment-ci pour le compte de l'Administration des Phares de France.

L'appareil est composé de lentilles moulées et taillées, d'après le nouveau système imaginé par M. Degrand, et son prix sera inférieur de près de moitié, à celui d'un appareil semblable qui aurait été exécuté en verre taillé, d'après l'ancien système, suivi jusqu'à présent par les anciens constructeurs de phares.

Cet appareil sera prochainement terminé et doit faire l'objet d'expériences spéciales de la part de M. l'Inspecteur-Général Reynaud, Directeur des Phares de France.

Il sera dressé par M. Reynaud, un procès-verbal de ces expériences et si vous voulez bien nous le permettre, nous aurons l'honneur de vous en adresser ultérieurement, une copie.

Cette même commande comprend la lanterne du phare, les lampes et autres accessoires, tels que escaliers en fonte, &c.; tous ces ouvrages seront livrés à l'atelier central des phares à Paris, en même temps que l'appareil avant la fin du prochain mois d'Avril.

Nous avons l'honneur d'être,

Monsieur l'Amiral,

Vos très humbles et obéissants serviteurs,

Pr. Pon. Ernest Gouin & Cie.

A. LAVALLEY.

M. F. C. VANNET.

I communicated my scheme for navigating safely with buoys to l'Abbé Moigno, when he published the short translation of the inquiries of the Royal Commission in his "Cosmos."

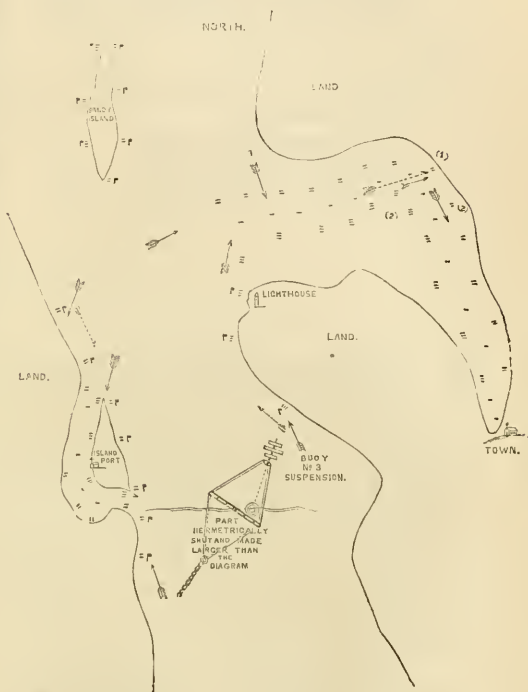
I beg your permission to explain my idea in French, making me better understood.

Hoping that the plan will benefit mankind.

I am, &c.

F. C. VANNET.

10, Rue de la Fidélité.



flag.
One.
Two.
Three.

direction of a sail.

- (1) on the axle of the 2 number 1 in a limited curve.
(2) according to N. B. exception.

several positions in which a sailor finds himself in foggy weather, and how easy he can get out from danger by a little care given to my scheme of buoys.

vessel engaged in a pass, she crosses two buoys No. 2, meets with No. 1, finds herself in the pass. New directions taken after reckoning.

The Commission Royale des Phares d'Angleterre ayant demandé s'il y avait quelques perfectionnements à apporter dans les bouées et dans leur mode d'amarrage, question que je laisse aux praticiens au sujet de l'équilibre et de l'amarrage; à côté de cela, je reconnais qu'il y a toujours eu un vide qui n'a pas été rempli; "le distinctif" pour naviguer sûrement, quand on se trouve dans une passe ou que l'on rencontre une bouée sans qu'on ait pu apercevoir la côte. Qu'arrive-t-il actuellement quand un bâtiment entre dans une passe, il tâtonne, marche à $\frac{1}{2}$ vapeur et cherche à s'orienter, tandis que le système que je propose, le met à même de connaître sa route soit par les bouées de droit ou de gauche ou celles du centre. Se trouve-t-il porté comme dans la Manche ou Canal St. Georges, par des courants, sur un bas fond ou roche non aperçue par les brouillards, la bouée qu'il rencontre lui indiquera où est le danger et la route pour aller au large.

On a revêtu le sommet de ces flotteurs d'appendices suivant les ports, ou de signaux conventionnels, c'est là le grand tort, il ne devrait y avoir qu'un système, unique et facile; mettant à même le premier matelot de connaître un passage pour la 1^{re} fois comme le pilote.

36.

Sir, Paris, April 20, 1860.
In answer to the questions of the Royal Commission on the buoyage system, which I read to-day in the Monthly Mechanics' Magazine, I beg to let you know, Sir, that

M. F. C. VANNET.

Système.—Je me sers de 5 bouées, 3 suffiraient au besoin pour le système, les 2 autres seraient comme accessoires. Chaque bouée serait munie d'une tige maintenue perpendiculaire par un contrepoids balancier et à son extrémité il y serait fixé à angle droit un cercle ou anneau de 8 pouces de large environ et de 2 à 3 pieds de diamètre, de manière à représenter de tous côtés une transversale.

1. J'appellerai cette bouée avec une transversale No. 1.
2. Je ferai la bouée No. 2 en y ajoutant à la partie supérieure un cercle plus petit en diamètre.



3. Quant à celle No. 3, j'y mets encore un cercle mais dans la partie inférieure.

4. Pour les bouées accessoires, l'une restera sans appendice, telle qu'elle est aujourd'hui, servant à marquer un bas fond sans danger, une chaîne ou un ancre.



5. L'autre portera un pavillon en fer carré, qui tournera au gré du vent et s'amarrera de 20 à 40 mètres d'une à numero, dans la direction où il n'y a pas de danger.

Théorie.—Pour tout navire allant au nord, est, ou ouest, à l'entrée d'un chenal ou port, il aura à sa gauche la bouée No. 2; au milieu du passage il rencontrera la bouée No. 1; et à sa droite le numero 3. Le voila donc sûr de sa route, il ne doit pas sortir du 2 et du 3, tandis qu'auparavant, indécis, il se guidait sans le vouloir sur des bouées en dehors comme les numeros 2 ou 3.

Dans un passage à courbe trop courte soit à droite, soit à gauche, il est urgent d'établir une bouée à la courbe extérieure No. 2 ou 3 dans l'axe des deux numeros 1 les plus proches, pour que le navigateur puisse, dans le cas ou les bouées No. 2 et 3 laterales et le No. 1 suivantes, invisibles momentanément, continuer sa route en ligne droite et rencontrer alors la bouée 2 ou 3, ce qui le remettrait dans sa route. Voir flèche pointée (1).

Côtes.—Toutes les côtes à droite seraient munies simplement de bouées No. 3, avec celles à pavillon à une distance voulue dans la direction de la pleine mer ou espace le plus large à naviguer.

Les bouées No. 2 seraient fixées aux côtes à gauche et pavillon.

Les numeros 1, 2, ou 3 indiqueraient (sans drapeau ou pavillon fixé à côté) de porter toute attention, qu'on se trouverait au milieu d'une passe ou sur les bords.

On éviterait ainsi bien des malheurs, que de capitaines après plusieurs jours de brouillard se trouvent sans le soupçonner près des côtes, rencontrent une bouée sans signe fixe, étonnés et peu sûrs d'eux mêmes font souvent fausse route, comme aussi se trouvant près de terre ils ne peuvent avancer sans pilote.

Objection.—On me dira que ceci est connu, que l'on va très bien avec la routine, il en était de même des signaux anciens avec le télégraphe de Chappe, et la télégraphie actuelle; des signaux des flottes d'Alexandre aux signaux de Nelson, et de l'Amirauté actuelle.

N.B.—Dans la situation d'un port qui se trouve au sud et qu'il faille passer par quelques bouées à l'est ou à l'ouest, ou conservera, par exception les bouées No. 3 à droite, mais pour y arriver, le capitaine a déjà reconnu son entrée.

Par l'esquisse vous verrez les différentes positions des navires.

Dans l'espoir qu'un système si simple sera bientôt adopté universellement, quand la Grande Bretagne aura commencé à le mettre à exécution, je ne demanderai qu'à conserver mon nom, et encore devant l'humanité l'homme doit s'effacer.

J'ai l'honneur d'être, Messieurs,

Votre humble serviteur,

F. C. VANNET.

10, Rue de la Fidélité, Paris.

Mes voyages fréquents m'ont fait reconnaître la nécessité d'autres perfectionnements à faire dans la marine.

M. F. C. VANNET.

Sir,

Paris, April 23, 1860.

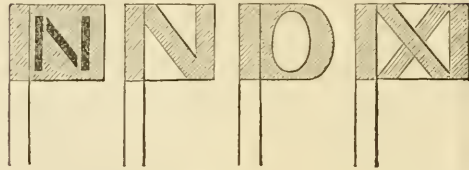
In my letter, April 20th, on the buoyage system, I wrote that I use circles instead of balls, the former being better visible in a fog than three balls, which appear like a column when we are not close to them. As the Royal Commission desires any improvement to be applicable to the actual buoy, my system may be applied without using the double movement, but in few cases by the wind and sea the circles would look like balloons. There would not be any danger of approximating to distinguish. To improve the system, instead of using the square flags, broad sheet-iron letters might be employed to designate a coast or harbour, and Roman numbers for lighthouses, so that at one or two degrees distant the same letters should not be employed.

The letters D, F, G, I, J, P, Q, R, X, excepted, for their similitude with the others and with the Roman numbers.

I am, &c.

F. C. VANNET.

10, Rue de la Fidélité.



Or, letters cut off.

37.



SCALE OF FEET.

0 1 2 3 4 5 6 7 8 9 10 FEET

Dear Sir, Marine Surveyor's and Water Bailiff's Office, Liverpool, May 5, 1860.

The following is a copy of so much of the monthly report for April as refers to the Queen's Channel Bell Beacon.

Mr. M. T. PARKS.

"The mirrors fitted to the New Bell Beacon upon the recommendation of Mr. Graves, consequent upon his observation of the utility of such a contrivance, seen by him in course of his duties connected with the Royal Commission of Lights, Buoys, and Beacons, is nearly ready, and will be in its place in a few days. The new beacon, built in Liverpool, and sent to its station on the 1st of March, continues to promise favourably, making itself audible, even with unfavourable circumstances of smooth water, at a distance of a mile."

I enclose a sketch showing the proposed mirrors as designed to be fitted. As comparisons between the new and the original Queen's Channel Bell Beacon lead to conclusions doing an injustice to the principle of the buoy, it should be known that the original beacon was not designed for a bell beacon, but simply for a Herbert's patent pillar buoy, which having been adopted as a Queen's Channel fairway beacon, while the old beacon rode in the fairway of the Victoria Channel, on the closing of the Victoria Channel was converted to a bell beacon. Its stability prevented the bell sounding effectually, and, as a consequence, it became subject to collision, and was thereby three times disabled.

Yours truly,

MURRAY T. PARKS.

S. R. Graves, Esq.

38.

- I. WILLIAM DARLEY, Superintending Measurer, Acting Foreman of H.M. Dockyard, Sheerness.
- II. Lighthouses may be so constructed as to admit of a gasometer producing a sufficient quantity of gas, whilst a limited supply of oil with lamps could be kept in the event of accident.

The electric light, if it can be maintained, is the most desirable.

- III. For floating lights exposed it is most practicable to use oil.
- X. *a.* White particularly; red; yellow; green; blue. White or yellow fringed with red would be well identified.

b. White.

- XII. I would suggest for such positions as the Goodwin Sands that a building of great utility may be raised of any magnitude, and forming a foundation for a much desired lighthouse. A vessel may be built of iron, floated to the desired spot, and there sunk, the interior being arranged into watertight compartments may be filled with masonry.

This I suggested to Captain Bullock some seven years since, who fully fell in with my views, and expressed a disposition to introduce the subject to the Trinity Board.

- XIII. I would recommend that lights be arranged and reflectors to show the mariner the letters N. E. S. W. at the cardinal points on lighthouses at sea, the reflectors and gas arranged thus:—*a.* light; *b.* reflector facing the cardinal points.

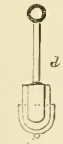


- XIV. As near as possible in shape as the paddle-box boats of our men-of-war steamers.

I believe it is advisable to moor below the centre of gravity, especially where exposed to strong winds and tides.

- XV. *b.* Just above the water's edge and of a good stove; particular care should be taken to secure them well to meet the sudden strains.

- XVI. *a.* Buoys of a cylindrical form of about two feet six inches in diameter, ballasted at the lower end, may be made to project some distance above the water as *d*, and be rendered conspicuous; they may be moored a short distance below the centre of displacement.



For exposed situations, I would recommend them to be built of iron, and one encased within the other, thus:—so that in the event of an accident happening to the outer one, the buoyage is not destroyed.



- b.* Circular of this section:—
(*a.*) Signal ball.
(*b.*) Guard Iron.



Mr. WM. DARLEY.

- c. Polished balls to ship on a staff, or glass balls silvered on the inside, would have a tendency to reflect light enough to render them visible by star or moonlight.
- XIX. The steam whistle on board vessels steaming. Bells at headlands and along shore.
- XX. A funnel pointed in any direction would have a tendency to guide the sound, fitted with apparatus so as to be easily turned on a pivot.
- XXIV. Illuminated figures moved by the tide I believe of most service.
- XXV. *a.* By different arrangements of flags, both in number and colour, this may be effected.
b. That to which I referred in article 13, by using coloured lights, by which any lighthouse may be known, having reference to notices that should be given to mariners.

39.

- I. ROBERT AYTOUN, W.S., Assoc. Inst. C.E., Patentee of a Safety Cage for Miners, Edinburgh, 3, Fettes Row.

See also my letter of date 5th June, 1860, to the Secretary

- XV. *a.* Yes.

b. I propose attaching the cable to the middle of a chain which proceeds from either side of the vessel amidships, thus:—



The straining of a vessel against its anchor is mainly caused by pitching. The whole tonnage of the vessel is set into violent oscillatory motion by the upheaving of a wave, and is brought to a standstill by the cable as it is ordinarily placed, but is allowed to expend itself in the plan I have drawn without straining the cable or anchor.

40.

CIRCULAR II.

Paris, le 29 Juillet, 1860.

DEGRAND, Ingénieur des Ponts et Chaussées, 11, Rue Louis le Grand.

- I. *a.* Il n'y a utilité à indiquer au constructeur la hauteur du phare que lorsque cette hauteur doit être considérable et d'épaisseur, par exemple, 150 or 200 pieds. Au-dessous de cette limite les dispositions de l'appareil restent exactement les mêmes quelle que soit la hauteur de la tour, et le constructeur n'a pas intérêt à la connaître; au contraire, lorsque la hauteur est plus grande et surtout lorsque le phare doit être situé, par exemple, sur des falaises élevées, une côte montagneuse, &c. il devient nécessaire d'incliner légèrement les lentilles et de relever la lampe placée au foyer, et dans l'intérêt de la bonne construction de l'appareil, il convient que le constructeur soit prévenu d'avance. Il va sans dire que la hauteur du phare doit toujours être comptée à partir du niveau de la mer.

b. Il est toujours nécessaire d'indiquer d'avance au constructeur l'angle exact de l'horizon à éclairer.

- II. Lorsque les appareils lentillaires doivent présenter les dispositions adoptées en France il n'y a nul intérêt pour le constructeur à connaître la hauteur du phare et l'angle à éclairer avant de tailler les prismes entrant dans la composition des lentilles.

Le travail de ces pièces est dans tous les cas le même.

Mais si l'on adoptait des combinaisons nouvelles de lentilles, comme par exemple dans le but de concentrer toute la lumière d'un phare sur un point déterminé, de la diviser en deux ou plusieurs faisceaux suivant des directions spéciales, &c., il serait nécessaire pour le constructeur, avant de commencer le travail, de connaître exactement toutes les données du problème, parceque le profil même des lentilles devrait dans quelques circonstances être calculé d'après ces données.

Quant aux armatures en bronze dans lesquelles les lentilles sont montées il est toujours utile de prévenir d'avance le constructeur lorsque le phare

M. DEGRAND.

doit avoir une grande hauteur parceque dans ce cas les formes de ces armatures doivent recevoir certaines modifications toujours difficiles et dispendieuses à exécuter après coup.

- III. Il est extrêmement aisé de dresser d'avance des tables indiquant au constructeur l'inclinaison à assigner aux lentilles suivant la hauteur du phare au-dessus du niveau de la mer. Des tables de ce genre existent déjà en France, et il suffit de donner au constructeur la hauteur du phare pour qu'il sache immédiatement s'il y a lieu ou non d'incliner les lentilles et de combien il faut les incliner.

Quant à l'angle de l'horizon à éclairer il suffit d'indiquer cet angle en degrés au constructeur pour qu'il sache immédiatement le nombre de lentilles à employer et l'amplitude à donner aux faisceaux lumineux.

Enfin pour les problèmes spéciaux d'éclairage qui pourraient se présenter et exigeraient le calcul de nouveaux profils pour les lentilles, il doit suffire de quelques jours au constructeur pour faire ces calculs et il existe pour cela des formules d'un usage aussi aisé que celui des tables.

- IV. Je n'ai pas eu connaissance qu'on ait eu occasion en France d'assigner aux constructeurs des délais quelconques pour des calculs de ce genre.

En France les ingénieurs des phares, faisant des commandes, préparent d'habitude tous les calculs et arrêtent eux-mêmes les dispositions des appareils, le constructeur n'a à cet égard qu'à se conformer strictement à l'ordre qu'il reçoit et aux instructions qui lui sont données pour l'inventeur.

41.

Paris, le 20 Juillet, 1860.

Au Secrétaire de la Commission Royale des Phares, &c.
7, Millbank-street, London.

MONSIEUR,

NOUS avons l'honneur de vous accuser réception des listes de demandes touchant les phares que vous nous avez envoyées il y a quelque temps. Nous regrettons qu'une longue absence de M. L. Sautter nous ait empêchés d'y répondre plus tôt.

Sur plusieurs de ces questions, tout ce que nous pourrions dire à la commission est déjà parfaitement connu d'elle, soit pour avoir été imprimé dans des ouvrages spéciaux tels que ceux publiés par MM. Thomas et Allan Stevenson, par le Gouvernement Espagnol, &c., &c., soit pour être de plus longtemps pratiqué en Angleterre ou dans d'autres pays. Nous pensons toutefois que la commission trouvera quelques renseignements nouveaux sur ce sujet dans la " Notice sur les Phares lentillaires," que nous avons fait imprimer l'année dernière, et dont nous vous prions d'accepter un exemplaire.

Nous nous bornerons à inscrire en face de chaque question, la page de la notice qui renferme la réponse, ajoutant, pour quelques unes d'entre elles les observations que nous ont suggérées notre expérience personnelle.

Agrééz, P.

L. SAUTTER & C^{ie}.

I. L. SAUTTER & C^{ie}, 37, Avenue Montaigne, Paris.

- IV. Voir Notice sur les Phares, pages 13, 14, 15, et les planches à la suite.

Dans notre opinion l'apparence de phare dite à feu fixe varié par des éclats peut donner lieu à des méprises, et il vaut mieux autant que possible s'en dispenser. Nous pensons toutefois que dans les phares à éclats une petite portion de la lumière doit être conservée sans forme de feu fixe, de manière que les éclipses ne soient jamais totales.

- V. Voir Notice sur les Phares, pages 13, 14, 15, et les planches à la suite.

VI. Le système lentillaire est sans aucun doute applicable aux feux flottants (voir planche 42 de notre ouvrage). Nous construisons en ce moment trois appareils de ce genre pour un gouvernement étranger.

- VII. b. Quant à la qualité du verre, il faut se préoccuper de sa blancheur et de sa pureté, mais plus encore de son inaltérabilité. Le plus souvent les verres très blancs ne le sont qu'à la condition d'être très tendres, c'est à dire, de perdre promptement leur poli et leur transparence à l'air de mer. Plus le verre contient de silice, meilleur il est.

d. Voir notre Notice, pages 22 et 23.

VIII. Non.

- IX. A nos yeux la coloration rouge doit être la seule employée. Le verre rouge qui doit être préféré est

MM. L. SAUTTER & C^{ie}.

celui connu en cristallerie sous le nom de *doublé à l'or*, parceque c'est le seul qui colore la lumière sans en absorber une grande portion, comme tous les autres. Ce verre étant fort cher, et ne pouvant être obtenu en grandes feuilles, la meilleure manière de l'employer est d'entourer la cheminée de cristal blanc, d'un manchon en verre coloré comme il a été dit plus haut. Ce moyen est préférable à l'emploi d'une cheminée en verre de couleur, parceque si celle-ci se brise, le phare devient blanc, ce qui est un grave inconvénient.

X. a. Le rouge.

- XIII. Voir pages 15, 16, et 17, de la Notice à les planches à la suite.

Nous recommandons particulièrement pour les appareils de quatrième ordre le système de rotation sur pivot (planches 31, 32, &c.) qui a donné d'excellents résultats.

Pour les lampes nous recommandons beaucoup l'emploi des lampes à réservoir supérieur placé tout en haut de l'appareil, avec écoulement d'huile réglé par une soupape conique. Le maniement de ces lampes est rendu très commode par l'addition d'une pompe servant à remonter l'huile dans le réservoir supérieur. Nous en avons construit de cette espèce qui fonctionnaient parfaitement.

CIRCULAR II.

- I. a. Ce renseignement est indispensable dans le cas où la hauteur du phare est telle qu'il faille donner aux rayons une direction plongeante, parcequ'il entraîne des modifications dans la construction de l'appareil.
- b. Ce renseignement est nécessaire également parceque dans l'arc qui ne doit pas être éclairé, l'optique est remplacé par des réflecteurs.
- II. Autant possible ces renseignements doivent être donnés au fabricant en même temps que la commande. Cependant pour le premier ce n'est pas indispensable, il suffit qu'il l'ait au moment où il fait le montage dans l'atelier.
- III. Ces données existent, il est en tout cas facile au constructeur de les calculer, et c'est généralement lui que ce soin regarde.

42.

- I. AMB. H. RENTON, C.E., 12, Buckingham Street, Adelphi.
- XIII. In an arrangement for showing two or more revolving lights simultaneously to an observer may be rendered complete and certain by regulating the periods of successive flashes by means of a pendulum, governed by an electric current by which the two movements may be rendered isochronous at whatever distance apart.
- XIV. XV. a. b. A vessel of a circular form, moored from the centre of gravity, as proposed by Mr. G. Herbert. The attention of the Commissioners is respectfully requested to paper marked " Paper referred to in Mr. Renton's Evidence," sent herewith.
- XVI. a. b. Mr. G. Herbert's method of mooring from the centre of gravity in all situations.
- XXI. The prevailing winds may determine this. If they be off shore, the signal may be placed low, if on shore the signal should be placed high; for as the advancing wave presents a steeper front than the receding, the small angle at which the sound, if placed low, would strike against the advancing wave would dissipate it very speedily to an ear placed so close to the water as on the deck of a ship, while if the wave be receding from the signal, the sound will travel with but little interruption along the wave surface.
- XXII. The adoption of floating lighthouses would in most instances render a very extended range of light unnecessary.
- XXIII. The establishment of a floating sub-marine telegraph station, placed at the entrance of the English Channel would prove the most serviceable arrangement to commerce and shipping. (See accompanying paper, page 21, and model herewith.)
- XXV. a. By placing conspicuous numbers on towers of floating lighthouses.
- b. By causing the character of a light to indicate the nature of the position in which it is placed. (See paper to accompany Mr. Renton's Evidence, pages 44 and 20.)

43.

I Lieut. M. CURLING FRIEND, R.N., 44, Ashburham Grove, Greenwich.

A general system of buoys and beacons to be used throughout Great Britain and its colonies can, in my opinion, be easily devised; and I beg to propose one which is so simple that the mariner may without chart or pilot bring his ship into port. It was carried out by me in the river Tamar, in Tasmania, and with perfect success.

Advantages.—The system is as economical as possible. The beacons can be erected anywhere where a few masts and spars are to be obtained; and any man with a saw, a hammer, and a mortice chisel can put them up. Moreover, the memory of the mariner is assisted artificially by an association of ideas, which renders it impossible for him to forget the interpretation of any mark.

Principles.—The principles of the system are the following:—

1. In the open sea the direction of the obstacle from the buoy or beacon is shown by its compass bearing.
2. In a river, harbour, or port, properly so called, the compass is not used, but the direction of the danger is simply indicated, as being up or down the stream, or to the starboard or port hand on sailing up it.
3. To enable us to use the same marks in rivers and ports as in the open sea, the supposition is always made that the river or port *trends to the north*, whatever its true direction may be; hence a danger upwards in entering a river has the same marks as a danger northwards in the open sea, a danger to the port hand of a buoy on sailing up a river will be indicated by the same painting of the buoy, as a danger to the westward of it on the open sea; and so of the other marks.
4. Other colours than black and white are not depended upon, although they are very useful in denoting contingent circumstances; *form* is therefore the distinguishing feature of the system. The nun buoy is recommended in running streams, the can buoy in still water.

Artificial Memory.—The association of ideas necessary for interpreting the buoys and beacons is thus arrived at.

A white buoy in the open sea is interpreted "Danger West," associating the W. in White with that in West. On entering a river it is read "Danger Port," as before remarked. A mast in the open sea transversed by two spars, which form a V, thus is:—is also read "Danger West," as the V is part of a W; in a river it is "Danger Port."

A black buoy in the open sea is held to mean "Danger East," as black is the contrary colour to white, which has been used for "Danger West." In a river it is "Danger Starboard." A mast in the open sea with a horizontal bar forming a cross with it thus:—must be considered to mean "Danger East," from the slight connection a horizontal line bears to a capital E. In a river it is "Danger Starboard."

The marks for indicating danger to the north and danger to the south can easily be had by combining those which we have already laid down. The buoys must be chequered, and the beacons formed of equilateral triangles attached to masts.

A triangle with its apex upwards met with in sailing up a river will obviously require the interpretation "Danger up the River," or "Danger up," and would of course be placed on the lower spit of a reef, but as up the river is always considered by a fiction to mean northwards, the triangle with its point upwards must also be read "Danger North," which is therefore its reading in the open sea. In like manner the chequered buoy which has to be read "Danger North," must be striped lengthways, with black, or the stripes must point upwards. Such a buoy met with in sailing up a river would signify "Danger upwards," and would be placed on the lower point of a reef.

A beacon, of which the triangle points downwards, found in a river would signify "Danger down the river," and would be placed on the upper spit of a reef; but as down the river is by our

fiction considered southwards, it follows that a triangle with its apex downwards found in the open sea must be interpreted "Danger South." The chequered buoy, signifying "Danger South," in the open sea, must have red rings painted round it, which will make it look as different as possible from the "Danger North," buoy. The same buoy found in a river would signify "Danger downwards," and would be placed on the upper spit of a reef.

A buoy placed over an isolated obstacle having a passage all round it must be painted "in *chequers*," red, white, and black. A beacon intended to have the same signification must be composed of a lozenge crossed by a bar and fixed to a mast, thus:—

This form of beacon may be supposed to combine all the others, and the buoy resembles it in pattern.



This is the essential part of the sea and river marks proposed, however many additions may be made to it, which are highly advantageous. The rings of the buoy signifying "Danger South," or "Danger down," ought to be red and white for greater distinction, and in general the colour red may be substituted for black when any particular locality has to be denoted, or the attention called to any particular circumstance. Also the V's and crosses on the west and east beacons may be doubled for the same purpose, or vanes may be added to them, making the vane above a V, of the swallow-tail shape, and giving that above a cross parallel sides. A green buoy would indicate a temporary danger, as a wreck. The following is a table of signals, with their interpretation:—

Buoy.	Beacon.	Vane.	In the open Sea.	In sailing up a River.
			"Danger West."	"Danger Port."
			"Danger East."	"Danger Starboard."
			"Danger North."	"Danger up."
			"Danger South."	"Danger down."
			Passage all round.	

Note.—As to colour. The buoy denoting "Danger South" should have red stripes or rings, and that denoting "Passage all round" should be chequered red, white, and black. The yellow buoy may be substituted for white, as the red for black.

Lieut. M. C. FRIEND.

- XI. *a.* To ascertain the distance from a lighthouse when running towards it, the height of the lighthouse being known.

Divide the constant 3438 by the angle subtended by the lighthouse, measured in minutes by a sextant or quadrant, the quotient multiplied by the height of the lighthouse in feet will give the distance in feet.

If the angle is measured in seconds the constant must be multiplied by 60.

MATT. CURLING FRIEND.

44.

- I. JAMES MACKINTOSH, 5, Cook Street, Liverpool.
 II. Yes, from cannel coal gas combined, when necessary, with oxygen, the process of manufacture being alike. The gas to be naphthalized, and when used with oxygen to be burned as a Bude light.
 III. As above; the gases to be condensed into holders; purification by the dry process.
 V. The dioptric apparatus as in use at Corduan and Sherryvore.
 The light to be given by a platinum Bude burner, fed with compressed gases (to 2 atmospheres.) This would give a small intense light, and corresponding diminution of lenticular apparatus. The occultations to be given by the gas itself, shutting, reducing, and opening valves in a meter, or by pendulum and wheel work applied to suppress, at regular intervals, the supply of oxygen, and reduce that of hydrogen.

V. As No. 4.

VI. Yes, paying particular attention to good stowage.

VII., *a.* Manufacture reflectors by the electro process, both body and silvering. The mould could be made nearly mathematically correct.

b, c. Might not glass plate be cast in plain ridge and furrow, then polished, the ridges at such an angle as would assist the light passing through them by inducing total reflection.

VIII. I have a belief that colours might be given with more effect and less loss of light, by the introduction, in suitable situations, of hollow glass lenses or prisms of white cut flint glass, filled with a highly refractive coloured fluid not liable to freeze. Alcohol, turpentine, bisulphuret of carbon, naphtha, Striae would be avoided, and cheapness of manufacture attained.

X., *a, b.* Call white a colour, then in *all weathers* in my opinion red is most serviceable, as penetrating farther through a fog than white. In clear or medium weather, white has decidedly the advantage; green ranks after red, but at a considerable distance; no other colours effective.

XII., *a, b.* Take one of the submarine cables presently in use between England and the Continent, strong enough to resist anchors, say there are two wires, one copper, one steel, through the core, both insulated from external influences, and from each other; the steel wire runs up into a spiral, forming a hollow tube; the cable runs across, say the Goodwin, and at a point fixed seaward, it is brought to the surface and cut. The end terminates in a magazine, supported on a stem, which is floated and kept upright by hollow submarine buoys properly anchored. The shore end of the tube cable terminates in a gas holder of condensed oil gas (made from fish and fish refuse), and in connection with the wire is a pendulum, wheel work, and galvanic battery, the former oscillating 70 times to the minute.

On the apparatus being set in action, the gas (decolorized?) rushes through the tube, and as it rises into the magazine, a series of induction pipes enable the atmospheric air to mix with it to a degree which will give the strongest explosive mixture.

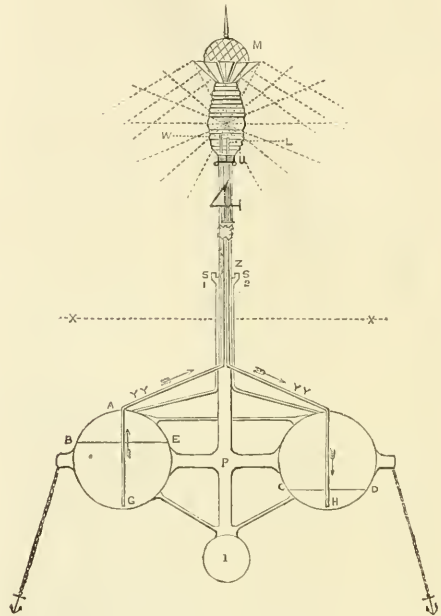
The look-out man on board ship, finger on pulse, counts so many, then a loud bright explosion rings out, brightening by reflection the clouds overhead. The magazine is surmounted by a series of prisms to assist the flash of the fire-damp. Occasional union joints to be inserted to give increased portability to the cable, and to aid a speedy repair in case of accident.

There might be major and minor flashes, the second occurring briefly after the first. This plan

Mr. J. MACINTOSH.

I believe would be useful in clear and hazy weather, rain, hail, or snow.

A reciprocating circulating Floating Light Beacon (see Diagram), proposed to burn paraffine



or belmontine oil. These materials have the great merit of being always fluid in any temperature of navigable seas.

I give a decided preference to the belmontine, on account of its giving greater intensity of light, and less or no char on wick when the oil is kept close to it. P, stem; I, solid iron ball; G and H two (2.4.6. or 8.) reservoirs (500 to 800 gallons capacity); B, G, E, and C, H, D, the oil; B, A, E, strongly condensed air by means of tube S; X, X, sea level; U, silver wire strainers; L, lamp cisterns; Y, Y, Y, Y, up and down oil pipes, the up one terminating with a needle eye hole at W, in an intercepted jet above the oil level; the wick glass to be suspended from the top of lantern by hinges or gimballs; Z to be open, while reservoir G is emptying. If the wick charred soon, then elongate it, and very slowly move a clean double edge by wheel work. A number of white and coloured lights might be grouped on the one stem, at the same or different elevations, and all thrown on one plano-convex lense. M, glass or mica-plated sun-reflecting and hollow ventilating ball. With highly rectified oil the wick might require trimming each 10 days.

XIII. Take a tube similar to a large steam ship funnel strengthened, and supported by four pillars, have air fans at the bottom; by these throw into the "air gun" a combined mixture of air, coal-gas, finely powdered rosin dust, gunpowder dust, mixed with strontia (red) and copper (green) powders for colouring. These to be discharged to the zenith at regular intervals, by pendulum and battery, or wheel and percussion caps.

XIV. Could not photography be so applied as to test the relative steadiness of light ships and buoys? Range those under review in a sea-way; give each a light tall mast and a "square" yard, the three ends tipped with hoop balls. The competitive papers produced by the aid of a camera would be a fair test of their relative steadiness.

XVI. Bore a certain number of one-inch deep treenail hole in a wooden buoy, insert therein cylinders of glass internally silvered. These spangles would reflect at all times, either sun, moon, or lamp light.

Mr. J. MACINTOSH.

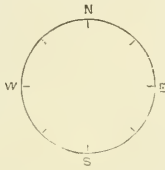
VII. The sound from the discharge of cannon.

Sounds in foggy weather are very unsatisfactory in practice, the acoustical property of air being then curtailed. By placing the sounding instrument (bell, &c.) in the focus of a long parabolic reflector or speaking trumpet, the longer the better, the sound would be conveyed much further to a point or points, but not to such a width as without the parabola. This latter would, therefore, require to revolve 360° or 180° to give all the points of the horizon the benefit.

From the well-known experiments on Lake Geneva, it was established that the sound given by a bell placed under water three feet, when struck with a hammer, was heard across the whole Lake, nine miles, when the car was placed under water, while the sound in air speedily died away.

Suppose a lightship with deep water all around, required to make known her position to a horizon of 360° or a rocky point ashore to 180° seaward.

In the centre of the lightship have a circular shaft or well, having trumpets three or four feet under water, diverging at the eight points of the compass. A powerful bell revolves, and a heavy blow is struck at each focus, the sound being confined to one point by a covering over the bell.



An observer on ship board puts over the side a "sea stethoscope," made of gutta percha, in shape like a huge tobacco pipe, the stem end having an ear piece, and the bowl being covered with a tightly stretched membrane of the same material. Query? Would our observer make out by sound the position of the lightship?

XIX., XX. Take advantage of streams running into the sea, or where the tides rise high, extemporise a salt water mill dam to apply water power to send a current of air to work a pneumatic engine, either on the beach or a little way afloat, to raise a hammer to strike a bell at regular intervals. Several combinations will occur, which would be self-acting, and require no further outlay beyond first cost, and occasional repair.

All know the piercingly acute sound producible from blowing across a common latch key. Imitate and extend that by having a whole battery of steel tubes, brazen lips, and intensely compressed air, all concentrated in the focus of a broddignagian brass trumpet, pointing or revolving seaward.

XXI. Level of the water, or even under water.

XXV., a. Make devices, numbers, or names, by means of sheet iron to be bolted to the lighthouse or beacon front; subject the iron to enamelling on both sides, milk-white, crimson, or black. The enamelling is in use to cover cooking utensils, &c. internally; no oxidation could take place, and the colours would be always fresh.

Prepare a quantity of morsels of cut glass (internally silvered?) from the size of a walnut down to a pea. Round the upper cornice of a lighthouse, give a coating of hydraulic cement; while wet, insert these gemlets, regularly irregular at all angles. The sun's rays would then be reflected from some of them at most times of the day to any point.

Imagine a lighthouse 250 feet high, dropped suddenly on a submarine bank in a placid sea; the commotion would create a number of undulatory concentric circles on the water. An observer on the lighthouse top would see, say 20, each a mile apart, the last being on the horizon.

Required a mode of sending the sun's rays striking on the top to all these circles, to all points of the horizon, and at all times of the day.

Suppose the sun vertical and stationary, then it would not be difficult by means of polished sheet glass, refracting and reflecting prisms, fixed or moveable, to send to observers on the circumferences of the circles bright reflections of the sun's rays.

The like might be done, the sun being on the horizon and stationary, or at any given elevation, and stationary.

Mr. J. MACINTOSH.

The sun's motion makes the problem more interesting and intricate; use machinery to give motion, say—

- 1st. An ascending motion, to move slowly downward, then flash rapidly back 90° .
- 2nd. Dissenting motion, move slowly westward 180° , rapidly back 90° .
- 3rd. Diurnal motion, to present the faces of the prisms at one unvaried angle.
- 4th. Annual motion, to be regulated every night.

Occasional substitution of mirrors, glasses, and prisms of various forms might be requisite; but it would occupy too much space and time to dwell on this. The occasional bringing out of the prismatic colours would make such an apparatus a beautiful object, especially perhaps at sunrise or sunset.

- b. Manufacture a device or number, say 3, twenty feet high, of a section 3 feet square, of the white enamelled sheet iron, into a trough or shape, place upright, glaze the front with ground glass, plain or coloured, the cross sash bars to be glass prisms, through the centre have a gas pipe, having burners at certain distances, with means of access from side, and ventilation to each. These for minor lighthouses and harbours.

45.

1, Hanover Chambers,
Buckingham Street, Adelphi.

SIR, 23d July 1860.

IN drawing the attention of the Royal Commissioners on Lighthouses, &c. to the "Universal Lime Light Company's Oxyhydrogen Lime Light," which they did the Company the honour to inspect at their chambers in Adani Street, Adelphi, I beg to observe that the adaptation of the lime light to the purpose of coast lighting is one of the primary objects which successive improvers of that system have had in view, as being one of the most important uses to which it could be applied.

Although many attempts have been made from time to time to obtain from this system a uniform and continuous light for a lengthened period, they have from the early attempts of Drummond to the present time, failed to realize such a practical result.

The Universal Lime Light Company have, however, been the means of successfully introducing this light in such an improved form, that it has been rendered steady and continuous for any desired period of time.

The eminently successful applications of it to the South Landing Stage at Liverpool during a period of two months, and likewise at the New Westminster Bridge during a somewhat longer period, have resulted in such an amount of experience, not only in the manipulation of the light, but likewise in the production of gases employed (viz., oxygen and hydrogen), which can now be procured at a cost little if at all exceeding that of ordinary coal gas. The probationary experience has likewise shown the probability of a still further reduction in the cost of the elements of the light, which, from its high illuminating power, will place it in such competition with coal gas, that its illuminating value for equal cost will be at least 50 times greater; its peculiar brilliancy, penetrative power, and high intensity conducing to this end.

In addition to the demonstrations already alluded to, the public will shortly have an opportunity of forming a judgment on its value for the important purpose of lighthouse illumination, as the "Universal Lime Light Company" have been directed by the Elder Brethren of the Trinity House to place their light in the South Foreland Lighthouse, to commence on the 1st of October ensuing.*

Other large and important applications of the lime light are now under negotiation, so that its introduction as a useful, economical, and permanent light may be considered as no longer a problematical or doubtful question in the science of artificial light.

* Universal Lime Light Company, Limited (Engineer's Department.)
363, Belvedere Road, London,
Dec. 3, 1860.

SIR, The looking over the proof of my evidence respecting the lime light, I have erased the date of exhibition at the South Foreland Lighthouse. It has been prolonged by circumstances over which the above Company have no control, but which will only cause a short delay in its completion, as the apparatus is in a very forward state, and in progress of erection at the South Foreland.

J. F. Campbell, Esq.

I have, &c.
AMH. H. RENTON.

Mr. A. H. RENTON.

With regard to its adaptation to buoys and beacons afloat, the Company are prepared to apply their light to such objects for a period of several consecutive days, in situations where there exist no facilities for daily communication.

I have, &c.,

AMHT. H. RENTON, C.E.

NOTE.—This letter was accompanied by the following answers to the questions of the Commissioners, and by a pamphlet containing observations on the lime light.

- I. AMHERST HAWKER RENTON, C.E., 1, Hanover Chambers, Buckingham Street, Adelphi, Engineer to the Universal Lime Light Company (Limited).
- II. Yes; I consider the oxyhydrogen lime light better adapted for the production of light for lighthouses and floating lights than other known methods of lighting in general use.
- III. Yes; the improvements made in the above light since the time of Lieutenant Drummond, and the experience in its use, render the contingency named a very remote possibility.
- IV. Reflectors are calculated to show the greatest possible quantity of light produced from any source or method of light; but it is questionable whether a combination of the catoptric and dioptric systems may not unite the peculiar excellencies of both, and produce a more perfect instrument than either separately.
- X. Red, for lights of extensive range; but the loss of light by absorption is very considerable, and sufficient to discourage the use of that mode of distinguishing lights where it can be avoided. Other colours green and blue, are sometimes used but with trifling effect.
- XIV. I consider the method of construction proposed by Mr. G. Herbert as best suited for floating lights, embracing the desiderata here enumerated. These light vessels are of a circular form, and moored at or near the centre of gravity.
- XV. *a.* I am of opinion that a modification of Mr. G. Herbert's system of mooring might be advantageously adapted to lightvessels of ordinary construction.
- XVI. *a.* I consider Mr. G. Herbert's hollow-bottomed buoys moored at or near the centre of gravity to be the best form of construction, and the most conspicuous as sea marks.
b. Ditto ditto.
c. An adaptation of the oxyhydrogen lime light which, by the use of compressed gases and a suitable arrangement of the lime wick, may be made available for two or three weeks supply, in situations where access can only be occasionally obtained.

46.

Admiralty, 19th March 1860.

It appears to me that these particulars belong entirely to the engineer, whose business I consider to be to see that this scientific detail (on which the real efficiency of the lighthouse depends) is properly carried out. I consider it his business to make the calculations on which the form involved by *a* and *b* depends, and having determined that mathematical form (either of lenses or reflectors), to instruct the maker accordingly, and then see himself when they are so made, that their positions in the building are really those which were intended for them. I consider that the maker has enough to do if he follows up correctly the intended form calculated for them, and that if such calculations be left to the maker they will become dead letters. Again, the manufacturer should always look to the engineer for his instructions in these matters as the person responsible for their accuracy. No doubt, after calculations are made of the figures required, tables and models might be made of the forms necessary,—tables and models might be constructed of them; but they should always emanate from the engineer in my opinion, who should be the responsible man, as the one really capable of conducting scientific investigation on scientific principles.

I know of no such data, having but a very limited acquaintance with lights or lighthouses from my constant pursuits in the hydrographic office.

A. B. BECHER,
Captain, R.N.

47.

Admiralty, 20 March 1860.

Not having made the questions here proposed subject of previous reflection, I speak with diffidence when I say that I do not attach much importance to them, considering that the adjustments could, in most cases, be made in the setting up of the apparatus by the relative position of the lamp, &c. Care, must, however, be taken that lights placed at great elevations be made to throw some rays in such a manner as to be seen by vessels at any proximate distance from them.

Geo. AUGUSTUS BEDFORD,
Captain, R.N.

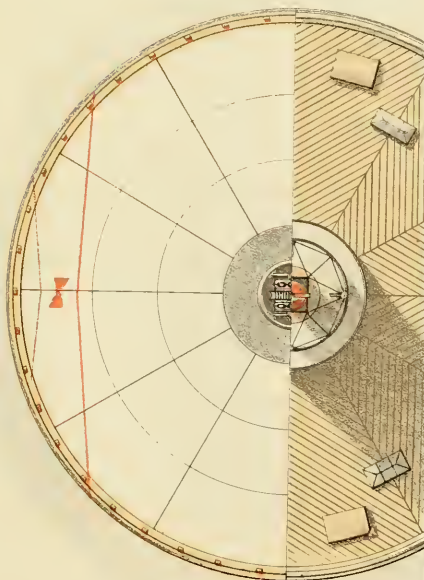
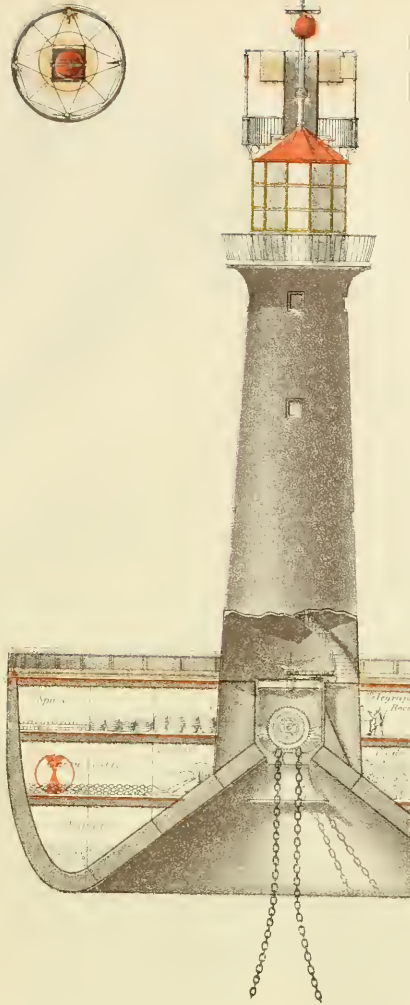
48.

- I. Sir DAVID BREWSTER, F.R.S., Principal of the University of Edinburgh.
- II. I consider gas to be in every respect superior to oil, and gas with oxygen as superior to either, as suggested by me in the *Edin. Review* in 1833. I have given reasons for these opinions in the *Edin. Review*, 1833, vol. lvii. p. 189 and 192, and *Edin. Trans.* vol. xi. p. 69. For new and cheap methods of producing oxygen, see *Comptes Rendus*, 26th November, 1860, p. 822, by M. M. Sainte Claire Deville and H. Debray.
- III. There is no danger which cannot be removed by proper precautions, and I am of opinion that gas may be safely substituted for oil.
- IV. I consider polyzonal lenses, or rather lenses in which the zones are composed of separate pieces, as superior to reflectors, whether of metal or reflecting prisms. The want of homogeneity in glass, when in large pieces or entire zones, makes the lenses imperfect. A zone composed of a number of pieces must be superior to the finest entire zone that can be made. I consider flint glass to be, for many reasons, superior to plate or crown glass.
- V. I consider the *Whole Light Apparatus* (or holophote), as described by me in 1812 in the *Edinburgh Encyclopaedia*, Art. BURNING INSTRUMENTS, and in 1827, in the *Edin. Trans.* vol. xi. p. 58, consisting of two polyzonal lenses, with smaller lenses and lateral reflectors and a spherical mirror in whose focus the light is placed, as affording the best means of illumination in lighthouses. If the mirrors are plated with silver by M. Foucault's method, their reflecting powers will be great, and their distribution of the incident light superior to what is obtained by reflecting prisms. I am of opinion that a spherical mirror, composed of flint glass prisms is greatly inferior to one made by M. Foucault's process. Every ray passes through a thickness of glass equal to the diagonal of the prism, and the slightest error in the angles of the prism will occasion an enormous deviation in the reflected ray from its proper direction.
- VIII. Coloured fluids may be advantageously used.
- IX. *b.* Coloured chimneys are very bad. The light should fall perpendicularly upon the coloured medium, whether solid or fluid. That is, the coloured medium should be bounded by spherical surfaces, of which the light is the centre.
- X. *a.* This is not a matter of opinion. It should be determined experimentally both for solids and fluids.
b. This depends upon the nature of the fog. Red light would be best in some fogs, and white light in others, supposing the light to be equal in intensity. A white beam of light deprived of all its colours but Red, by absorption, will not be so serviceable as the white beam itself.

ON THE EXHIBITION OF OCCASIONAL LIGHTS.

Assuming that a dioptric apparatus, illuminated by oil or gas, is sufficient for any lighthouse in ordinary states of the weather, it is desirable that in fogs an occasional light should be introduced, in order to increase the distance at which it can be seen.

The introduced light may be a Drummond light or an electrical one, or one of oil or gas rendered more intense by oxygen, or even one of oil or gas alone; and it cannot be doubted that if the range of the light should be extended a few furlongs, or even a few hundred yards, serious disasters might be prevented.



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SIR DAVID BREWSTER.

The mode of introducing occasional lights has been shown but not described in my paper on lighthouses.* Two methods of doing this are shown on Plate III., Fig. 1. In the first method the additional light is made to pass through the lamp or gas flame by the refraction of a lens, so that it is introduced into the principal beam as if it radiated from the flame.

But as the additional light thus employed is only the portion of it, intercepted by the lens, the figure shows another mode by which the *Whole Light* is introduced into the principal beam. This is effected by an ellipsoidal mirror whose foci are F. and T. The same effect may be produced by means of a small holophotal apparatus of lenses and mirrors, which, in place of producing a parallel beam, produces one which converges to F.

Although the two first of these methods are distinctly shown in Fig. 1, Plate III., yet they are not described in the paper in consequence of the note describing them having been lost by the printer, and the omission not perceived by the author of the paper; but to any person acquainted with optics the figure requires no description.

These methods are applicable to all lights that are either revolving or employed to illuminate only a portion of the horizon. No additional light can be introduced into fixed lights which illuminate the whole horizon, otherwise than by removing the ordinary light, and substituting a stronger one in its place, or by increasing the intensity of the ordinary light by oxygen gas.

ON FIXED LIGHTS WITH MANY FLAMES.

In fixed lights where a single flame is placed in the focus of the dioptric apparatus, we are limited to a flame of oil or of gas of a certain size.

In order to get rid of this limitation and to obtain a more powerful light, I propose to construct the dioptric apparatus so that its focus is not a point but a circle or ring, and in this circle or ring I would place a number of lamps or gas flames, which would produce a light of great intensity. The refracted beam would, of course, consist of a combination of parallel and converging beams, subsequently diverging, but notwithstanding this convergency a very brilliant light would be obtained, especially with gas flames.

The additional expense occasioned by additional flames will not be grudged by those who know the value of the life and property which are risked at sea.

ON FIXED LIGHTS WITH ONE FLAME.

In fixed lights with one flame in the focus of a cylindrical belt of refractors there is no refraction in a horizontal plane, and consequently no condensation of light in that plane. This is unavoidable if an uniform belt of light is necessary, and if the apparatus is absolutely fixed.

In order to obtain a brighter light from the same flame, I propose to place the lenses in a polyzonal frame, and to illuminate the obscure azimuthal spaces in one of three ways:—

1st. By having a flame in the focus of each lens, so that each lens may throw into the obscure azimuths the slightly converging beam which is produced from the lamps out of its focus.

2nd. By giving an oscillatory motion to the lenses in a horizontal plane when one flame is used.

3rd. When a ring of flames is used to give such a motion to the ring that each flame passes through the common focus of the lenses.

The value of these suggestions can only be ascertained experimentally.

ON DISTINGUISHING LIGHTS.

In the use of colours for Distinguishing Lights it is of great importance, when the colour is red, to obtain a red which is different to the eye, and also different in its composition, from the red produced by the absorption of a haze or fog. It may be difficult to find a red which shall appear different to the eye; but it is easy to obtain one different in composition. We may obtain a red, for example, which is composed of red or blue light, and when this is examined by a prism, it will be separated into two distinct portions, a red and a blue. We may obtain compound colours which the prism will separate into three, four, or more portions of light, and thus give a numerical character to the light.

A numerical character may be obtained also from an analysis of the spectrum produced from lights coloured by thin plates.

Or by using polarised light, coloured or uncoloured, from which many distinctive characters may be obtained.

Or by the analysis of polarised light after passing through thin crystalline plates, such as those of sulphate of lime or mica.

SIR DAVID BREWSTER.

The value of these suggestions can be ascertained only by experiments carefully conducted.

HOW TO OBTAIN COLOURS OF ANY CHARACTER OR COMPOSITION FOR DISTINGUISHING LIGHTS.

For catoptric lighthouses the coloured glass employed must be in large plates covering the mouth of the reflectors, and hence it is impossible to avail ourselves of media of which large plates cannot be obtained.

For lenticular lighthouses much smaller coloured plates are required, and we have, therefore, a greater range of media to submit to experiment.

In order to obtain any particular colour for distinguishing lights we cannot do it by the superposition of plates of different colours, as that would absorb too much of the incident light; but we may obtain it by placing side by side small areas of coloured glasses, coloured fluids, coloured gelatine, or even coloured minerals.

If we require a coloured plate for reflectors we can obtain one of any colour we choose, or of any composition we choose, by forming a square or circular plate of ten, twenty, or any other number of different pieces, and all the colours which those pieces produce will be mixed together in the general beam projected from the lighthouse.

These pieces of differently coloured media may be cemented on one plate of glass with Canada balsam placed between two plates. Portions of coloured fluids might be placed in flattened or spherical bulbs, or even in flattened or cylindrical tubes.

In the lenticular lighthouses the same thing may be done, the different portions of coloured media being combined in a spherical surface, and in this case the colours will be more completely mixed by the refraction of the lens.

The colours of thin plates obtained by M. De La Rue's process might be obtained in sufficiently large portions to be combined either with one another or with portions of differently coloured media. When combined with one another these coloured plates would give, by the analysis of a prism, which might be placed at the eye end of a telescope, a spectrum divided into 2, 3, 4, 5, 6, or any other number of parts.

I consider the method above described of obtaining any colour for Distinguishing Lights as likely to prove of much practical value.

APPENDIX.

I have had occasion to make various suggestions applicable to the improvement of Lighthouses in the following works:

1. In a Treatise on BURNING INSTRUMENTS, containing the method of building large polyzonal lenses, and a description of *Whole Light* apparatus, or holophote, for increasing the intensity and size of the refracted beams. This treatise was published in 1812 in the *Edinburgh Encyclopædia*, vol. v., p. 140-143.
2. On the construction of polyzonal lenses and mirrors of great magnitude for Lighthouses, and for Burning Instruments, published in the *Edinburgh Philosophical Journal*, January 1823, vol. viii., p. 160.
3. Account of a New System of Illumination for Lighthouses, published in the *Edinburgh Transactions*, vol. xi., p. 33, Edinburgh 1827.
4. On the British Lighthouse System, published in the *Edinburgh Review*, vol. lvii., p. 169, October 1833.
5. Review of the Parliamentary Report on Lighthouses, published in the *Edinburgh Review*, vol. lxi., p. 221, January 1835.
6. Observations on the Distinguishing Coloured Lights of the Bell Rock Lighthouse, published in the *Edinburgh Review*, vol. lxi., p. 526-533, July 1835.
7. Memorial on the New System of Dioptric Lights, addressed to the Right Honourable the Lords Commissioners of Her Majesty's Treasury, 1859.
8. On Lighthouses, Life Boats, and Lightning Conductors, published in the *North British Review*, for November 1859, vol. xxxii., p. 492.
9. On the British Lighthouse System, published in the *North British Review* for May 1860.

Various suggestions and descriptions of apparatus, and comparisons of lenses and reflectors, &c., applicable to the improvement of Lighthouses, were communicated by me to the Scottish Lighthouse Board between 1825 and 1835, and recorded in their minutes. I have been refused copies of these documents on the ground that the clerks were much occupied; but some of them have been printed in the APPENDIX to the *Report and Evidence from the Select Committee of the House of Commons on Lighthouses*, August 1834.

* Edin. Trans. vol. xi., 1827.

49.

Observatory, Washington
15th December, 1860.

SIR.

IN reply to the circular letter of the "Royal Commission on Lighthouses, &c." requesting information on certain points connected with the subjects before them, I beg leave to address myself to their 23rd question.* In answer to that, I have the honor to state:—

That a system of daily weather reports by telegraph has been adopted by England and France acting in concert, which promises to be of great advantage in giving warning of approaching changes of the weather, especially of those wide-spread and devastating storms which so often visit the British Islands. This system has been but recently adopted; indeed, it is not yet fairly under way; but the perfection to which it has been carried in Holland, and on a much less comprehensive scale, the nature of the problems connected with it, together with the character of the men charged with giving it practical effect, justify sanguine expectations on the part of those who are striving to lessen the dangers of navigation.

For full information as to the system in all its details, as far as it has yet been carried, I beg leave to refer the Commissioners to Admiral FitzRoy, R.N., of the Meteorological Department of the Board of Trade and Admiralty, who is specially charged with the subject in England. The information most desirable to passing ships, as well as to ships in the offings and ports, would be that relating to the coming storm, and the approach of good weather after it, with the direction of the wind, &c.

There occurs annually in English waters, and within signal distance of British shores, an amount of shipwreck and disaster that is truly appalling. A single storm has been known to wreck or damage several hundred sail and to destroy many lives.

Now, most of the storms of this class, modern research has shown, have their line of march. Taking up this line at one place, one of these storms may, and not infrequently does, occupy one, two, three or more days in traversing the region over which the indefatigable chief of the Meteorological Department of the Board of Trade has posted his *sentinels* upon the weather, as his telegraphic observers may be called. As soon as his outposts are properly occupied, and his plans completed, he will be able to give warning, timely warning, of the approach, if not of every one, at least annually of several of these storms. And in all such cases, whether they be many or few, a greater boon could not be rendered to commerce and navigation than by communicating this warning to the shipping in the ports of the realm and off its coasts, through bulletin boards at suitable places in the ports themselves, and by signals from prominent lighthouses in the manner suggested by the interrogatory of the Commission.

It is difficult to enforce by argument what is obvious to reason; but I may be pardoned for illustrating the advantages which the use of the telegraph as a meteorological implement, and which the warnings by signal in the manner proposed, promise to afford to shipping. In the first part of last October, I believe the 5th, for I now speak from memory, no less than five of the fleet of steamers that ply between the shores of Great Britain and the Baltic perished, themselves and their crews, in the same gale of wind. They all put out from Hull the same day for St. Petersburg, and not one of them has been heard of since. There is scarce room left for doubt that if Admiral FitzRoy's cordon of weather sentinels had then been in proper training,—there is scarce room left for doubt that if the gallant Admiral had had time to perfect the system of daily weather reports, which at the moment he was actually arranging, and with the perfecting of which he is still engaged,—there is, I venture to repeat, no doubt that if this admirable plan had been brought to the perfection which time and experience are sure to impart to it, those ill-fated vessels might have been warned of the impending danger either before leaving port, or while yet within lighthouse signal distance of the British shores.

What system of signals should be adopted by which the lighthouses may warn the shipping in the offings to seek shelter cannot be now as well discussed as perhaps it may after we shall have learned by actual experience what is the precise character of the warnings which the system may enable us to give.

But as France and England are carrying on this system of telegraphic meteorology in concert, and as other maritime powers also will no doubt unite in giving it both efficiency and effect, it would appear that the code of signals should not only be as simple as possible and convenient, but the signals themselves should be such also as to the marine of all countries shall prove equally convenient. So that when the signal to "seek shelter" is made by the lighthouses of any coast, it should be alike intelligible to all vessels of every flag. Not only so, the vessels themselves as they fly for shelter should each be required to repeat the signal as she flies, thus giving warning of the impending danger to others which may be beyond the reach of the lighthouse signal; and this flying signal again to be effectual should, like that for a pilot or of distress be simple; it should be capable of being readily made by means that are common to all vessels.

Our knowledge of meteorological phenomena and laws is to be increased precisely as the area is increased over which a united system of daily observations, of friendly co-operation and research is extended. In this view, it is not only desirable that every country should assist in bringing the magnetic telegraph into the service of this science, and through it into the service of navigation; but it is also desirable that the system of general co-operation, which at the recommendation of the Brussels Conference has been adopted for the sea, should be extended so as to embrace the land likewise. There can be no doubt that our knowledge of the laws which govern the shoreless ocean, on the bottom of which man has his habitation, is to be enhanced as more and more of it is subjected to systematic observation and discussion. As this knowledge advances, so will the value of this new code of signals by telegraph and lighthouse be enhanced in the cause of humanity.

Great Britain more than any other nation has practically the greatest interest at stake in this proposed application of lighthouses to the purposes of meteorology. She curtains the western coast of Europe, she is its great commercial centre. All vessels sailing on the Atlantic from any of the continental ports, between Ushant and the White Sea, pass her offings on the outward voyage, and take departure from her cliffs. On the homeward passage, the first land-fall is some British lighthouse, headland, or islet. Moreover, those islands, unlike the coasts of any other of the great maritime nations, present in every gale that visits them a lee shore. So that it is of more importance to the commerce of the world that Great Britain, in preference to any other nation, should take the lead in encouraging meteorology, in bringing the magnetic telegraph into play as an adjunct of navigation, and in causing the lighthouses to utter its warnings to vessels as they pass.

Having the ability to give warning from the lighthouses of the approaching storm and failing to use them for the purpose, would be like surveying a dangerous shoal or reef in the "fair way" of some one of her ports, and then failing to publish a chart of it; or like publishing a chart as of the harbour of Liverpool, and then failing to mark out its channel-way and dangers by beacons or buoys.

As beacons or buoys are used to mark out invisible dangers in the water, so with equal propriety may the lighthouses and light-vessels be used to give warning to mariners of dangers in the air equally invisible, but none the less real for that.

There is another reason why Great Britain, perceiving the advantages of the measure, should not be slow in giving it effect in her own waters, and that is,—her vessels, seamen, and subjects, more than those of any other nation, frequent all the trading ports of the world. Her example in all that tends to benefit commerce or improve navigation is of great influence with the world. Let her adopt this plan for her own coasts, and distant nations heeding this influence will not be slow to follow after and adopt it for theirs also; and thus British shipping will have the full benefits of the system abroad as well as at home.

Pray pardon me for urging with so much earnestness a subject which I am sure sufficiently commends itself without argument to the favourable consideration of Her Majesty's Commissioners. In my humble way I have been advocating the establishment of a similar system of weather reports and telegraphic warnings, not only for the shipping, but for the farmers also of the United States; and the action which the Royal Commissioners may recommend Her Majesty's Government to take in the premises will not be without its influence here.

Respectfully, &c.

M. F. MAURY,
U.S.N.J. F. Campbell, Esq.,
&c. &c. &c.

* 23d. Supposing the telegraph to be extended to certain lighthouses and lightvessels at salient points of the coast, what is the meteorological information which it would be most desirable to transmit to passing ships, and how and in what form could it be most readily received and communicated by lightkeepers?"



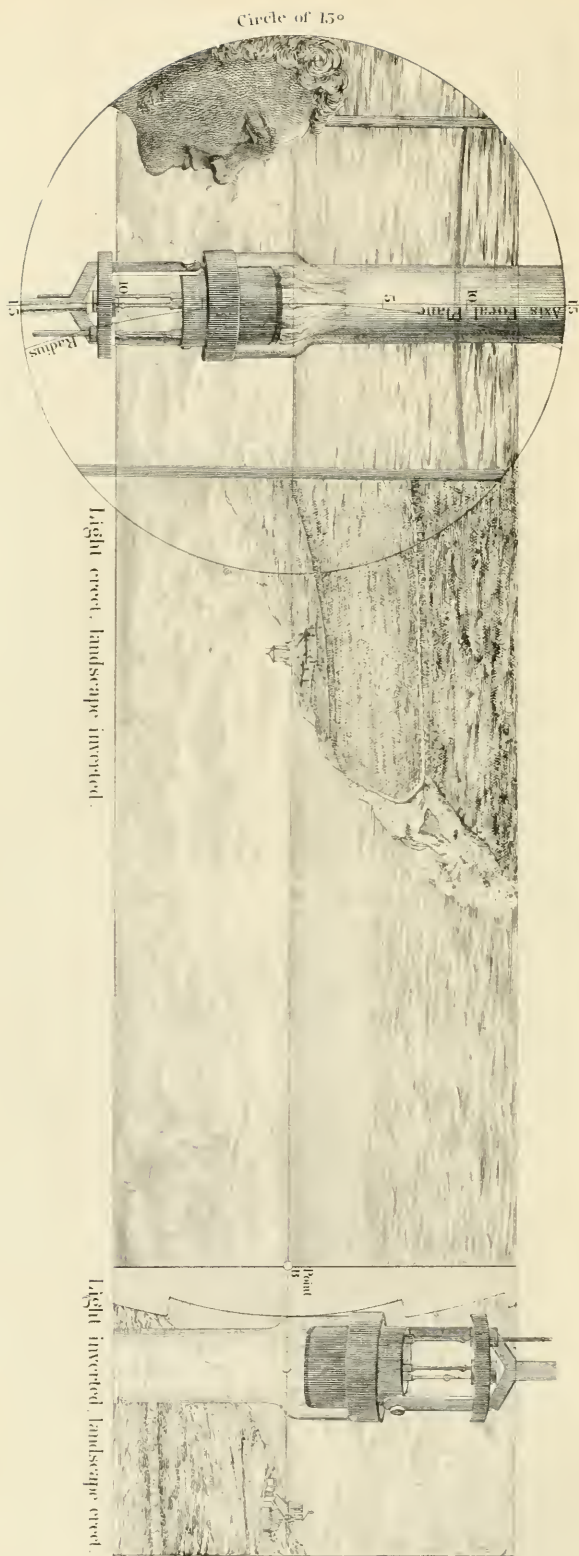
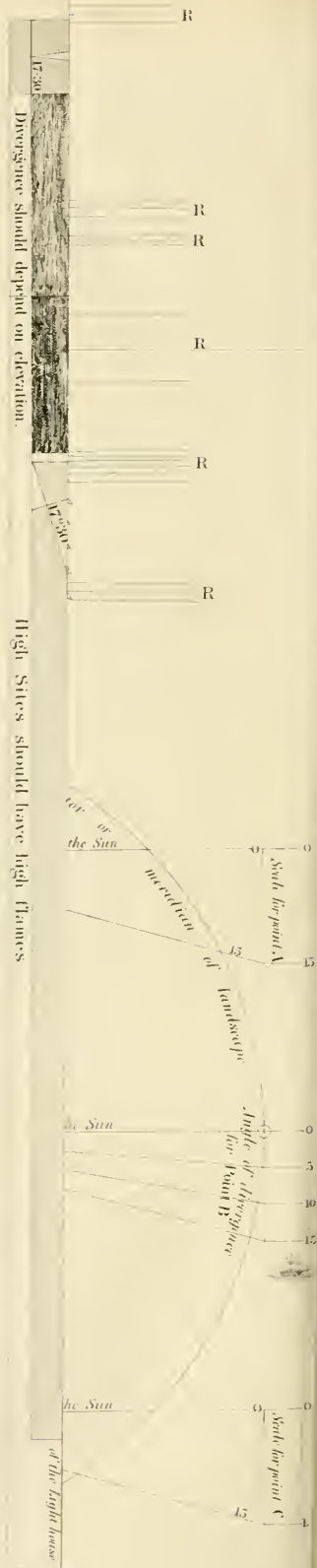
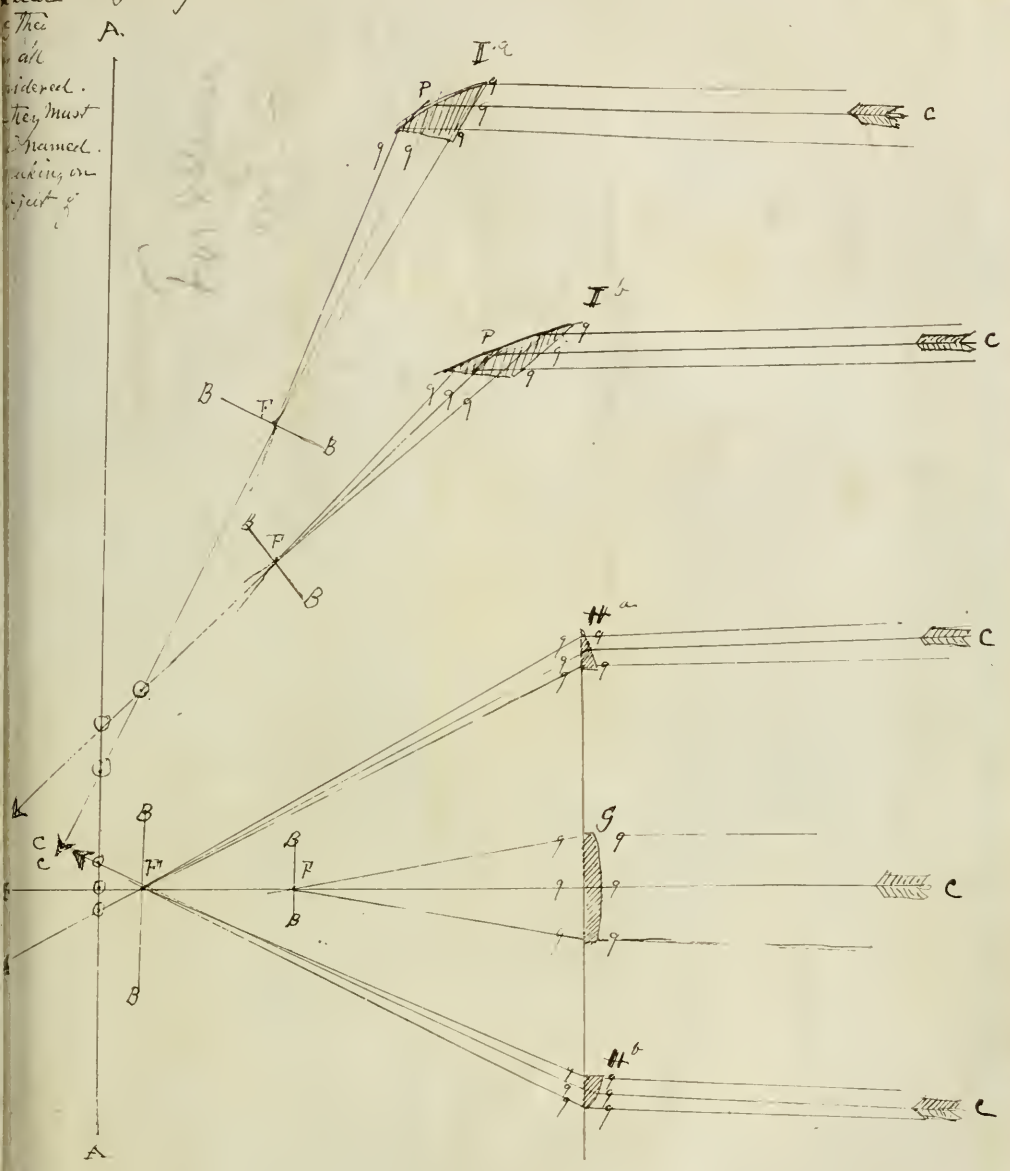


FIG. 3.
METHOD OF INTERNAL OBSERVATION



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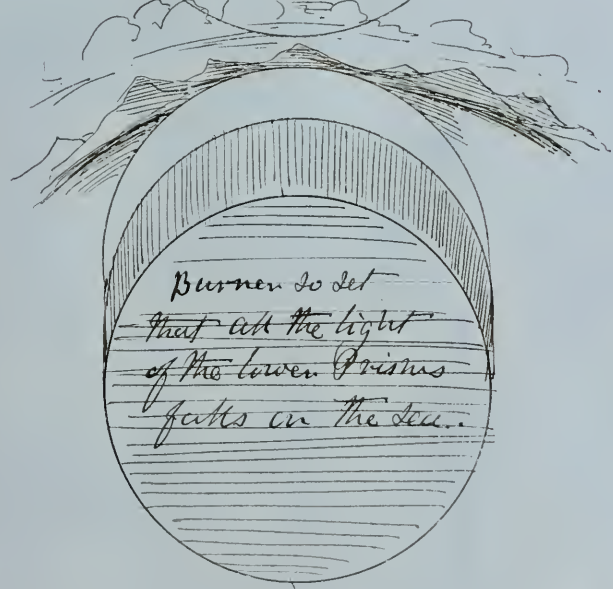
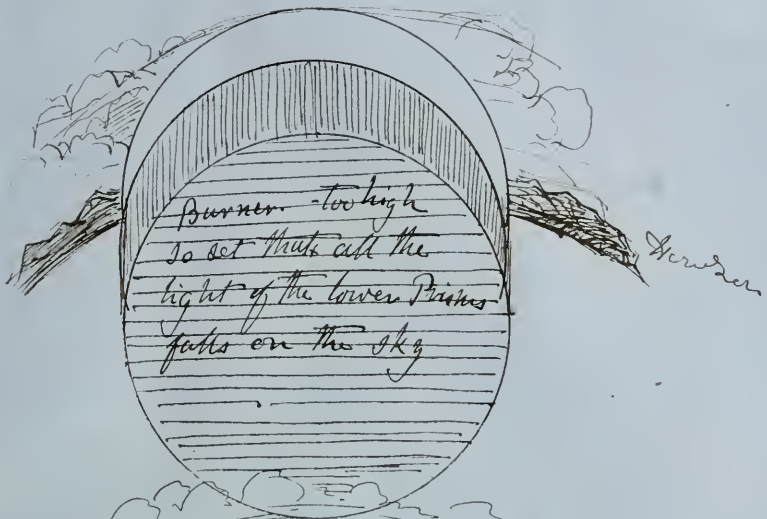
- AA axis
- BB Focal Planes.
- CC axes of Pencils.
- F Focus for parallel Rays.
- G lens or lenticular zone.
- H dioptric bands or rings
- I^a I^b catadioptric Prisms or rings
- O Points of intersection.
- P angle of reflection.

θ angle of Refraction

Examples.

- \circ $I^a I^b C-C$ Point of intersection of axes of pencils from catadioptric Prisms. a. b.
- $\underline{BB I^b}$ Focal plane of Prism b.
- $\underline{F I^b}$ Focus of upper Prism b.
- \circ AA #^a C-C. Point of intersection of axis & axis of pencil of dioptric Pencils. #^a #^b







Make
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20' elev

South West
 The level is made of the same material as the level of the same name - 1860

Sunt Rayi
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 Sunt Rayi

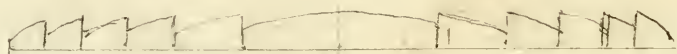
Sunt Rayi

Sunt Rayi
 Sunt Rayi

1860

20'







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a number and a letter
 added on each buoy will enable the
 Mariner to identify his position
 whenever he can see the Buoy -

J. Campbell

November 19 / 59

A Buoy, marks danger. —

Form
 direction in
 which the danger
 exists.
 Colour

{ Curve North -
 curve below & angle above East
 angle South
 angle below curve above West

{ Black means East
 Black & Red below Red above. South
 Red. West

Red one side Black the other & horizontal stripes North

From a distance
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Royal Commission,

Lights, Buys, and Beacons,

7, Millbank Street, S.W.

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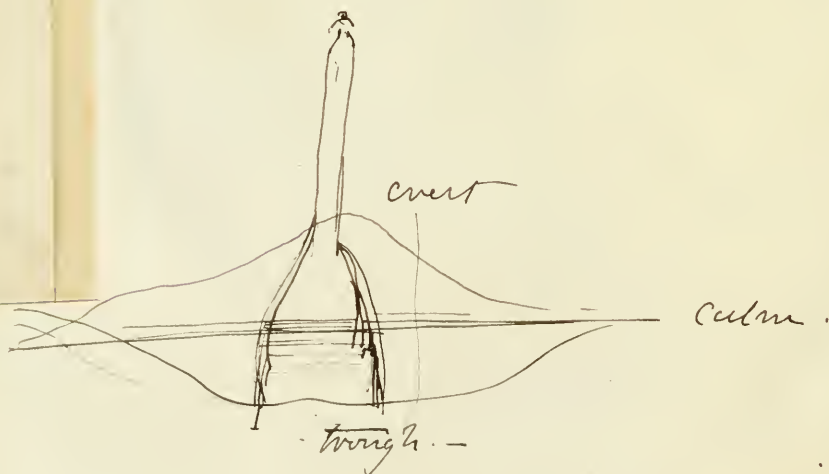
July 23rd / 60

~~JA~~

Things etc of some
months ago -

Fog signal.

Proposed that at Rock stations
there be constructed a whistle
to be worked by the swell of the
sea



a tube would be all that required -
or a machine to be wound up by the tide.



Recd May 20 1867. after the passage of
Protest & Res. See nothing to change within 14 days
an right to see as it goes. —

R. Campbell

CIRCULAR IX.

I.—J. F. CAMPBELL, Secretary to the Lighthouse Commission, Nidry Lodge, Kensington.

II.—(1st.) As to "quantity of light." Whether a ray of light consists of "infinitely swift corpuscles" or of "vibrations," it is something which can be measured by quantity, if a measure can be found. A ray of light, so far as it is understood, is either moving matter or matter moved; matter moving like the fragments of an exploding shell; or matter moved as air is moved by an explosion, or as the surface of still water is moved by dropping a stone into it.

It is hard to measure light, but easy to measure that by which it is produced; and it seems reasonable to assume that a given quantity of "corpuscles" or a certain number of "vibrations" only can be produced from a given quantity of material by a given process.

It is hard to measure a passing fragment of a shell, to say how fast it moves, how big it is, where it is going, and when it will stop.

It is hard to measure waves of sound, and to say when and where they will cease to be heard; or to take the height and depth and shape and velocity and direction of passing waves at sea, and to say when and where they will cease to exist as waves, and the water again be calm. It is harder still to measure light, but it is easy to measure the gunpowder which explodes a shell, and causes waves of sound; or to weigh and measure the stone which produces waves on still water, and to estimate the force with which it strikes the water. It is easy to measure a known cause which produces certain effects, and so a rough measure of light may be got by measuring the fuel by which it is produced.

The time occupied in completing the chemical changes which result from the burning of so many gallons of oil and yards of wick, or of so many tons of coal, gives another rough measure for intensity.

It is probable that a definite amount of force is produced, while the condition of a given quantity of solid or liquid matter changes, as coal or oil changes while burning, but the amount of force is probably the same, whether it is produced all at once as by an explosion of gunpowder, or during a year as by burning oil at intervals in a lighthouse lamp; or during so many months, as by burning coals in a steam magneto electric machine; or during so many hours, as by dissolving metals in a galvanic battery; and when power is shown as visible light, it seems fair to measure light by power, and power by that which produced it, and therefore, to measure light by measuring fuel.

The quantity, therefore, of fuel consumed at a lighthouse in the year is taken as the measure of the light produced during that time.

This principle has been applied in the diagram which shows the consumption of oil at each lighthouse station, and from that diagram and from the answers to Circular III., and by a reference to a good map, the money value of the light lost at a given station may be roughly estimated thus:—

The light at the Point of Ayre burnt 519 gallons of oil in 1857, which cost 4s. 1½d. per gallon. It is a revolving light and shows all round. Of a circle of 360 degrees on the horizon the land occupies about 100 degrees. There is consequently a clear loss of $\frac{100}{360}$ parts while the light shines on the land, the remaining 260 horizontal degrees are illuminated by a beam, of which more than one-half shines on the sky, and is wasted and lost vertically by divergence and wrong direction. From 260 parts 130 are to be taken, and of 360 parts there remain but 130, usefully applied, as against 230 wasted. The proportion being ascertained may be converted into oil and its price. The whole = 360 : gallons of oil, price of the same :: the loss = 230.

In the case in question, the loss of light equals 331 gallons, worth 68l. 5s. 4½d.

At every station in the kingdom where the old reflectors are used, at least one-half of the light produced shines on the sky, and at many stations the loss on the land is much greater than it is at the Point of Ayre.

2d. As to method of producing light.—Burning coal.—I do not think that the best method of producing the greatest possible quantity of visible light from a given quantity of fuel is yet known, but burning a ton of coals in the open air, in an open iron basket, is one method which was commonly used for coast illumination a hundred years ago; and burning the same quantity of coal in a much longer time, in a steam magneto electric machine, is another method lately introduced; and the new method is a great and manifest advance in science, and is probably capable of still further improvement.

If a ton of coal be the standard measure of light, and its

price the measure of cost, the best and cheapest method yet known for using that fuel to produce light is probably to burn it in a steam magneto electric machine. An open coal fire at South Foreland to be as clearly seen at Boulogne as the electric light would consume many tons, and would cost more than the maintenance of a steam engine, and the pay of engineers.

A ton of coals may also be burned so as to produce light in other ways. For example, one portion may be used to convert the other into gas, and the gas may be burned to give light; and there are many lighthouse stations near which coal gas is so manufactured, and where a ton of coals converted into a given number of cubic feet of gas may be purchased, and under certain circumstances, the manufactured article (gas) may be more cheaply and advantageously used than the raw material (coal).

It is better and it may be cheaper to burn coal gas in the best possible burner, than to burn coal in an open grate; but it is still better to use that fuel to move machinery and produce the electric light, but it would be waste of power to use that light for harbour lights.

It may be better even to make and use gas, for example, at sea, where the lamp moves and oil spills.

Oil.—If oil be the standard fuel, and a gallon the quantity, and its price the standard of cost for light, the best machine used for burning oil for lighthouse purposes is the four-wicked burner, with four wicks and a mechanical lamp; it is used in France and Scotland, and of late it has been introduced at a few stations in England.

The machine is capable of improvement, and the subject is a study of itself, which depends on all that relates to combustion and ventilation, the movements of currents of air, in closed rooms, in chimnies, and in tall shafts, such as the lantern of a lighthouse, the chimney of the lamp, and the lighthouse tower.

It has been proposed to convert oil into gas in a retort heated by coal, to compress it, and to burn it in a gas-burner at the lighthouse or floating light.

This entails many operations, and it seems better to burn the oil simply and at once, and to save coal and machinery and labour. A good lamp is probably the best machine for burning oil, so as to produce light at small cost.

It is also proposed to produce light by burning two gases together, and heating lime with the flame, and for this purpose to convert oil into one of the gases required. This form of lime light is, like the oxy-hydrogen lime light, which is commonly used, and experiment alone can decide which of these is best, whether either is better or worse than the electric light, or whether anything still better can be devised for lighthouse illumination.

In the meantime my answer to this question is,—

First, burning coal in the steam magneto-electric machine, at stations where there is room for machinery, where coal and water can be easily got and stored, and where ready help is at hand in case of accident to the engine; a reserve oil lamp to be always available, and existing apparatus fitted for oil lamps to be preserved till further experience makes the action of the new light more certain. The new light should have its own optical apparatus.

Second, burning coal gas in existing optical apparatus where good gas can be purchased and readily supplied, and where the supply is sure. Reserve oil lamps to be preserved in case of accident.

Third, burning oil as at present, in the best mechanical lamp, and with the best ventilation known, at out stations, where communication is difficult, help far off, and transport expensive, because a gallon of oil is the most portable and useful form of fuel for producing light, or if the expression might be used, the most portable form of light as well as the readiest measure of the quantity of light produced.

III.—I do not think the electric light now applicable to distant rock stations, because of the machinery connected with it, but when it has been more tried and is better understood it may perhaps be generally applied.

I do not consider it advisable to use coal or oil gas at such stations because of the difficulty of manufacturing it there, or of transporting it in a condensed form in closed vessels from the place of manufacture.

Oil seems to be the best fuel known for rock stations or for shore stations difficult of access, but a better fuel than oil may be discovered.

IV.—V.—For using a given "quantity" of light to the IV. and V. best advantage, that is for directing rays, as much as is now possible, to those places only where they may be seen by those for whose benefit the light is shown, and not else-

Magneto-electric engine.

Coal gas.

Oil gas.

Fitzmaurice light and lime light.

III.

4 K

Wm. H. 4/3/1861

Protest & Res.

an right to see as it goes.

where, a combination of lenses or refracting bands, refracting and reflecting glass prisms, and reflectors of glass or metal.

Many such combinations exist, and many more may be devised. They pass by the general names of the dioptric system and catadioptric apparatus; the system is capable of improvement, and has been much improved since its first adoption.

VI.—By a little contrivance there seems to be no difficulty in applying the dioptric system to floating lights. A structure like the funnel of a steam boat might easily be added to floating lights, and small apparatus might be swung and balanced so as to preserve a sufficient level.

Supposing oil gas to be substituted for oil, it might perhaps be manufactured below, and burned above as fast as made. Oil gas is now made in a small iron retort in a common fire by Mr. Copcutt for the Fitzmaurice light. The apparatus occupies a very small space, and might perhaps be used afloat.

Fig. 1 may help to explain what is meant by a catadioptric apparatus, and to indicate the complicated optical problems involved in its invention and manufacture.

The foci are all purposely displaced, to show what has to be accomplished in bringing the foci of each bit of apparatus, and the axis of each pencil of light to its proper place and direction with reference to the source of light and the requirements of the locality.

It will be manifest from an inspection of Fig. 1 that errors may arise in making, setting, and fixing such a complicated optical machine, and in placing the source of light in it. The following is a description of the method which has been adopted by the Commission in examining such apparatus, with the view of discovering whether such errors existed, and they are good enough to say that the method was "devised by their Secretary."

The first idea of a dioptric lighthouse apparatus appears to have originated in a burning glass. The "device" is nothing but a return to first principles.

A ray of light follows the same path through a given series of optical apparatus, whether it travels from A to B or from B to A.

The sun's rays and rays from distant objects may be taken as parallel rays, and such rays are refracted and brought to a focus at a certain distance behind a lens, which is called the chief focus, when the sun's rays fall at right angles to the surface of the lens. The rays form an inverted image of the sun, or of a distant object, such as a ship at sea, and that image may be shown on a plane surface. If an artificial light of the same dimensions as the sun's image be placed where the image of the sun is formed, the rays which start from that source of light and fall on the lens will travel back along the same paths which were followed by the rays of the sun, and a beam of light will emerge from every point in the lens with a vertical divergence equal to the sun's apparent diameter, which is about half a degree. The axis of each pencil will pass through the centre of the lens, which is marked as "point b" in Fig. 2, in a direction corresponding to the positions of corresponding points on the sun and in its inverted image, and if the lens be a fixture, the image of the setting sun will move upwards as the sun sets, and to the left when the sun moves to the right, and the axis of every pencil will appear to move about the central point of the lens, as if that point were the fulcrum of a lever, or a pin-hole in a window shutter, through which a pencil of the sun's rays entered freely.

By drawing straight lines through "point b" (to represent the axial rays of the pencils of light) and producing them both ways till they cut the circle, a double scale of degrees is obtained; by producing these lines till they cut the perpendicular, which represents the photographic plate in a camera, a scale of degrees is obtained for every picture formed on a flat surface by a truly spherical lens whose focal length equals the radius of the circle. And thus by placing two transparent photographs taken with such a lens, a positive and a negative, in the positions indicated by the scales, a single ray of sunlight would pass through pinholes made in corresponding points in the photographs, and through "point b" in the lens. The lenses commonly used for photography are not spherical, and the pictures taken with them on flat surfaces are distorted, but for five degrees on any side of the focus the distortion is slight.

But because a large lens is used in a lighthouse, the rays which meet at the focus diverge greatly when they have passed beyond it, and that angle of divergence depends upon the size of the lens. It is taken at 70° on the authority of official drawings of first order apparatus.

An observer whose eye is placed seven or eight inches beyond the focus, and who looks at the sun on the horizon through such a lens, may move his eye through an angle of 70°, and continue to see the sun through the lens.

The sun will appear to him to traverse the lens; upwards when he lowers his head, and downwards when he raises it; but if a screen of ground glass or paper is interposed at the focus for the sun's rays, the sun will no longer seem to move when the observer's eye is moved, it will be stationary as regards the lens, but it will move on the screen as the sun seems to move, and in the same proportion, though in an opposite direction.

A lighthouse lens is in fact a camera obscura on a large scale, and that which is new in the method pursued by the Commission in testing apparatus, and which they are good enough to say was devised by their Secretary, consists in treating the lighthouse lens as if it were a photographic camera, and in using photography as an illustration.

The diagram, Fig. 2, will explain the principle. It is taken from a larger drawing made in July, 1860, which was taken from diagrams made long before. The circle described about a point in the centre of the lens, is common to the image formed within the lens, and to the real landscape outside, and may be taken to represent the horizon, the equator, or a meridian. When the sun is on the geometrical horizon, the image will be on the corresponding point, and on the geometrical horizon of the image of the landscape. A ship 17 degrees below the horizon, and on the meridian, will appear inverted on the meridian of the image, 17 degrees above the image of the sun, that is above the chief focus; and if it is desired to send light to that ship, light must be placed where the image appears, or within the double triangle formed by the refracted rays which cross and make the image, and so with every part of the distant landscape of which the photographic camera would take a picture, and of which a lighthouse lens forms a rough image.

Fig. 4 is intended to show that in order to illuminate an angle equal to the apparent angular distance from the crest of a near wave to the horizon, flames set in the chief focus of a lens must bear a proportion to the elevation at which a light is placed. The landscapes are taken from photographs, the one taken from an elevation of about 18 feet above the sea level in the Isle of Wight, in April 1858, the other taken at Whitby, 240 feet above the sea, in August 1860. The breaking waves shown in the foreground were at nearly the same horizontal distance in both cases. In the one case, a flame equal in altitude to 2° on a circle where radius equals the focal length of the lighthouse lens, would coincide with the image of the sea, and throw light upon it through the lens. In the other, the flame would require an altitude of 17°, which is double the height of the largest lighthouse flame used.

The drawing from which Fig. 2 is taken was made to illustrate the proposition of which Fig. 4 is an illustration, namely—

"That in lighthouses the diverging beam whose axis or central plane is at right angles to the perpendicular axis of the instrument, and has equal divergence above and below that plane in which its axis or central plane lies, is wrongly directed. That it should be directed downwards, its upper limit to a point a little above the horizon, and its lower limit as near to the lighthouse as the divergence will allow."

This proposition was originally stated for the consideration of the Astronomer Royal, and it was allowed by him to be generally correct, on returning from the Start Lighthouse. The drawing referred to was shown to the Astronomer Royal, to Mr. Stevenson and Mr. Chance, on the 2nd of August 1860, and it is admitted to be correctly drawn. It is now agreed that the brightest part of a light-house beam ought not any longer to be directed to the geometrical horizon, or above it, but there is still a question of expediency under debate, whether the brightest light should be thrown on the visible horizon or on a point at some distance within it. My own opinion was expressed in the proposition quoted, but it is a nautical question, and it should be decided by practical men.

If the atmosphere is sufficiently clear for the light to be seen on the horizon at all, it will probably be seen, though the brightest part of the beam falls on the sea somewhat nearer to the tower than the horizon. If the atmosphere is thick, as it usually is in England, it is best, as it seems to me, to throw the best light on the point where it has the best chance of being seen.

Fig. 6 is a contrivance for increasing divergence downwards without altering the flame or the apparatus; by adding one plane mirror or two if required.

There are many other ways in which the same end may be attained. For instance, a plane mirror properly placed behind the lamp and sloped forwards, will produce the effect of a lamp placed behind the real lamp and above it. The reflected rays will be refracted by the lens to a focus outside, and will then diverge, and the axis of the beams will dip. A plane mirror placed behind the lamp so as to reflect rays on the lower prisms will, in like manner, produce a

VI.

Fig. 1, catadioptric apparatus.

Method of observation.

Fig. 2.

Fig. 4.

Fig. 6.

dipping beam. The experiment was tried at South Foreland, and a strong light was thrown on an observer close to the tower, while the direct rays of the lamp continued to be thrown by the same prisms to the geometrical horizon far above the most distant observer at sea. Plane mirrors may be similarly arranged for the upper prisms. A small additional lamp placed where the reflected image of the lamp appeared to be placed would also give a dipping beam for the near sea, but perhaps the simplest plan of all would be to remove the lower prisms, and replace them with a sheet of glass, and to allow the lamp to radiate freely downwards within a certain angle.

At all events if a particular object outside the lens can be seen from any point within it, a light placed at the point where the observer's eye was situated will certainly be visible from the object seen.

I have used a large plano-convex lens, placed convex side upwards on the burner. It forms a kind of reflecting eye-piece for the whole catadioptric apparatus, and enables the observer to judge of many parts at one view.

The Astronomer Royal, at his first visit to a lighthouse with the Commission, simplified the method of internal observation, and improved it by introducing the use of a card. By marking a point which corresponds to the position of the image of an object outside, on the edge of a card placed at the focal distance of a lens, the observer's eye may be moved, so as to view the object through every point in the lens in succession, and if the lens be well made, and the card really coincident with the image, the mark and the object will always seem to coincide, in whatever direction the object is viewed.

Professor Faraday improved on this, and had an instrument constructed on the same principle; a metal edge sliding on a vertical and horizontal scale, and Mr. Chance has used the instrument, and he has now adopted the principle of internal observation, in testing and setting apparatus at his works.

That principle is equally applicable to all parts of the apparatus, and it was used for examining reflectors, lenses, refracting bands, and totally reflecting prisms, at home and abroad. The instrument applies the principle, and makes it more useful.

It appears that Fresnel caused movable mirrors to be set by looking from the burner at the horizon, reflected in the mirror.

The keeper at Grinstead set his mirrors (as he stated) by looking *over the edge* of the burner, making his assistant move the mirrors till the horizon was seen in the centre of each, and they were found to be so set that the horizon was seen as described.

Mr. Stevenson states that he has so set mirrors in Scotland, and the horizon was seen in mirrors at Skerry Vore.

The keeper at the Start set his mirrors, according to instructions, by looking past a metal edge placed across the centre of the burner, at the centre of each mirror in turn, and at the reflected image of a spirit level fixed on a pole outside the mirror, and within the lantern, by which arrangement nearly the whole of the light reflected by the mirrors was sent to the clouds.

The upper prisms of lenticular apparatus according to a book published by L. Sautter and Co. in 1858, page xxxv, should be set by looking from the *outside* along a spirit level at the centre of each prism in turn, and at the reflected image of a red ball suspended in the centre of the apparatus, and reflected by the prism; which ensures that all the light *above* the place of the ball, that is more than half the light reflected by the prisms, shall be thrown above the geometrical horizon and far above the visible horizon, and so lost.

The lower prisms were to be set by the same method, the ball being slightly raised for each, which ensures that nearly all the light reflected shall be sent to the geometrical horizon, and *above* the true horizon, and so lost.

Mr. Holmes states that he examined the prisms at South Foreland by this method; that he found them to be badly set, and that they were subsequently adjusted by this method according to the usual rule.

The method of testing apparatus pursued at the works of Mr. Chance, as explained to the Commission on the 23rd of December 1859, was to place a white ball or a minute gas flame in an assumed conjugate focus of a lens or prism, and the eye of an observer in the other conjugate focus at a short distance *outside*.

The whole apparatus was tested in like manner, and the difference between the conjugate focus for the distance and the focus for parallel rays was calculated.

And when dioptric apparatus in lighthouses in England and Ireland was tested by the method of internal observation, it was found in every instance that the lamp and the apparatus were so placed and set with reference to each

other, and to the image of the landscape formed by the lens and prisms, that a part of the light produced was wasted.

The transparent landscape and drawing of flames at the beginning of the Report, are intended to show the practical results.

The method now pursued at Birmingham is to place a minute gas flame at the greatest distance attainable in the shed, and to observe the direction of the axis of the refracted pencil from *within*, by the help of Professor Faraday's instrument, and the improvement effected by the change is illustrated by Professor Faraday's report on the apparatus lately made for the Smalls.

The source of light is moved so as to be on a level with the centre of the prism, lens, or zone, under observation, and it is placed at a small distance.

If the operation could be conducted from a height, say of 100 feet, and if the object observed were at a greater distance, say a chimney, three or four miles off, or if the rays of the small lamp were made parallel by using a small lens, it would be an improvement, because a nearer approach to reality.

Experiments were also conducted at the same works to discover the brightest part of a flame, by allowing the light refracted through the bit of glass under observation, to fall on a screen distant 30 yards. It appeared to me that the result obtained could not be relied upon, because the rays from the more distant parts of the flame, appeared on the screen as condensed light, (because the screen was in the conjugate focus for that part of the flame,) while the more important rays, those from the neighbourhood of the chief focus near the centre of the flame, being refracted nearly as parallel rays, appeared on the screen as diffused light.

Photographs taken of the flame at the same time show that the brightest part of the outside shell of the flame under examination which coincided with the conjugate focus for the screen was lower than the brightest part of the central flame.

Similar experiments were tried by the Messrs. Stevenson, near Edinburgh, before and after the experiments tried at Birmingham, and the result arrived at was quite different from the result obtained at Birmingham. The place of observation was at a much greater distance, and the instrument used to test the light was a photometer.

The readiest method of discovering the brightest part of a flame appears to be either simple inspection of the flame, or the plan which I suggested and have pursued. It was adopted by Mons. Sautter and by Mr. Stevenson, and consists simply in taking a photograph of the flame. By over printing the negative, the brightest part of the flame appears in the positive; by exposing the plate for a longer or shorter time, as was done by Mons. Sautter, the plate is more or less affected, and only the brightest part appears in the negative least exposed.

Photographs of flames have been lithographed, and appear in the Report, at the beginning. Photographs of flames.

The brightest part of the flame being ascertained by some method, and the best position of the burner decided upon; the apparatus can easily be tested by looking through it, at a sea horizon, or at any distant object, in the same direction; and when the apparatus is properly set the burner can be adjusted and the flame regulated at will.

Fig. 3 is copied from a photograph taken at Whitby. The flame, the burner, the observer, who was looking at the South Lighthouse, through the upper refracting zone, and the indistinct image of sea and sky, formed by the refracting hand and zones in the flame, were all taken at once, and are represented within the circle described about the focal point. The distant landscape was afterwards taken more accurately in the usual way, from the gallery outside. The photographs were all taken with the same lens, and bear the same proportion to each other, and the drawing may give some idea of what the observer represented, actually saw, when he looked at a sheet of ground glass placed upright on the burner to represent the focussing screen of a camera.

The inverted landscape must be assumed to be transparent, and rolled round the perpendicular axis of the lens till the sea horizon is brought to the left of the lighthouse tower, and behind the observer. The four drawings, Figs. 1, 2, 3, 4, together, and this description may serve to explain what is meant by the "method of internal observation" referred to by Mr. Chance in his paper, by the Commission in their Report, and alluded to in the letter of the Astronomer Royal, dated 16th June.

Previous to the 2nd of August 1860 the following experiments had been contrived and were prepared to illustrate what has been said above. A small lighthouse lens, lent by Mr. Chance to the Commission, was set upright on a table in a window; a table gas lamp was placed behind it—a bit of ground glass, of the same size as a section of the gas flame,

was placed on the burner, and the whole was arranged so that the image of a particular door way in the street coincided with the place of the point of the full-sized flame which was highest and nearest to the lens. The office keeper was then instructed to light the gas, and to raise and lower the flame, by turning the gas on and off. On going to the doorway the points of the flame were seen to appear at the top of the lens, and the light to descend as the lamp flame was raised, till the whole lens was filled with light, and on lowering the flame, the light rose and disappeared at the top of the lens, which showed that the observer was beyond the conjugate focus for the most distant part of the flame, and that no part of the flame was nearer to the lens than its chief focus.

On walking towards the light or from it the same effect was produced, and the image of a man walking along the pavement appeared on the ground glass inside, inverted and moving up or down as he receded from the house or approached it.

2. A bit of a lighthouse prism was placed on a table, so that the sun's rays might fall upon it. The focal distance was estimated by observing the sun's image, and the effect of raising the prism, or of moving it, was estimated by observing the effect caused by the apparent motion of the sun, and by moving the prism.

Some of the experiments subsequently tried at Whitby, and at Mine Head, and elsewhere, were similar experiments on a larger scale.

It is perhaps worth explaining the structure of a lighthouse beam, for the common notion of it is erroneous.

The beam is not simply a beam of light composed of parallel rays, with a like section at any distance; but is in fact a very complicated structure.

Each of the numerous bits of glass or metal of which lighthouse apparatus is composed, treats a different portion of each of the countless spheres of light, where centres are the radiant points of which the lamp flame consists.

Diverging rays which would form cones or pyramids, or wedges of light, if they were allowed to escape freely through round or square holes, or through slits in a shutter, are modified by the glasses, which in catadioptric apparatus are of forms that would cover holes and slits of various shapes and sizes, and which do take in the bases of diverging solid figures,—carved as it were out of solid spheres of light—whose centres are points in a lamp flame.

According to the distance of each radiant point from the glass, its rays are differently affected by it, and the whole beam is made up of diverging and converging rays.

Rays which diverge from points nearer to the glasses than their chief foci, diverge less after they have passed through the glass, but they continue to diverge, and never meet again to form an image.

Rays which diverge from points further from the glasses than their chief foci, converge after they have passed through, and do meet again at points situated at various distances. These last rays when they meet produce (either in the air or on a screen), magnified inverted images of the parts of the lighthouse flame, which are beyond the chief focus, and when they have met they cross and diverge once more.

The divergence in all cases depends upon the form of the glass, and the distance of each radiant point from it.

Only those rays which start from certain points can emerge as parallel rays. These points are differently situated with reference to every separate part of the complicated structure which nearly surrounds the compound source of light, and the points which would produce parallel beams are not always radiant points. What is true of a beam of refracted light is true also in many respects of light which is reflected; and it may be said, than an observer at a great distance, who looks at the light of a lighthouse, is looking through a great number of inverted magnified images of parts of one-half of the flame, at the other half of the flame magnified, but not inverted. His eyes take in some points and some sections of the large and small ends of some cones, pyramids, and wedges, as well as sections of parallel beams of light. They may be filled with concentrated light from one point, and diffused light from another, with diverging, parallel, and converging rays, inverted and erect; and the problem which a lighthouse engineer has to solve, is how to arrange the glass lenses and prisms or metal reflectors, with reference to the source of light which he has at his command, so as to get the greatest possible number of the points and small ends of these numerous cones and pyramids and wedges of light, together with the largest possible sections of the broad and narrow ends of the greatest possible number of these figures, in short the greatest possible quantity of the light produced, into the eyes of those observers whose wants ought to be most considered, without neglecting those observers whose wants are of less importance.

All the calculations of the contriver of such optical apparatus must be founded on the shape, and size, and position, and nature of the light to be used, and on the requirements of the locality in which the lighthouse is to be placed. A perfect optical contrivance for one kind of light, or for one place, may be a very bad one for a different source of light, or a different place; and to make such calculations, and contrive apparatus to suit every light, and every locality, where lights are and where they ought to be, would find employment for many wise heads for many years to come.

Fig. 5. is intended to show that even when the apparatus is well made, and the lamp properly adjusted, the glass chimney of the lamp may by its form seriously injure the efficiency of the light, by causing refraction in a wrong direction at the outset.

The dark line shown in the photograph nearly coincides with the position of the image of the horizon in many lighthouses, and is quite as distinctly marked as it was in the table lamp from which the photograph was made, and which first called my attention to the defect.

The rounded shoulder of the chimnies used in France does not produce this effect. The reflected light in Fig. 5. was from a plane mirror placed upright behind the light, and shows that a mirror placed as the mirrors were placed at South Foreland, near the electric light, will produce the effect of a larger light, or of two distinct lights, and so produce divergence.

The effect produced by plane mirrors is further illustrated by Fig. VI.

VII.—I have suggested as a fit subject for experiment the manufacture of reflecting prisms in such a form that rays of light should fall on the first and last surfaces nearly at right angles, instead of falling on these surfaces, so that a part is refracted and a large part reflected, and so lost.

The figures might be something of this shape—

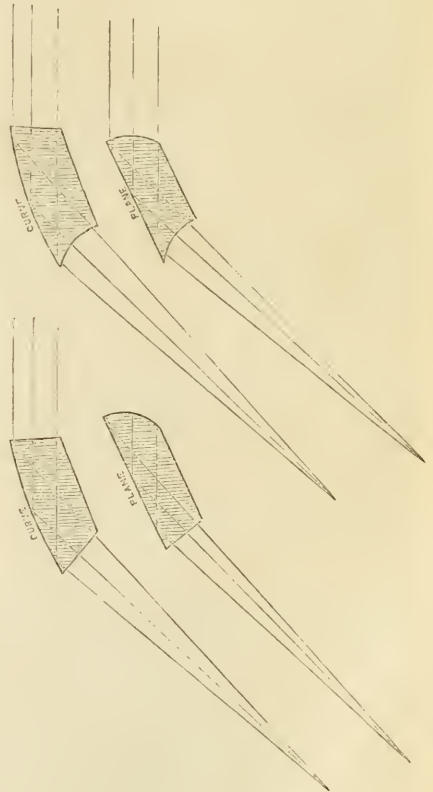


Fig V From a Photograph

1. Show the true effect of seeing a glass buoy with one mirror shoulder
2. See the effect on a white horn behind the hole

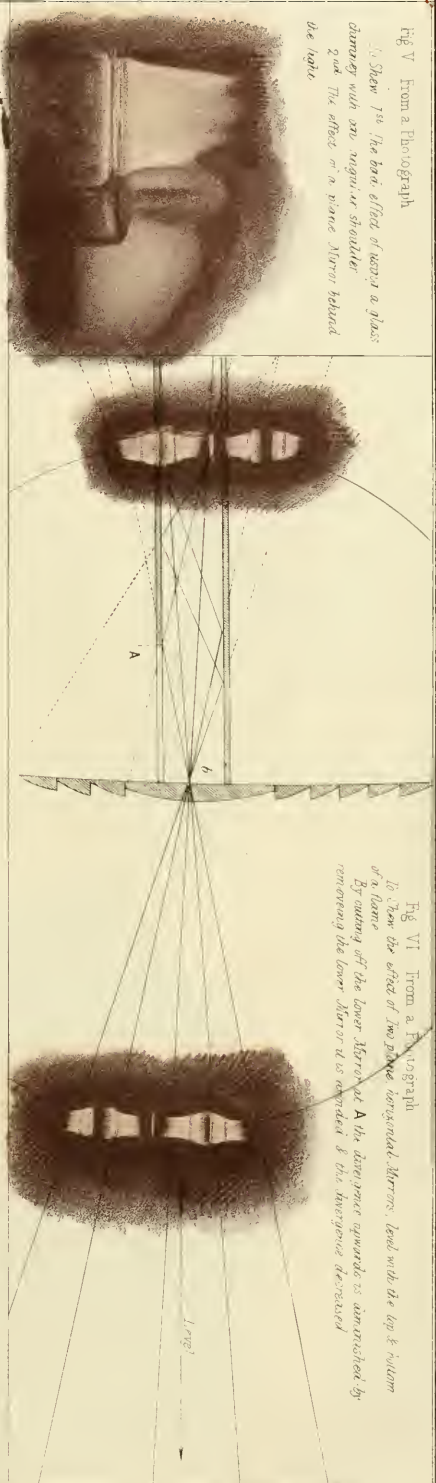


Fig VI From a Photograph
1. Show the effect of two white horizontal mirrors, laid with the top & bottom of a flame
By cutting off the lower mirror at A the distance upwards is diminished by increasing the lower mirror it is increased & the horizontal decreased



any shape GREEN wrecks or sunk rocks

CODE OF SIGNALS.

- A Buoy means Danger
- Curve, Northernly
- Angle, Southernly
- Black, Easterly
- Red, Westerly

thus

- Buoy Curve, Black & Red
- Danger N between E & W
- Buoy Curve, Black
- Danger N. E.
- Buoy Black, Curve, Angle
- Danger E between N & S.

the height of the Arch as open, one half shut

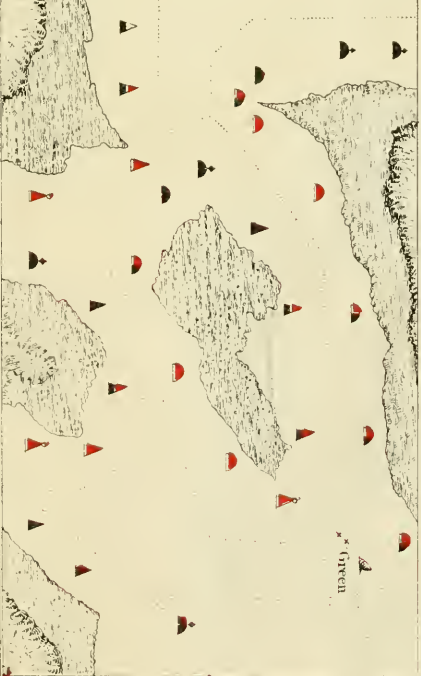


Fig VII System for indicating the Compass bearing of dangers, by the Form & Colour of Buoys & Beacons.

Copyrighted material

There to go at the
beginning of the paper
by the Seez. —

Fig. 4. is to be copied from the
Photographs. left with it, as indicated
by the tracing in outline on this paper.

Be careful with the outlines
~~never mind the~~ do not copy the ^{ink} lines
on the drawing except as shown in the
tracing.

The whole can probably be seen on one
plate. — —

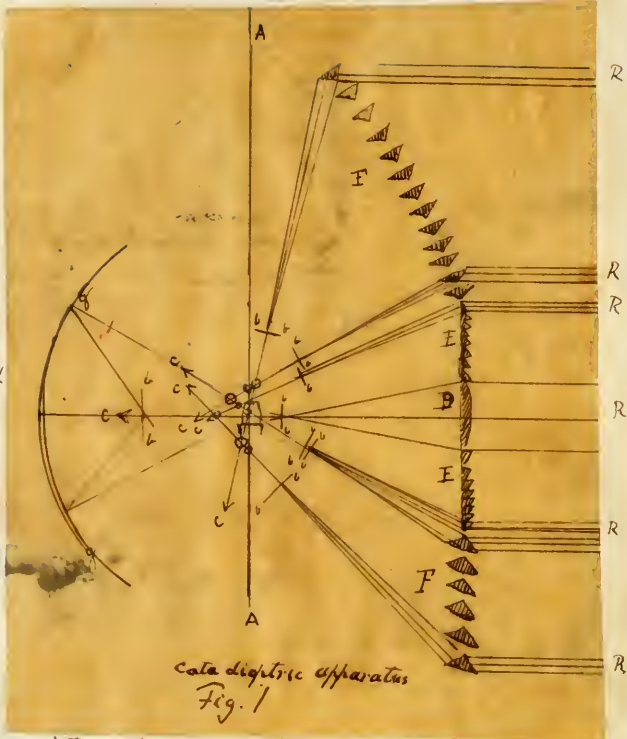


Take the
details of the lamp
& frame from
this, and place
the sun's image
on the horizon

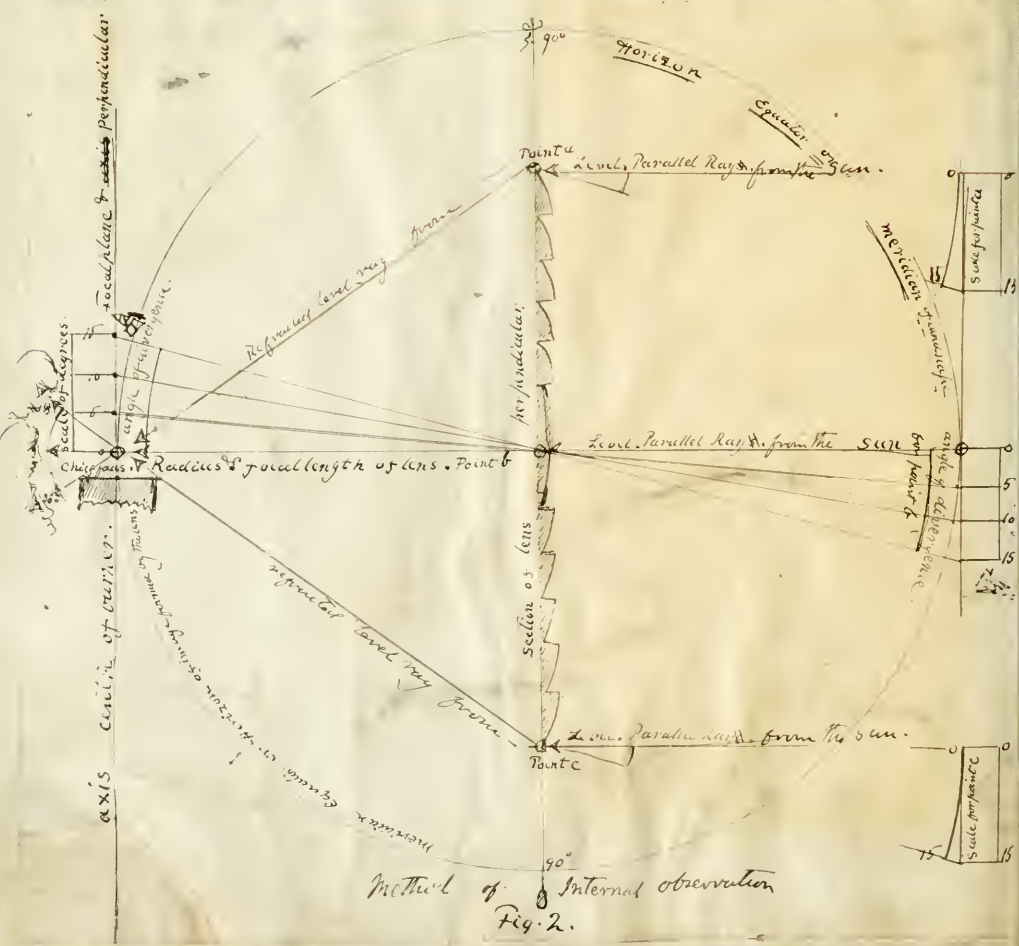
See book for other Prints of
the same photographs. —

- AA axis
- bb Foci
- CC axes of pencils
- DD Diaphic lens or refracting belt
- EE Refracting Zones
- FF upper & lower catadioptric prisms
- OO points of intersection
- GG catoptric spherical mirror reflector

RR Parallel Horizontal Rays. for example the Sun's rays near sunset.



In this case there are 36 glasses differently figured, all separately made and set. each has its own focus. & all the foci can must be brought into the light of the lens, & the axis of each piece must cut in flame in the right direction. They are all perfectly adjusted in the above



Creek up 150

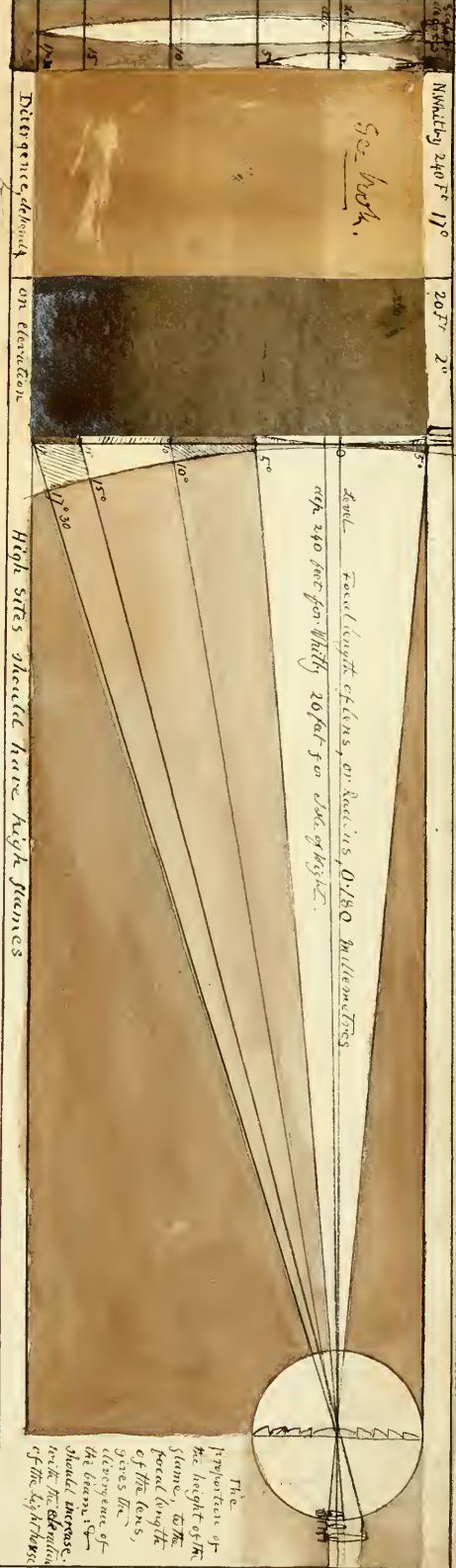
Scale of 22° 30' degrees. 3/4 1/0



Place the horizontal axis to the line

Never repeat this lamp.
Q. S. 175

Fig. 3. Method of internal observation



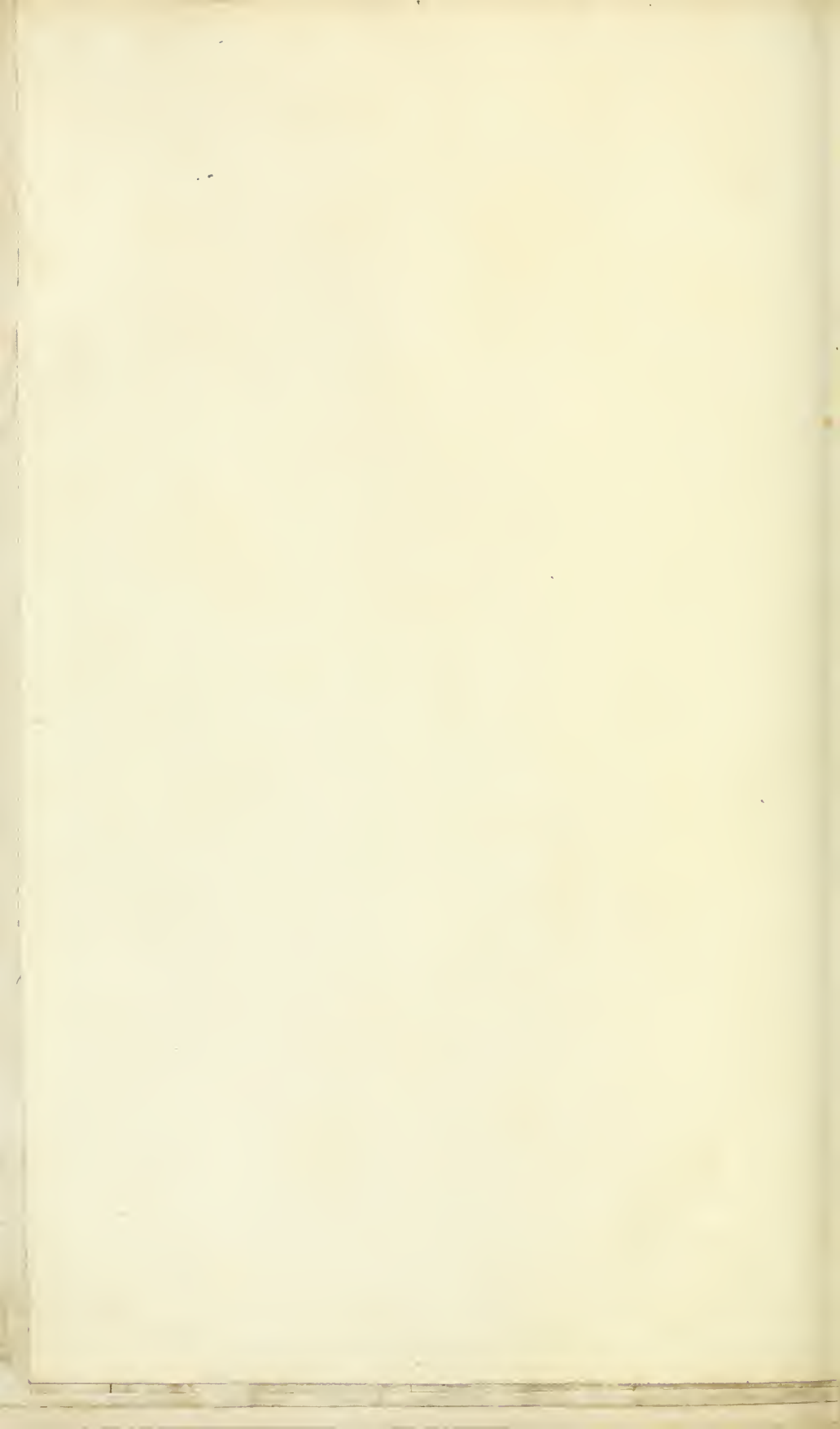
Focal length of lens, or Section, 0.180 Millimeters

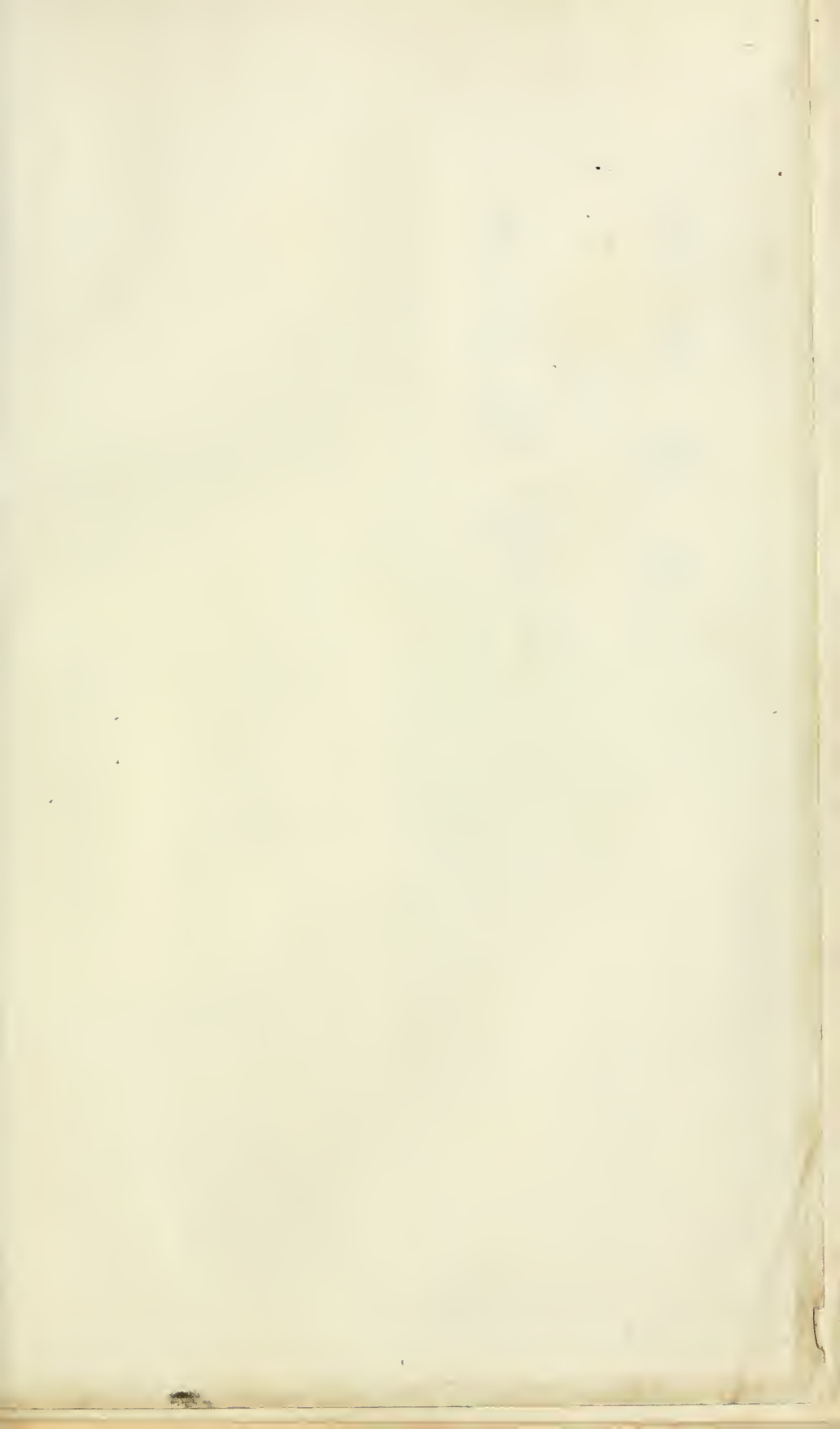
240 feet for width 20 feet for dia. of light.

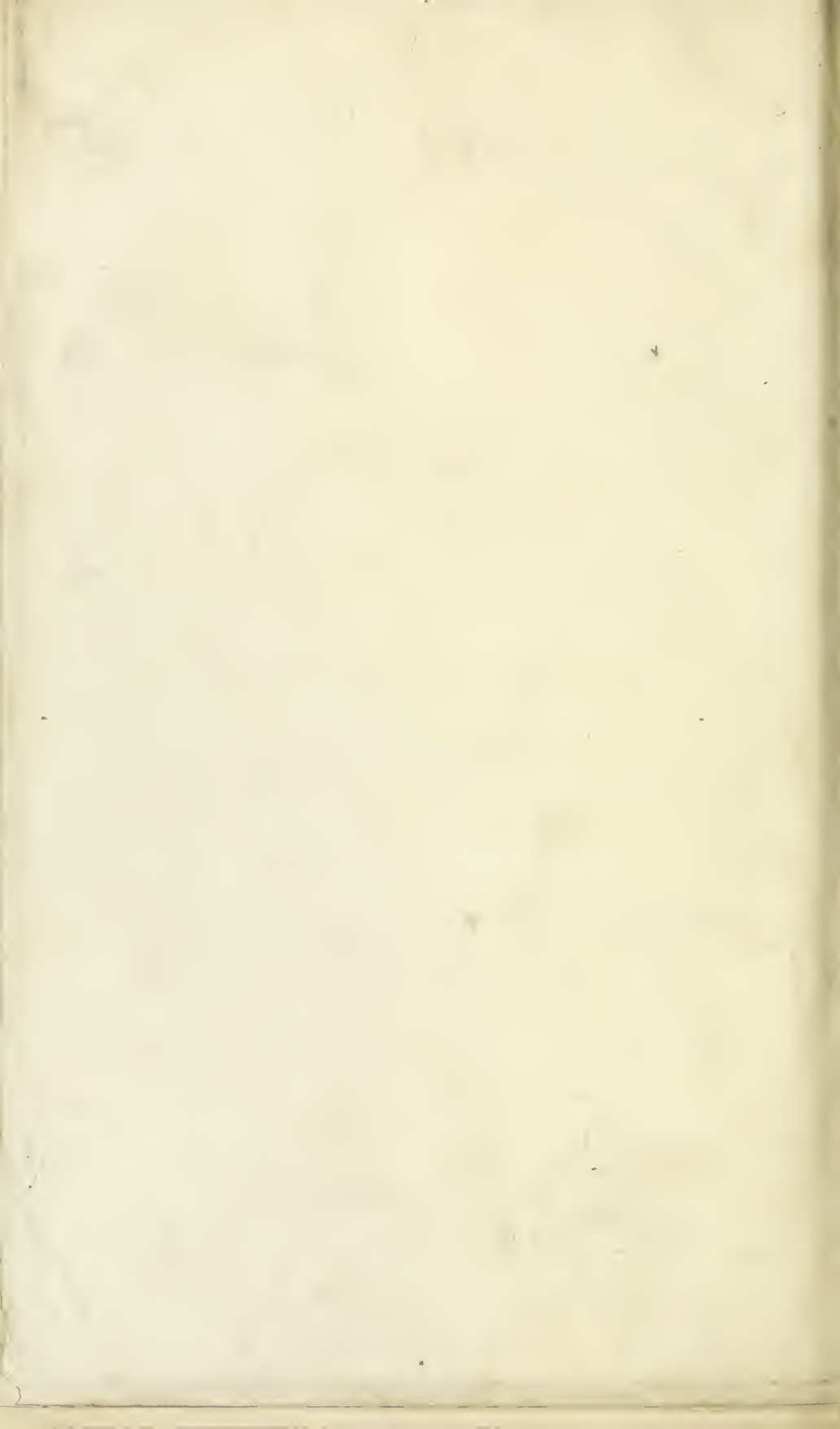
High sites should have high staves

The proportion of the height of the same, to the focal length of the lens, gives the divergence of the beam, which should increase with the diameter of the light.

Fig. 4. Divergence of Beam







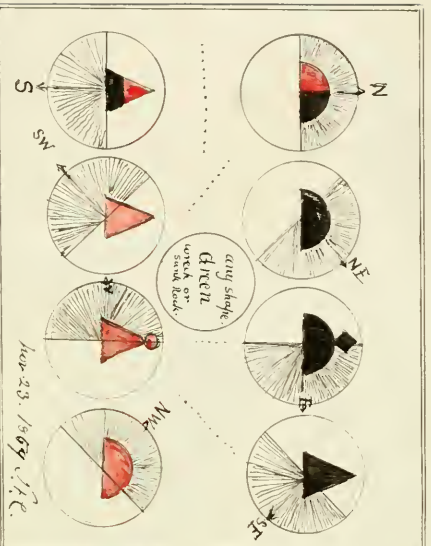
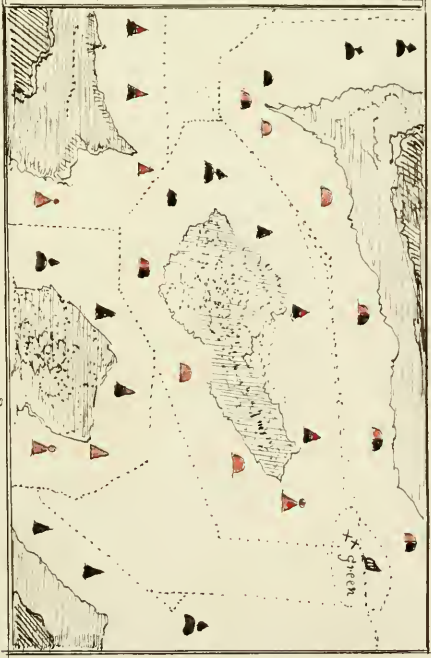


Fig. VII. Systems for indicating the bearing of dangers by the Form & Colors of Beacons.

Circle of Signals.
 A Buoy means danger.
 Curved - Northernly
 Angle Southernly
 Black Easternly
 Red Westernly

Flags.
 Buoy Curve Black, Red
 Curved N Southern, E
 Buoy Curve Black
 Curved N
 Buoy Black Curve Angle
 Curved E Southern, N S
 one half of the circle
 is open, one half shaded.



Put them on the same stone as the
 warning buoy gateway & W.P. Number 2. 61

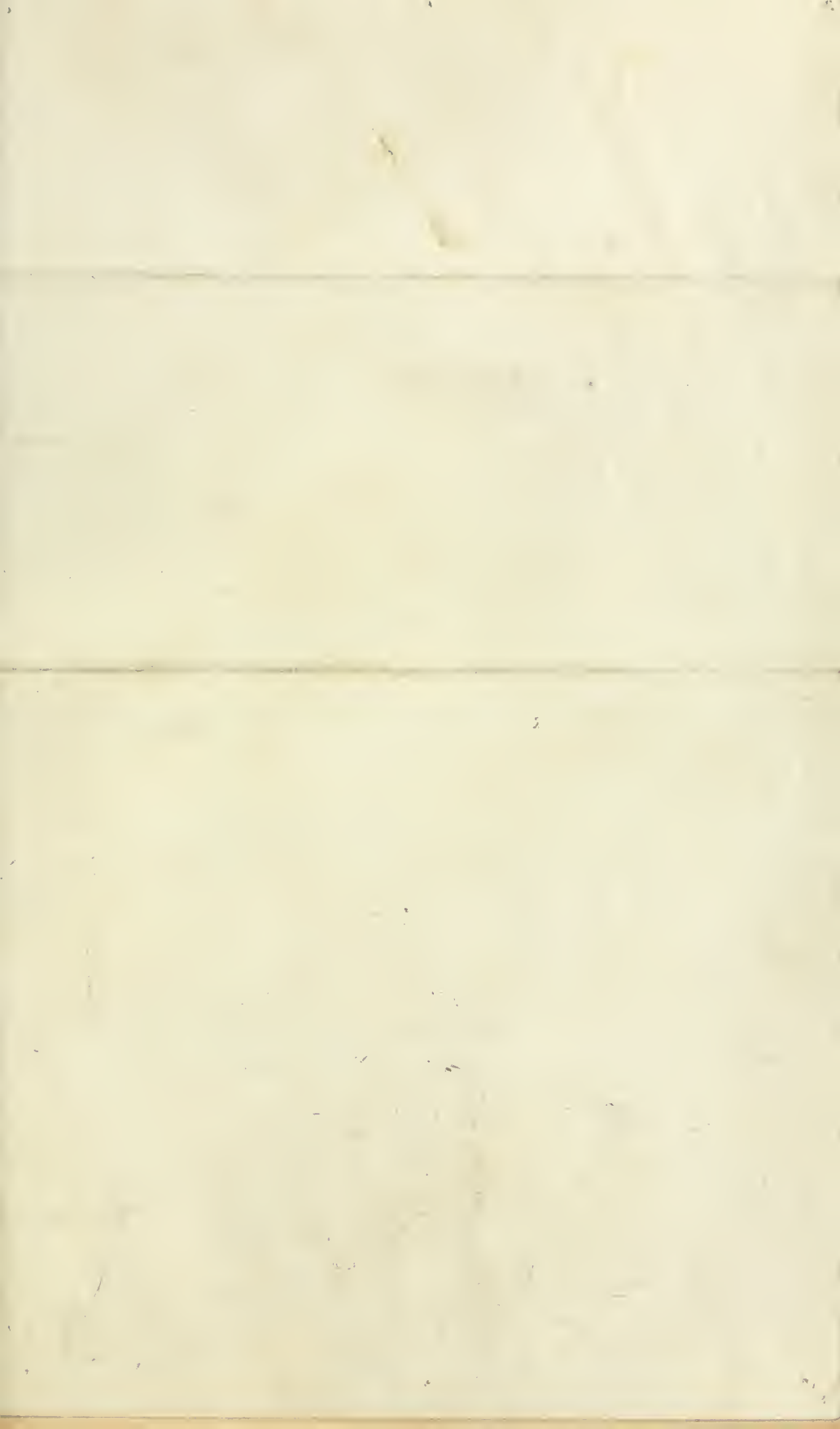


Fig. V To show effect of change in angle of incidence on the effect of the mirror.

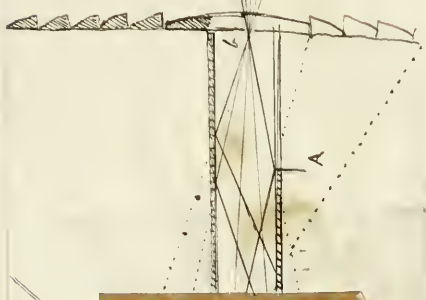
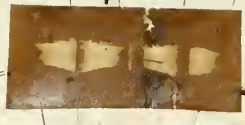


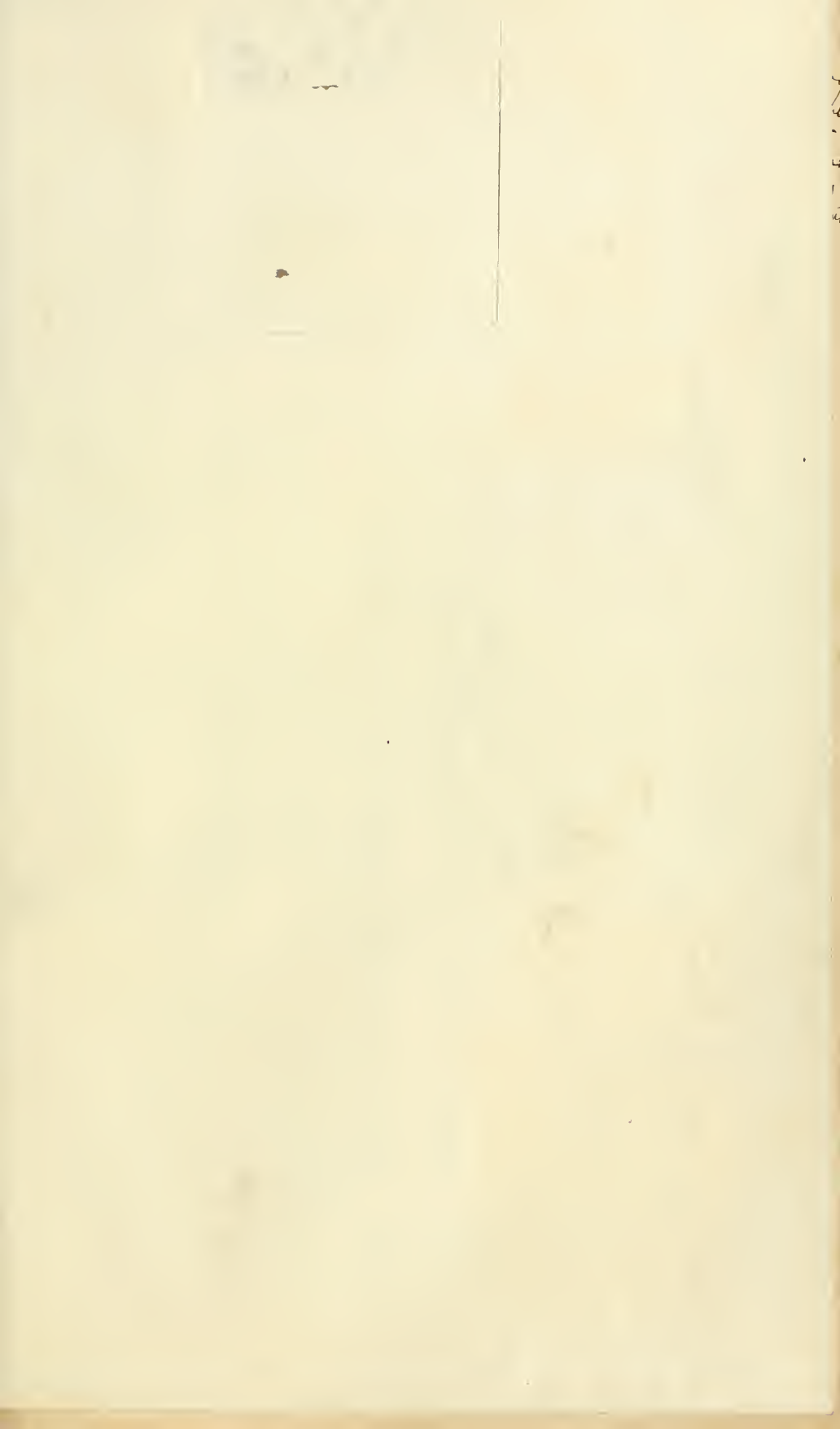
Fig. VI from a photograph. To show the effect of two plane, horizontal, mirrors, level with the top & bottom of a flame.
By cutting off the lower mirror at A the divergence of rays is diminished: by removing the lower mirror it is increased. & the divergence decreased.



level

Fig. VII

To fill this space.
A drawing will be sent tomorrow if possible.



111-52

City of New York Aug 17 / 1866 to Robert West Brewster,
New York Provisional Secretary, ^{Washington} D. C. should to the
meeting on the 20th of August.

W. H. C. Aug 17 / 66

Persons of our party to
make out ^{at home} advice. Photographic arrangements,
taken from the camp early. The photographs of the Observatory
is particularly well succeeded in these.



ny
h
-
is
1
at



Penelagani
May 20 1967
see the address of the President of the British Association at the meeting on the tide.
Force of the application of the downward pull is an account of a tidal mill at Down.
This will prove how very slow people are to take up an obvious improvement.

XII. and XIII. I would suggest that the water power due to the rise and fall of the tide and the force of currents, should be used at lighthouse stations, and elsewhere; for example, a well, connected with the sea, and a float, would wind up machinery. Such a contrivance might be made to ring a bell on a beacon, or blow a whistle. In the same way the movements of the waves might be made to act upon hollow chambers, so as to compress the air, and produce loud sounds. It only requires a little ingenuity to turn such an enormous natural power to use, and it seems superfluous to do more than allude to it.

XIV., XV. A floating lightvessel or a buoy being a structure fastened to the bottom and floating near the surface of a stream, it appears that the principle of a boy's kite might be studied with advantage. To fasten the mooring chain in the centre of a flat or hollow surface, appears to me to give the greatest possible strain, and to tend to produce a spinning motion, without any corresponding advantage.

To fasten the chain high up forward appears calculated to drag a lightvessel down into the sea, and increase the strain.

It seems to me that if the moorings are fastened somewhere about the forefoot of a vessel, they will occupy the same position as to the strain which the knot of the string of a kite occupies with relation to the direction of the wind, and so tend to make the vessel rise upon the current, or over the advancing waves.

To fasten the moorings of a flat-bottomed buoy to a bridle, would be to imitate a child's round kite, and, as I imagine, it would both diminish the strain and make the structure float more steadily. I have made no experiments, but I think experiments should be made, and the form which a well-made kite assumes when floating steadily in a strong wind, might perhaps suggest a good form for the under surfaces of buoys and floating lightvessels, and might be taken as a starting point in the study of this branch of flotation.

XVII. The following system of buoyage, Fig. VII., is applicable to buoys now in existence, with some few alterations in their colour and shape. It was first submitted to the Commission on the 21st November 1859, and since that period several systems have been suggested, which start from the same principle; namely, that a buoy shall indicate by its shape and colour the compass direction as well as the existence of a danger.

I proposed that black and red shall be the only colours used, and that forms be divided into *curves* and *angles*. That these four symbols be combined, so as to form a code of signals to express eight points of the compass; and so indicate the direction in which it is unsafe to steer, and the safe course.

XVIII. The same sound that will best penetrate clear air.

XX. I have made no experiments, but it seems worth a trial to construct a building with funnels arranged on the same principle as the mirrors which are placed above the lenses in some lighthouses, and to place the source of sound in a like position with reference to the reflecting surfaces, as the source of light is placed.

Hitherto experiments to direct sound have been made in imitation of the catoptric system. This would resemble the dioptric, and might be as great an improvement. It is not easy to contrive a cheap and serviceable method of producing loud sounds for fog signals; but very loud sounds are now produced by the action of the sea on condensed air, in sea caves at several lighthouse stations, and by a little ingenuity the natural power might be so applied as to be made useful to passing ships. There is generally sufficient motion in the waves to create a considerable power, and in dead calms the old bell might be used.

XXI. The lower the better to be heard on the water, speaking from experience of voices and other sounds heard in boats at sea.

XXII. The answer to this depends in a great degree on local circumstances. If it is desirable to ascertain the comparative clearness of the atmosphere at several stations, an instrument contrived some years ago, and which has been well tried, might give information. It consists of a ball of glass, with the centre coincident with the centre of a hollow hemisphere, made of wood or other materials. The surface of the latter is everywhere coincident with the burning focus of the glass ball. Whenever the sun shines it burns a mark; when the sun is obscured a blank is left; and as the image of the sun changes its place during six months, minute by minute, and day by day, the surfaces of the bowls give an indication of the amount of sunshine which has penetrated the atmosphere during six months. Bowls exposed in London and near London, out of the smoke, show a marked difference; and they would do the same if there were a difference of the same amount in the atmosphere of neighbouring sites proposed for lighthouses; for example, an experiment tried for a year might have proved that which is now known, that the Needles Rocks, though lower, have a much clearer atmosphere than the bluff above them, a couple of hundred yards distant, where clouds often form and hang, while the sun shines elsewhere, and where such clouds formed at night and obscured the lighthouse.

XXV. In order to identify a lighthouse by day, it is, in the first place, necessary to see it. A series of experiments were tried on the Needles Rock lighthouse which is a greyish white, and was seen alongside of a chalk cliff, and against the sea as a back ground.

From these experiments, and from my own experience of shooting birds, and from the testimony of witnesses who have expressed an opinion as to the colours which are best seen on the water, and from a simple consideration of the matter, I am convinced that white or grey is the very worst colour that can be used for lighthouses which are seen against the sea or sky, or against light back grounds. They should be coloured black or red. It would be equally wrong to place a red lighthouse against a red cliff, or a black lighthouse against a dark rock, and the background should always be considered in fixing on the colour.

It would be easy and inexpensive to paint lighthouses and floating lights in stripes, so that each might vary in appearance from those nearest to it.

CIRCULAR X.

I. The answer to this question depends upon the relative amount of knowledge possessed by the authority which gives the order and the manufacturer. In any case the apparatus should be designed and made for the locality.

II. The same answer applies, and all that has been said above is intended to demonstrate the necessity of considering the use of the instrument before it is made. "A first order catadioptric apparatus" is not something definite like a round cake of which a slice of so-many degrees can be ordered from a maker without further direction or information from the purchaser. It is a complicated instrument, which should be designed for the use to which it is to be put, either by the purchaser who gives the order or by the maker, whichever is best able to make the design.

III. Tables may be constructed from proper data, but it would be better to work from an order than from tables. The small lights contrived by Mr. Stevenson for narrow sounds in Scotland, and the dioptric system of Fresnel did not result from tables, or from following a beaten track, but from an inventive genius, professionally directed to a certain subject, and aided by knowledge and experience practically applied.

IV. The forms of tender issued by the three General Authorities have been obtained, and they give the best answer to this question.

Mersey Docks and Harbour Board.

Marine Surveyor's Office,

Liverpool, 31st January, 1861.

DEAR SIR,

HEREWITH I send a letter accompanied by a sketch which I trust will meet your wish, and will I hope assist to a just estimation of the capabilities of an invention, which in its way, I believe, to be eminently useful, and as yet unsurpassed. I send also the larger drawing in case it may throw any light on the subject, and will thank you to have it returned; as the arrangement for disconnecting is a specialty connected with the transmission of the buoy to its destination, I have not shown that portion of the arrangement in the sketch.

S. R. Graves, Esq.,
&c. &c.

I am, &c.,
GRAHAM H. HILLS.

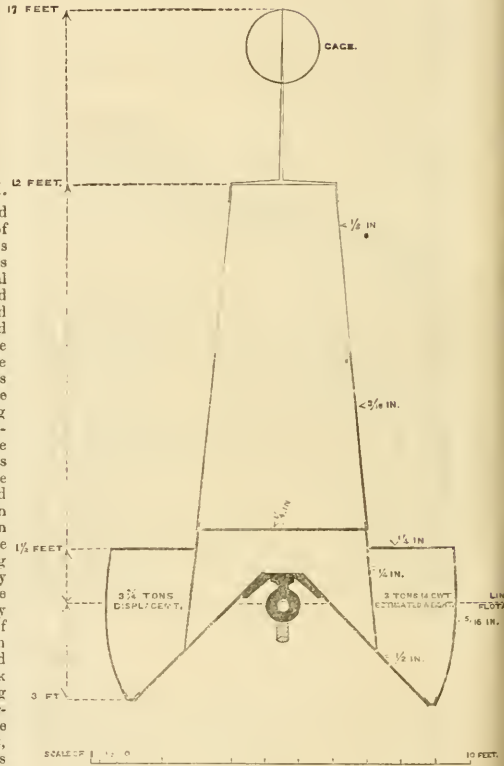
SIR,

Marine Surveyor's Office,
Liverpool, 31st January 1861.

REFERRING to a recent conversation on the alleged defect of "Hard Riding," attributed to certain buoys of Herbert's Patent, built in Liverpool for the Mersey Docks Board, you are aware that such remedy as the circumstances of the case permitted has been applied, by giving additional strength to the mooring arms; it should be remembered that those buoys were the first attempted to be constructed so as to act independently of ballast, the weight required for ballast being procured by extra thickness given to the plates forming the bases of the buoys. I ventured to state to you my opinion, that the oscillatory motion of these buoys (by which in heavy weather the hollow cone is raised to the surface, and becomes subject to the action of running seas, giving rise to the "Head Riding"), was attributable in a principal degree to the faulty distribution of the ballast, inasmuch as the increased thickness of plates was given as well to those forming the periphery as to those nearer the centre. In compliance with your request, and in illustration of the idea, I enclose a sketch of a section of a buoy furnished to the order of the Liverpool African Association, intended to be stationed as fairway buoy to the entrance of the Bonny River; in this case, instead of anything like equal distribution of weights, the periphery of the buoy is plated simply with regard to necessary strength, and the extra weight required for ballast is approximated as nearly as possible to the axis of motion and centre of gravity of the body. This extra weight is comprised chiefly, 1st, in the apex of the cone, which is formed of a solidly forged cap with mooring eye in the centre, the cap 2½ inches thick in the centre, tapering to ¾ inches at the rims, and weighing with the shackle slightly over 5 cwt. 2ndly, the super-structure, instead of resting on the deck is based on the cone, an arrangement which brings additional weight, amounting in this case to 6 cwt. in proximity to the centres of the buoy; and is designed at the same time to give greater stability to the structure, one instance having occurred where the old form of pillar worked loose from the deck; the cone bearing the strain of the moorings require extra strength, and the weight so necessitated is not unfavourably situated in reference to ballasting. In the sketch the situation of the weights is made apparent by the proportionate thickness of the lines describing the several parts.

I have, &c.
GRAHAM H. HILLS,
Master, R. N., Assistant Marine

To the Mayor of Liverpool, Surveyor, Liverpool.
S. R. Graves, Esq.,
&c. &c.



COLONIAL LIGHTS.

SIR, Royal Commission on Lighthouses,
28th January 1859.

I AM directed by the Lighthouse Commission to request that they may be furnished with the following information:—

1st. A Return showing the names, positions, and description of lights, on shore and afloat, in Her Majesty's Colonial possessions, under the superintendence of Her Majesty's Government; showing also what lighthouses are under construction, or intended to be constructed, and at whose expense, both of construction and maintenance, the cost of maintenance of each light, the amount of dues on shipping received (if any), and the mode of levying these dues.

2d. The Commissioners would further wish to be informed to whom the immediate supervision of the construction of Colonial Lighthouses is entrusted.

I have the honour to be, Sir,
Your obedient servant,
T. H. FARRER, Esq.,
Assistant Secretary,
Marine Department,
Board of Trade.

J. F. CAMPBELL,
Secretary.

(No. 66.)

Office of Committee of Privy Council for Trade,
Marine Department,
Whitehall, 9th February 1859.

SIR, I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 28th ultimo, requesting certain information as regards the Lighthouse authorities in the United Kingdom and Her Majesty's Colonial possessions.

In reply, I am to inform you that the general Lighthouse Boards in the United Kingdom who are in connection with this Board are,—

The Trinity House of Deptford Strond.
The Commissioners of Northern Lighthouses, &c.
The Port of Dublin Corporation.

The lights under the jurisdiction of these three Boards are shown, as marked in red ink, in the printed list of lights herewith enclosed.

As regards the harbour and other lights not marked in the enclosed list, there is no information in this office to enable my Lords to state by what local authorities they are managed.

Colonial lights are generally under the jurisdiction of the respective Colonies, though in some few instances they are erected and maintained by imperial funds.

Those which have been so erected and are now so maintained, wholly or in part, are as follows:—

Bahamas:
Gun Cay,
Cay Sal,
Abaco,
Great Isaacs, building,
Cay Lobos, ditto.

Cape of Good Hope:
Roman Rocks, building,
South Point, ditto.

Ceylon:
Great Basses, building.

Newfoundland: Cape Race.

Ionian Islands: Cerigo.

Falkland Islands: Cape Pembroke.

Western Australia: King George's Sound, two lighthouses.

In compliance with a letter from this department, of 28th July 1856, to the Colonial office (a copy of which is enclosed), my Lords have obtained particulars of the management, &c. of the lights in the various colonies, and if the Commissioners desire it, the original documents can be lent to them for their information, as they are too voluminous to be copied.

I am, Sir,
Your obedient servant,
T. H. FARRER.

The Secretary to the Royal Commission on
Lights and Beacons, 7, Millbank Street.

Office of Committee of Privy Council for Trade
Whitehall, 28th July 1856.

SIR, I AM directed by the Lords of the Committee of Privy Council for Trade to request that you will call the attention of Mr. Secretary Labouchere to the communication from the Lords Commissioners of the Admiralty of the 10th February 1849, enclosing copies of some printed queries which had been prepared, in order that accurate information might be obtained as to the state and management of existing Lighthouses in the Colonies at that time.

These questions were forwarded by the Admiralty, with a request that directions might be given to the Governors of Colonies to transmit a copy of them to the Superintendent of each of the Lighthouses, situated within the limits of the Colony.

The information thus obtained was down to the 1st April 1849, and was printed in Parliamentary paper No. 650, of the 1st August 1850.

Since the control of Colonial Lighthouses has been vested in this Board my lords consider it most desirable that they should be informed of any Lighthouses which have been erected since the above-mentioned period, with all the particulars relating to them, and to their management; and also of the alterations, if any, which may have been made in any of those included in the former Return.

I am therefore desired to transmit 400 copies of the original queries; and to request that you will move Mr. Labouchere to be so good as to forward them to the Colonies respectively, and to cause instructions to be given in order that this valuable information may be obtained from the Colonial authorities with as little delay as possible.

I have, &c.
(Signed) JAMES BOOTH.

Herman Merivale, Esq.
&c. &c. &c.
Colonial Office.

SIR, WITH reference to your letter of the 9th February, 14th May 1859, containing a list of the Colonial Lighthouses under the control of the Lords of the Committee of Privy Council for Trade, I am directed by the Lighthouse Commissioners to request that a Return may be furnished showing:—

1. Number, names, and positions of Colonial Lighthouses under the control of the Board of Trade now in course of erection.
2. Date when erection of each was commenced.
3. Original estimated time required for the erection of each.
4. Time still required for the completion of each.
5. Original estimated cost of erection, exclusive of lighting apparatus.
6. Sums already expended in the erection of each.
7. Sum still required to complete each.

Office of Committee of Privy Council for Trade,
Marine Department,
Whitehall, 5th July 1859.

SIR, I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 14th May last, requesting to be furnished with certain Returns relating to Colonial Lighthouses under the control of the Board of Trade, now in course of erection.

In reply, I am to transmit to you the enclosed Return giving the information requested in your letter.

I am,
Sir,
Your obedient Servant,
T. H. FARRER

The Secretary to the Royal Commission on
Lights, Buoys, and Beacons, 7, Millbank Street.

RETURNS OF LIGHTHOUSES IN THE COLONIES UNDER THE CONTROL OF THE BOARD OF TRADE, NOW IN COURSE OF ERECTION, MADE UP FROM THE ACCOUNTS RECEIVED TO 1st JUNE, 1859.

Name.	Position.	Date of Commencement of Work.		Original estimated Time for Erection.	Probable Time required for Completion.	Original Estimator of the Cost of the entire Work.	Amount already Expended.			Remarks.
		Contract.	Shipping to the Colony.				Commencement of Work in the Colony.	Lantern and Apparatus.	Tower and Other Works.	
Great Isaacs	On Great Isaacs, Bahamas.	Tower Nov 1854, Lanterns &c., August 1857	February 1857	August 1857	No Time given in Estimate.	£17,000	£1,800	£13,918	£15,814	The Contracts for this Lighthouse were entered into by the Admiralty, and the Work handed over to the Board of Trade in November 1856.
Lobos Cay	On Lobos Cay, Bah.	Various periods from March 1855 to March 1857	April 1858	April 1858	The present Year.	£15,900	£2,832	£11,297	£17,089	
Roman Rocks	Roman Rocks, Sixpenny Bay, Cape	Aug. 12, 1856	May 1857	August 1857	No Time given in Estimate.	£1,002	£1,026	£1,488	£5,511	
Cape Point	Cape Point, Cape of Good Hope.	Aug. 12, 1856	May 1857	January 1859	No Time given in Estimate.	£3,750	£1,896	£2,086	£4,082	
Great Basses	On Great Basses, Coast of Ceylon.	April 1856	From Sept. 1856 to April 1857	Nov. 1856 for Works at R.R. shore at R.R. side.	No Time given in Estimate.	£73,935	£1,001	£90,272	£119,294	The difficulties of working upon the Rock, and of hauling materials, have been found to be so much greater than was anticipated, that it is desirable to suspend the further progress of the Works, and to refer the matter to the Government for consideration. The Commission has accordingly appointed a Commission to visit the site and report on the question generally, no estimate can be made until the Commission has given either of the sums or of the time still required to complete the Works.

Office of Committee of Council for Trade, Marine Department.

Whitehall, 9th July 1859.

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 20th May last, requesting to be furnished with certain Returns relating to Colonial Lighthouses alluded to in the letter from this department of the 9th February last.

In reply, I am to forward the Returns in question, as per annexed list, and to request that when no longer required they may be returned to this office.

I also enclose Returns concerning two Lighthouses, one at Cape Race, Newfoundland, and the other at Cerigo, which are not included in the returns sent from the Colonies, but which have been completed under the directions of the Board of Trade since those Returns were called for.

I am,

Sir,

Your obedient servant,

T. H. FARRER.

The Secretary to the Royal Commission on Lights, Buoys, and Beacons, 7, Millbank Street.

May 20th 1859.

A letter was written by desire of the Commissioners, asking about the papers referred to in No. 66.

List of RETURNS relating to COLONIAL LIGHTHOUSES.

1856: No. 12,227	Leeward Islands.
" 12,599	Island of St. Vincent.
" 12,600	Galle, Colombo, and Trincomalee.
" 12,654	Gold Coast.
" 12,655	Island of Malta.
" 12,308	Sierra Leone.
* " 13,079	Bahamas.
" 13,108	Grenada.
1857: No. 190	Prince Edward Island.
" 847	Honduras.
" 1,105	Newfoundland.
" 1,652	Tobago.
" 2,934	St. Lucia.
" 3,002	Jamaica.
" 3,603	New Zealand.
* " 3,808	Falkland Islands.
" 3,863	Bermuda.
" 3,998	Plumb Point, Jamaica.
" 5,097	Australian Coast.
" 5,234	Turks Islands.
" 5,632	Natal.
" 9,111	Nova Scotia.
" 9,209	Victoria.
" 9,536	Australian Coast.
1858: No. 905	Tasmania.
* " 5,364	New South Wales.
" 9,316	Western Australia.
" 11,182	South Australia.

Particulars of CAPE RACE Lighthouse.

Colony?—Newfoundland.
 Name of Light?—Cape Race.
 Where situated?—Cape Race. Lat. 46° 39' 12" N. Long. 53° 2' 38" W.
 Description of Lighthouse?—Circular iron tower, striped red and white, vertically.
 Height from base to vane?—50 feet.
 Height from high water to centre of lantern?—180 feet.
 Character of Light?—Fixed catoptric light of natural colour, 13 argand lamps, 13 parabolic reflectors.
 Seen in clear weather?—17 miles.
 Erected in year?—1856.
 Cost of erection?—Lantern and apparatus, 1,906*l.* 16*s.* 3*d.*; tower, dwelling-houses, freight, labour, commission, &c., &c., 5,452*l.* 5*s.* 2*d.* Total, 7,358*l.* 18*s.* 8*d.*
 By whom erected?—Imperial Government.
 Maintenance:
 Description of oil used?—Pale seal.
 Number of gallons of oil consumed per annum?—About 600.
 Number of Lightkeepers?—Two; in the winter months a third person is employed.

* The lights in the Bahamas and Falkland Islands are under the control of the Board of Trade. The lights at Breaksea Island and Point King, in Western Australia, were erected by the Board of Trade, and are to be maintained for the present by the Imperial Government.

Annual salaries of Lightkeepers, and allowances?—Principal, 100*l.* salary; 32*l.* 6*s.* 1*d.* (currency) for fuel. Assistant, 70*l.* salary; 15*l.* (currency) for fuel.

Average annual cost?—Estimated at 300*l.*

By whom maintained?—A toll of one-sixteenth of a penny per ton is levied for the maintenance, and to repay the cost of erection; but the tolls collected have not as yet realized sufficient for the maintenance of the light, and the deficiency is made up from imperial funds.

Particulars of the CERIGO LIGHTHOUSE, in the IONIAN ISLANDS.

Name of Light?—Cerigo.
 Situation?—Cape Spathi. Lat. 36° 22' 50" N., Long. 22° 57' 30" E.
 Description of Lighthouse?—Circular Stone Tower, surmounted by a lantern painted white.
 Height in feet from base to vane?—83 feet.
 Height in feet from high water to centre of lantern?—363 feet.
 Order?—First order.
 Character of Light?—Revolving white light; catoptric.
 Distance seen in clear weather?—24 miles.
 Year of erection?—1857.
 Cost of erection?—Lantern, 1,071*l.*; Lighting Apparatus, 826*l.* 19*s.* 6*d.*; tower, dwellings, freight, labour, furnishing, commission, &c., 2,989*l.* 6*s.* 10*d.*—Total 4,887*l.* 6*s.* 4*d.*
 By whom erected?—Imperial Government.
 Oil?—Rapeseed.
 Number of gallons used?—No information.
 Number of Lightkeepers?—Two.
 Salaries of Lightkeepers and allowances (if any)?—No information.
 Average annual cost?—No information.
 By whom maintained?—A contribution of 300*l.* towards the annual maintenance of the Light is paid by the imperial Government. The balance is made up by the Ionian Government.

CORRESPONDENCE with the BOARD of TRADE on COLONIAL LIGHTS.

Royal Commission, Lights, Buoys, and Beacons,
 7, Millbank Street, S. W.

SIR, January 9, 1860.
 I AM directed to call your attention to your letter of the 9th of February 1859, No. 1159, and to the copy of a letter enclosed therein, dated 28th of July 1856, addressed to H. Merivale, Esq., Colonial Office, and to the following paragraph in the latter:—"Since the control of Colonial Lighthouses has been vested in this Board, my Lords consider it most desirable that they should be informed of any Lighthouses which have been erected since the above-mentioned period," &c., &c., &c.; and I am directed to enquire what is the nature of the control, if any, exercised by the Board of Trade over Colonial Lighthouses other than those specified in your letter of the 9th of February inst.

2ndly, With reference to the Lighthouses named in your letter of the 9th of February 1859, and other Lighthouses erected and maintained or to be erected by imperial funds, I am directed to request that you will favour the Commission with a short statement of the system now in force for the construction, maintenance, and control of the Colonial Lighthouses under the superintendence of Her Majesty's Government, including in the statement the names of any other departments to which reference is made, and the course which such references take before being finally dealt with by the Board of Trade, previous to establishing a new Lighthouse in any of Her Majesty's colonies.

3rdly, With reference to Parliamentary paper 355, ordered to be printed 29th of June 1855, I am directed to enquire whether any bill has been drawn up, as suggested by the Lords of the Committee of Privy Council for Trade in the letter of the 19th of January, 1855.

If such a bill has been introduced or passed; and if not, I am to request that copies of any correspondence that may have passed on the subject may be furnished to the Commission.

I am, Sir,
 Your obedient Servant,
 J. F. CAMPBELL,
 Secretary.

T. H. Farrer, Esq.,
 Board of Trade.

Office of Committee of Privy Council for Trade,
 Marine Department, Whitehall.

SIR, 25th January, 1860.

I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your

II.

letter of the 9th instant, requesting certain information as regards the nature of the control exercised by the Board of Trade over Colonial Lighthouses.

In reply, my Lords direct me to state to you, for the information of the Royal Commissioners on Lights, Buoys, and Beacons, as follows:—

1st. The Board of Trade exercises no control over any Colonial Lighthouses except over those specified in the letter from this department of the 9th of February last, and over two Lighthouses at Vancouver's Island, for which a sum has been voted by Parliament since the date of that letter.

2nd. The system in force for the construction, maintenance, and control of Colonial Lighthouses varies according to the circumstances of the respective colonies and of the respective Lighthouses. For instance, the Lighthouses in the Bahamas and in the Falkland Islands have been erected and are maintained entirely out of imperial funds, and are entirely under the control of the Board of Trade, inasmuch as the colonies are small and the lights are maintained for the benefit of the passing trade.

The Lighthouses at King George's Sound, Western Australia, have been erected and are to be maintained by imperial funds until such time as the colony is in a position to maintain them itself.

The Lighthouse at Cerigo was erected with imperial funds, and is maintained jointly by Her Majesty's Government and the Ionian Government.

A sum of seven thousand pounds (7,000*l.*) has been voted by Parliament for the erection of the Cape Point Lighthouse, Cape of Good Hope; three thousand five hundred pounds (3,500) of which sum is to be repaid by the colony; and the Lighthouse is to be maintained by the colony.

The cost of erection of the Roman Rocks Lighthouse, at the Cape of Good Hope, is to be borne by imperial funds—the cost of maintenance by the colony.

The Cape Race Lighthouse was erected with imperial funds, to be repaid and maintained by a toll on shipping under the provisions of the Act 18 and 19 Vict. c. 91, herein after referred to.

A sum of seven thousand pounds (7,000) has been voted by Parliament for the erection of the two Lighthouses above mentioned at Vancouver's Island; three thousand five hundred pounds (3,500) of which sum is to be repaid by the colony, and the Lighthouses are to be maintained by the colony.

The course taken in first proposing a Lighthouse and in constructing it, differs almost in every case. Sometimes the light is asked for by the trade, sometimes by the colony, sometimes by the Admiralty. In many cases the colony erects the light itself, and seeks for no assistance or advice from the Home Government. In other cases the colony asks for advice and for help in sending out apparatus from this country at the cost of the colony. In other cases application is made to the Home Government to bear the cost. Whenever the Home Government has to take any part in the matter, the case is referred to the Board of Trade. When so referred, that department is in the habit of communicating with the Admiralty on the character of the light, and on all nautical questions connected with it, though they consider themselves responsible for the decision which may be come to. If it is thought expedient from the nature of the trade which is benefited, or for other reasons, that the cost should be borne wholly or in part by imperial funds, the case is submitted by the Colonial Office or the Board of Trade, as the case may be, for the consideration of the Treasury as to the expediency of obtaining a vote from Parliament for such sums as are required. The expenditure of these sums, as well as any other steps which have to be taken in this country, rest with the Board of Trade.

In the discharge of this duty they have occasionally asked the co-operation of the Trinity House. The further steps to be taken in the colony in erecting the light are taken under directions given by the Board of Trade, either through the colonial authorities, or through an agent sent from this country, and under superintendence of an engineer appointed by the Board of Trade.

In the cases of the Great Isaacs, Lobos Cay, Cape Race, Cape Point, Roman Rocks, and Great Basses Lighthouses, the whole of the materials were sent from this country, and an engineer was also sent to superintend their construction.

The stone for the Cerigo Lighthouse was quarried in that island, and the construction of the Lighthouse was superintended by an engineer from this country.

The materials for the King George's Sound Lighthouses were sent from this country; and their construction was superintended by an officer of the Royal Engineers, assisted by a working party from that corps.

The Lighthouses at Vancouver's Island are now being built under the superintendence of the colonial authorities;

4 L

and the lanterns and lighting apparatus have been supplied from this country.

As a general rule, it may be stated as regards Lighthouses once erected, that when they are maintained by a colony, the Board of Trade exercises no control whatever over them; when the Imperial Government is at the cost of maintenance, the Board of Trade undertakes the management.

3. In answer to the third question proposed in your letter, I am to state that the Act 18 and 19 Vict. c. 91, to facilitate the erection and maintenance of Colonial Lighthouses, was passed in accordance with the recommendations contained in the Parliamentary Paper 355, of 1855. The provisions of this Act have, however, been only acted upon in the case of the Cape Race Lighthouse, in respect of which a toll is levied on shipping deriving benefit from the light.

I have the honour to be,

Sir,

Your obedient servant,

T. H. FARRER.

The Secretary to the Royal Commission on
Lights, Buoys, and Beacons,
7, Millbank Street.

Royal Commission, Lights, Buoys, and Beacons,
7, Millbank-street, S.W.

LONDON, 3rd February 1860.

SIR, I AM directed to request that you will move the Lords of the Committee of Privy Council for Trade to cause the Commissioners to be furnished with—

1st. A short abstract of the memorials and applications for Lighthouses or light-vessels "On or near the coasts of any British possession," addressed to the Board of Trade, since the 14th August 1855 to the present date inclusive; showing by whom the application or memorial was made, and also abstracts of the several replies thereto, together with a short statement showing the final result of the application in each case.

2d. And the Commissioners would wish to be informed, with reference to section 2 of the 18 & 19 Vict. c. 91., whether any, and if so what, applications have been received requesting that any existing Lighthouse or light-vessel on or near the coasts of any British Possessions should be brought under the provisions of sections 3 to 8 inclusive of that Act.

I am, Sir,

Your obedient servant,

J. F. CAMPBELL,
Secretary.

T. H. Farrer, Esq.
&c. &c.

Office of Committee of Privy Council for Trade,
Marine Department,
Whitehall, 25th February 1860.

SIR, I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 3rd instant, requesting to be furnished with a short abstract of the memorials or applications for Lighthouses on or near the coasts of any British Possession addressed to the Board of Trade since the 14th August 1855, and also to be informed what applications have been received for any existing Lighthouse on or near the coasts of any British Possession, to be brought under the provisions of sections 3 to 8 inclusive of the Act 18 & 19 Vict. c. 91.

In reply I am to transit to you for the information of the Royal Commissioners on Lights, Buoys, and Beacons, the enclosed short statements showing the applications which have been made to the Board of Trade for such Lighthouses, and also the result in each case, so far as it can be given.

It will be observed that these statements do not include the applications for the Lighthouses specified in the letter from this Department, of the 9th February 1859, which have been erected, or are now being erected, under the superintendence of the Board of Trade.

I am, Sir,

Your obedient servant,

T. H. FARRER.

The Secretary to the Royal Commission on
Lights, Buoys, and Beacons, 7, Millbank Street, S.W.

No. 1.

APPLICATIONS addressed to the Board of Trade for Lighthouses or Lightvessels on or near the Coasts of any British Possession, since the 14th August 1855 to the present Time.

Date of Application.	From whom received.	Nature of Application.	Short Statement of the Case.	Result of Application.
1856. Feb.	Governor of Hong Kong, through the Colonial Office.	For a lighthouse on Prater Shoal in the China Sea.	It is proposed that foreign governments should be requested to contribute towards the erection and maintenance of two or more lights on this shoal, by agreeing to a toll on their vessels trading to and from Chinese ports through the China sea, and returns of tonnage of vessels entering and clearing Chinese ports for one year has been called for, from Her Majesty's Consuls at Shanghai, Amoy, Canton, Fou-chou-foo, Ningpo, and from the authorities at Hong Kong. The authorities at Hong Kong have also been requested to furnish full particulars as regards the probable cost of the establishment of two lights and their future maintenance. Until the above information has been received, the question remains under consideration.	Still under consideration.
Sept.	Prince Edward Island, through Colonial Office.	For the erection of lighthouses on North Cape and East Point, Prince Edward Island.	Governor of Prince Edward Island informed, that the consideration of these lights must be postponed until the opinions of the other British North American Colonies are obtained; and requesting the Governor to furnish information as regards the sites, the building materials, &c. obtainable in the colony.	As this information has not been received from Prince Edward Island, the consideration of the subject is postponed.
1857. Jan.	American Government.	For the erection of lighthouses in the Bahamas, at— 1. Mantilla Reef. 2. West end of Great Bahama Bank. 3. North-east point of Great Abaco. 4. North point of Eleuthera Island. 5. Sturup Cay. 6. Orange Cay.	The resident engineer of the Board of Trade superintending the construction of the lighthouses on the Great Isaac and Lobos Cay, has been instructed to report— 1. At what places in the Bahamas does the trade require lights; and of the lights required, which are the most important? 2. How far will engineering difficulties allow of lighthouses being erected on the spots selected? And he has been specially ordered to survey the Little Bahama Bank, examining particularly— 1st. Memory Rock. 2d. The north-west point of Inagua Island, No. 4th, Castle Rock, Crooked Island.	Report not yet received, and result not arrived at.
Mar.	Governor of Canada, through the Colonial Office.	For the erection of a lighthouse on the Bird Rocks or Brun Island, or in that locality to the north east of the Magdalen Group.	Governor of Canada requested to furnish particulars to the proposed site, building materials, &c., and to ascertain in which British North American colony, the island is situated.	Governor of Newfoundland states, that there is no objection to the light, but the island does not belong to Canada. Governor of Prince Edward Island states that that colony does not feel itself called upon to contribute towards the light, and that the island belongs to Canada. No reply received from the other British North American Colonies.
1858. Nov.	Governor of New Zealand, through the Colonial Office.	Requesting that lighthouses in the colony of New Zealand may be erected from imperial funds, and stating that plans and estimates would be forwarded.	Governor informed, that until plans are forwarded my Lords cannot take into consideration the question of erecting lighthouses in the colony.	No plans received.

Date of Application.	From whom received.	Nature of Application.	Short Statement of the Case.	Result of Application.
1859, Jan.	Governor of Vancouver's Island, through the Colonial Office.	For the erection of light-houses on Race Rocks and Esquamault Harbour.	A vote of 7,000l. was granted in session of 1859, half to be repaid by colony. The lighting apparatus and lanterns have been sent out from this country, and the towers of the light-houses and buildings connected therewith are in course of construction by the colonial authorities.	See previous column.
June	Governor of Natal, through the Colonial Office.	For the erection of a lighthouse on the bluff off the Port of Natal.	Governor informed, that this light is chiefly, if not entirely, required for vessels bound to Natal, and that, under these circumstances, it is not a case in which the Board of Trade can recommend the Treasury to ask for a vote from the Imperial Parliament.	Declined.
Sept.	Royal Mail Steam-packet Co. and Lloyd's.	For the erection of a lighthouse on the island of Sombrero, in the West Indies.	A correspondence has taken place between the Colonial Office and the Foreign Office as to the national title to the island of Sombrero, which is in the possession of Americans. Nothing can, therefore, be done at the present moment towards the erection of a lighthouse by the British Government.	Still under consideration.
Oct.	Governor of Bermuda, through the Colonial Office.	For the erection of a second lighthouse in the Bermudas.	Governor informed, that the Board of Trade concurred with him as to the importance of a second lighthouse in the Bermudas, and that its importance is such as to justify an application of imperial funds towards the erection. Governor requested, in order to ascertain the best site for a second lighthouse, to cause a survey to be made of North Rock as well as of the north end of St. George's Island near Catherine Point, and to furnish the plans and estimates of the probable cost of erecting lighthouses in those positions.	Reply not yet received. Still under consideration.

No. 2.

APPLICATIONS received requesting that any existing Lighthouse or Lightvessel on or near the Coasts of any British Possession should be brought under the Provisions of the Sections 3 to 8, inclusive, of the 18 & 19 Victoria, c. 91.

From whom received.	Names of Lighthouses.	Result of Application.
Governor of Newfoundland, through the Colonial Office.	Cape Race	Tolls are collected in respect of this light under an Order in Council.
Ditto	Cape Pine	Deferred until it is ascertained how far the collection of tolls answers in respect of Cape Race light.
Governor of Cape of Good Hope, through the Colonial Office.	Mouille Point, Green Point, Agulhas, Recife, Bird Island, Port Elizabeth, Buffie Mouth.	The Governor informed, that the Board of Trade considers that these lights should be maintained by the colony, and not by tolls imposed in this country.
Governor of Falkland Islands, through the Colonial Office.	Cape Pembroke	It has not been thought expedient to levy a toll in respect of this light.

Office of Committee of Privy Council for Trade,
Whitehall, 27th February 1860.

SIR,

I AM directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 15th instant, transmitting certain general and special printed forms, and requesting my Lords to cause them to be filled up as returns relating to the Colonial lighthouses, which are under the superintendence of H. M. Government.

In reply, my Lords, direct me to state that, though anxious to give all the information in their power, they are at a loss to know how to complete the returns now asked for.

In the first place, the forms transmitted by you, which seek for very detailed information so far back as the year 1845, at which time this Board had nothing to do with Colonial lighthouses, are the same as those sent to the Lighthouse Boards in this country and would appear to have reference to a case where a large system of lights is managed by one authority, rather than to the rare and exceptional case of the Colonial lighthouses referred to, which are only managed by the Home Government where there is no local government to which they can well be committed.

In the second place, my Lords, desire me to call the attention of the Commissioners to the fact that they have already given to the Commissioners all, or nearly all, the information in their power with respect to these lighthouses, and I am to request that you will call the attention of the Commissioners to the letters from this department of the 9th February and 5th and 9th July 1859, and of the 25th January last, and of the 25th instant, from which it will be seen that the greater part of the information now sought for, so far as it can be given at all, has already been supplied.

The letter of the 9th February 1859 gives a list of the Colonial lighthouses under the superintendence of the Board of Trade.

The letter of the 5th July encloses a return of those in course of construction, showing the money already expended and the probable cost of completion.

The letter of the 9th July forwards certain returns, in original, furnished by the Colonial authorities relating to the lighthouses in the respective colonies, which appear to my Lords to give (with the separate statement enclosed relating to the light at Cape Race, Newfoundland, and the light at Cerigo) most, if not all, the information required by the Commissioners for the other Colonial lighthouses under the superintendence of the Board of Trade, so far as it can be given at all.

The letter of the 25th January, 1860, states the system in force for the construction, maintenance, and management of Colonial lighthouses.

The letter of the 25th instant incloses a statement of applications for new lighthouses in the colonies, and also a statement of applications received requesting that any existing lighthouse in the colonies should be brought under the provisions of the 18 & 19 Vict. c. 91. in respect of levying tolls.

If the Commissioners will state specifically the information they require, in addition to that already furnished them in respect of the lighthouses in the colonies under the superintendence of this department, and specified in the letter of the 9th February 1859, my Lords will have much pleasure in causing such information to be supplied as far as it can be obtained from the documents in this office.

I am, &c.,

T. H. FARRER.

Royal Commission, Lights, Buoys, and Beacons,
7, Millbank Street, S.W.,

London, March 3.

SIR,

I AM directed by the Commissioners appointed by the Queen to inquire into the condition and management of lights, buoys, and beacons, to acknowledge the receipt of your letter of the 27th ultimo, and to express their great regret that the printed forms sent on the 15th ultimo were not accompanied by a statement to the effect that the Commissioners were well aware that some of the questions, especially as regards date, were only partially applicable to Colonial lights. The forms were drawn up with a reference to all the authorities indicated by the Commission, and they necessarily contain some questions which apply to particular cases only.

Similar forms have been sent to the local authorities, referred to in your letter of the 9th of February 1859, as

well as to those named in the Mercantile Marine Articles, and of these (upwards of 110 in number) nearly all have either filled up the forms, or are now engaged on them. These authorities have left blanks where the questions were not applicable to the lights, buoys, or beacons under their control, and for the sake of uniformity, and to facilitate comparison, the Commissioners had wished to be furnished with similar returns for the Colonial lights under the superintendence of H. M. Government.

The Commissioners most readily admit that the letters and papers forwarded by desire of the Lords of the Committee of Privy Council for Trade contain much of the information which they wished to obtain, they had already carefully considered these papers and documents. They had abstracted portions of the information, and they are willing to make use of it so far as it goes; but they feel that they cannot publish an abstract made by them as a return furnished by the Board of Trade, and they would prefer that there should be no exception to the otherwise general rule that governing authorities should furnish returns in the same form.

The Commissioners appreciate the offer of their Lordships to supply additional information from documents in their office. They are most unwilling to give unnecessary trouble, and would greatly regret that the forms which they have adopted should be considered as going too much into detail, but the Commissioners would be greatly obliged to their Lordships if they would cause such answers to be prepared, as the information in their possession will enable them to give, in reply to the questions contained in the printed form, dating from the period when the superintendence of certain Colonial lights was first placed under the control of the Lords of the Committee of Privy Council for Trade.

I have, &c.
(Signed) J. F. CAMPBELL.

Royal Commission, Lights, Buoys, and Beacons,
7, Millbank Street, S.W.,

SIR, London, March 3, 1860.

REFERRING to my letter of this date, &c. I am directed to return the papers forwarded to this office by desire of their Lordships on the 9th of July 1859. These papers have been filed and arranged, and they are now returned in case they may be required in the preparation of answers to the printed questions forwarded on the 15th ultimo.

The Commissioners may have occasion to request a further loan of these papers before completing their colonial inquiries.

I have, &c.
J. F. CAMPBELL,
Secretary.

Office of Committee of Privy Council for Trade,
Marine Department,
Whitehall, May 14th, 1860.

SIR, WITH reference to your letter of the 3rd March last on the subject of certain returns required by the Royal Commissioners of Lights, Buoys, and Beacons relating to the Colonial lighthouses under the control of the Board of Trade: I am directed by the Lords of the Committee of Privy Council for Trade to transmit to you the enclosed printed forms with such replies to the queries as it is practicable to give.

I am, &c.
J. H. FARRER.

The Secretary to the Royal Commission,
Lights, Buoys, and Beacons,
7, Millbank Street.

Royal Commission, Lights, Buoys, and Beacons,
7, Millbank Street, S.W., London,

SIR, 15th December 1860.
WITH reference to a letter of the 8th December 1854 from the Board of Trade to the Board of Admiralty, I am directed to inquire whether a certain step which the Lords of the Committee of Privy Council for Trade proposed to take in a certain contingency, and certain other steps which their Lordships suggested that the Board of Admiralty should take in the same contingency, have been taken, to wit:—

(a.) "That a full record would be kept at this office of all the lights in the Queen's dominions in a methodical

manner, for the information of Her Majesty's Government and of mariners."

(b.) "The officers commanding Her Majesty's ships might be requested to report to the Admiralty upon the efficiency of the several lights."

(c.) "That the above reports might be communicated to and registered by this Board."

(1.) If, after the first step (a) has been taken, the Commissioners would be glad if they might be furnished with the "full record" referred to.

(2.) If the steps (b) and (c) have been taken, the Commissioners would be glad to be allowed to see such reports as were forwarded since 8th December 1854 from the officers of Her Majesty's ships to the Admiralty and communicated to and registered by the Board of Trade.

(3.) The Commissioners would like to be informed also whether the Board of Trade receive full annual returns of inspection of all the lighthouses in the colonies under their whole or partial control, and whether the machinery at their disposal enables them or their officers to maintain any (and, if any, what amount of) efficient control, under the heads of "efficient lighting" and "economy of oil and stores."

For the convenience of their Lordships, I am directed to enclose a printed copy of the correspondence above referred to.

I am, &c.
(Signed) J. F. CAMPBELL,
Secretary.

T. H. FARRER, Esq.,
&c. &c.

Office of Committee of Privy Council for Trade,
Marine Department, Whitehall,
21st December 1860.

SIR, I am directed by the Lords of the Committee of Privy Council for Trade to acknowledge the receipt of your letter of the 15th instant, requesting to be informed what steps have been taken as regards certain suggestions relating to colonial lighthouses contained in the letter from the Board of Trade to the Admiralty of the 8th December 1854.

In reply, I am to state that a letter was addressed to the Colonial Office on the 15th August 1855 (copy of which is enclosed), enclosing a pamphlet for distribution to the various colonies. A letter dated the 28th July 1856 was also addressed to the Colonial Office (as you were informed by their lordships' letter of the 5th February 1859), forwarding queries to be filled in by the colonial authorities respecting their lights. The returns to these queries were forwarded to the Lighthouse Commission in original, being too voluminous to copy.

These returns are the only records kept in this office respecting colonial lights, as the Admiralty publish periodically a list of all lights for general information, and my Lords cause all notices received at the Board of Trade relating to the exhibition of lights in the various colonies to be forwarded immediately to that department for publication.

My Lords have not considered it advisable to carry into effect the suggestion that the officers commanding Her Majesty's ships might be requested to report generally to the Admiralty upon the efficiency of the several lights in the colonies, as these lights (with the exception of those under the control of the Board of Trade) belong to and are managed solely by the colonial authorities, upon whom falls the responsibility of keeping them efficient, and with whose management, except by their own express desire, the Board of Trade could not interfere with advantage.

As regards the information requested respecting the colonial lighthouses under the control of the Board of Trade, I am to state that (as has been already pointed out to the Commissioners), the circumstances are so various that it is impossible to have any uniform system. The lighthouse at Cerigo has been reported on by Captain Spratt, R.N., and the lighthouses in the Bahamas have undergone thorough inspection by Mr. Harvey, the colonial engineer, and by Mr. Scott, who has been superintending the construction of new lighthouses there. Provision has also been made for a periodical inspection of these lighthouses by Mr. Harvey at short intervals. But the Board of Trade does not receive regular annual returns of the inspection of these or other lighthouses, as the immediate management of them rests with the Governor, who always reports when matters of special importance render it necessary that the matter should be referred to the Board of Trade.

With reference to the machinery at the disposal of the Board of Trade to maintain control over the lighthouses under the heads of "efficient lighting," and economy of oil

and stores, I am to state that my Lords have up to the present time found the establishments under the control of the several governors sufficient for the purpose. Such establishments vary in the several colonies.

In the Bahamas there is a staff consisting of a superintendent, an inspector, clerk, and storekeeper. In Newfoundland the Board of Works manage. In other colonies the Governor calls in the assistance of the colonial secretary and the surveyor general.

The lightkeepers make quarterly returns to the colonial authorities on printed forms prepared by the Board of Trade, showing the consumption of oil and stores and the quantities remaining in store. These returns are then transmitted by the Governor to the Board of Trade for examination.

The oil and stores required for the lighthouses are supplied by this department from this country on receiving requisitions from the Governors.

The oil is furnished by the Trinity House out of the large quantity provided under contract for the English lighthouses, and the contract price is repaid out of the parliamentary vote to the Mercantile Marine Fund. The other stores are purchased from the contractor at the contract prices at which they are supplied to the Trinity House for English lights.

The Secretary to
the Commission on
Lights, Buoys, and Beacons.

I am, &c.
T. H. FARRER.

Office of Committee of Privy Council for Trade,
Whitehall, 15th August 1855.

SIR, WITH reference to your letter of the 6th instant, I am directed by the Lords of the Committee of Privy Council for Trade to transmit to you for distribution to the various colonies the accompanying copies of the printed memorandum relating to lighthouses and lightvessels in the colonies.

My Lords have not before replied to the above-mentioned letter, as it appeared to them that it would be desirable in transmitting the memorandum in question to the colonial authorities to call the attention of the governor and other officers to those provisions of the Merchant Shipping Act Amendment Act, 1855, which relate to the collection of dues for the maintenance and erection of colonial lights. If Secretary Sir William Molesworth should think such a course expedient, the following are points which will, in my Lords' opinion, require special attention.

1. That the object contemplated by the Imperial Legislature is to assist the colonies in erecting and maintaining lighthouses, by providing funds for the purpose by means of tolls levied on the ships which derive benefit from the lights, whether those ships go to ports in the colony in which the light is situated or not.

2. That the principle upon which the tolls are to be fixed and collected is the same as that adopted in this country.

3. That provision is made for procuring advances for building as well as an annual income for maintaining lights.

4. That whilst no colony can be required to levy a tax against its will, the money when paid must of necessity (being levied in different colonies as well as in the United Kingdom) be under the control of the Imperial Government.

5. That it is not the wish or the intention of the Board of Trade in administering any funds so levied to interfere with the local authorities, who will still have the management of the lights, except so far as may be necessary to ensure proper accounts and a proper expenditure of the public money.

6. That whenever any application is made for assistance towards erecting or maintaining a light, the Governor of the

colony should send all the information in his power as to the number and tonnage of vessels passing or deriving benefit from the light, and the ports and places to or from which they trade. In giving this information, attention should be paid to the particular circumstances of the case, so that the Imperial Government may be enabled in fixing the toll to determine what the amount should be, and at what ports it will be desirable to collect it. As a general rule it will probably be found most convenient to collect the dues at the port of departure of the ship, rather than at the port of arrival, where both ports are British ports; but the application of this rule must depend upon the circumstances of each case.

7. Where a light is to be erected or maintained in one colony and tolls will have to be taken in other colonies, the communications from the first colony should be so made as to enable Her Majesty's Government to communicate as early and as effectively as possible with the latter colonies.

I am to add that as regards India my Lords have addressed a similar communication to the Board of Control.

They have also addressed to you a separate letter on the subject of the tolls for the light to be erected on Cape Race, and another separate letter as to the proposed light on the Basses Rock, Ceylon, and as regards the latter they have also communicated with the Board of Control.

I have, &c.
H. Merivale, Esq.,
Colonial Office.

(Signed) T. H. FARRER.

LIGHTHOUSES.

(GENERAL RETURN.)

This Return is not applicable to the lighthouses under the superintendance of the Board of Trade.

TABLE OF PRICES.

GUN CAY, BAHAMAS.	
Price	- - - 67 <i>l.</i> 9 <i>s.</i> 9 <i>d.</i>
Ordinary repairs	- - - - -
Oil	{ Consumption - about 12 galls.
	{ Cost - - - 2 <i>l.</i>
Wicks	{ Consumption - about 40.
	{ Cost - - - about 8 <i>d.</i>
ARACO, BAHAMAS.	
Price	- - - 67 <i>l.</i> 9 <i>s.</i> 9 <i>d.</i>
Ordinary repairs	- - - - -
Oil	{ Consumption - about 12 galls.
	{ Cost - - - 2 <i>l.</i>
Wicks	{ Consumption about 40.
	{ Cost - - - about 8 <i>d.</i>
CAY SAL, BAHAMAS.	
Price	- - - not known.
Ordinary repairs	- - - - -
Oil	{ Consumption - about 12 galls.
	{ Cost - - - 2 <i>l.</i>
Wick	{ Consumption about 4 feet.
	{ Cost - - - about 1 <i>s.</i> per ft.
CAPE PEMBROKE, FALKLAND ISLANDS.	
Price	- - - not known.
Ordinary repairs	- - - - -
Oil	{ Consumption - about 10 galls.
	{ Cost - - - 1 <i>l.</i> 13 <i>s.</i> 4 <i>d.</i>
Wicks	{ Consumption, about 50.
	{ Cost - - - about 10 <i>d.</i>

CIRCULAR III.

RETURN FROM BOARD OF TRADE ON COLONIAL LIGHTHOUSES.

GUN CAY, BAHAMAS.

3. The Governor, assisted by the Colonial engineer, who is inspector of lighthouses, and the commissariat officer.
7. For a guide to vessels passing through the Gulf of Florida.
8. 1836.
10. Sea light.
11. Conical stone tower, painted the lower part to the height of 16 feet white, the remaining part red.
12. Two detached conductors, a few feet distant from the tower on opposite sides, consisting of iron rods, supported by spars, the rods terminating in the ground at right angles to the spars.
13. 47 feet.
14. 72 feet.
15. 9.8 miles.
16. 12 miles.
17. The whole circle, excepting between S. by W. and S. $\frac{1}{4}$ E.
18. Revolving white light.
19. One minute and a half.
20. From sunset to sunrise.
21. Catoptric.
22. 15 burners.
24. Messrs. Wilkins & Co., 24, Long Acre.
25. By pedestal tubes in the lantern, with ventilating plates.
29. Cost 3,177*l*.
31. Dimension, 14 feet diameter; cost 538*l*. 16*s*. 8.
33. Cost of repairs in 1858, included in the expenditure for 1858. See Query No. 4.
35. One light-keeper at 84*l*. per annum; one ditto, at 60*l*. Rations allowed. See also Query 57.
36. 676*l*. 9*s*. 9*d*.
38. Oil, 1857, 560 galls.; 1858, 576 galls. Wicks, „ 970; „ 1750.
39. Rape seed, 1857, 4*s*. per gallon; 1858, 3*s*. 3*d*. per gallon.
40. Argand wicks, 2*s*. 6*d*. per gross. Cost, 1857, about 17*s*.; 1858, about 1*l*. 10*s*.
42. Annual vote in Parliament.
44. Expenditure in 1858, 1,080*l*.; including repairs.
50. By the inspector of lighthouses in the Bahamas.
54. Barometer and thermometer.
57. A supernumerary light-keeper is stationed at Nassau, and the keepers are relieved at such periods as the inspector of lighthouses thinks fit.
58. See printed copy of Instructions to Light-keepers, attached.

ABACO, BAHAMAS.

3. The Governor, assisted by the Colonial engineer, who is inspector of lighthouses, and the commissariat officer.
7. For a guide to vessels passing through the Providence Channel.
8. 1836.
10. Sea light.
11. Conical stone tower, rendered externally in Roman cement; the lower part to the height of 23 feet 4 inches painted white, the remaining part red.
12. Same as at Gun Cay.
13. 59 feet 6 inches.
14. 155 feet.
15. 14 $\frac{1}{3}$ miles.
16. 16 miles.
17. Visible to the north-east and round southerly to WNW.
18. Revolving white light.
19. Once a minute.
20. From sunset to sunrise.
21. Catoptric.
22. 15 burners.
24. Messrs. Wilkins, 24, Long Acre.
25. By pedestal tubes in lantern, with ventilating plates.
29. Cost, 3,967*l*.
31. Dimension, 14 feet diameter. Cost, 538*l*. 16*s*. 9*d*.
33. Cost of repairs in 1858 included in the expenditure for 1858. See Query No. 4.
35. One light-keeper at 84*l*. per annum; one ditto at 60*l*. Rations allowed. See also Query 57.
36. 676*l*. 9*s*. 9*d*.
38. Oil, 1857, 525 galls., 1858, 533 galls. Wicks, „ 1898; „ 1710.
39. Rape seed, 1857, 4*s*. per gall., 1858, 3*s*. 3*d*. per gall.
40. Argand wicks, 2*s*. 6*d*. per gross; 1857, about 1*l*. 13*s*.; 1858, about 1*l*. 10*s*.
42. Annual vote in Parliament.
44. Expenditure in 1858, 1,080*l*. including repairs.
50. By the inspector of lighthouses in the Bahamas.
54. Barometer and thermometer.
57. Same as at the Gun Cay lighthouse.
58. Same as for the Gun Cay lighthouse.

CAY SAL BANK,
BAHAMAS.

3. The Governor, assisted by the Colonial engineer, who is inspector of lighthouses, and the commissariat officer.
7. For a guide to vessels passing through the Gulf of Florida.
8. 1839.
10. Sea light.
11. Limestone, rendered externally with Roman cement; painted in oil; the lower part to the height of 16 feet white, the upper part red.
12. Same as at Gun Cay.
13. 57 feet 9 inches.
14. 96 feet 1 inch.
15. 11 $\frac{1}{2}$ miles.
16. 14 miles.
17. The whole circle except on the bearing SW. $\frac{1}{4}$ W.
18. Fixed white light.
20. From sunset to sunrise.
21. Dioptric.
22. First order.
24. Messrs. Wilkins, 24, Long Acre.
25. By pedestal tubes in lantern, with ventilating plates.
29. Cost 3,804*l*.
31. Dimensions, 14 feet diameter. Cost 538*l*. 16*s*. 9*d*.
33. Cost of repairs in 1858 included in the expenditure for 1858. See Query No. 4.
35. One lighthouse-keeper at 84*l*. per annum; one ditto at 60*l*., with rations. See also Query 97.
38. Oil, 1857, 612 galls.; 1858, 564 galls. Wicks „ 45 yards; „ 35 yards.
39. Rape seed, 1857, 4*s*. per gallon; 1858, 3*s*. 3*d*. per gallon.
40. Concentric wicks 9 $\frac{1}{2}$ *d*., 7 $\frac{1}{2}$ *d*., and 5 $\frac{1}{2}$ *d*. per yard. 1857, about 1*l*. 7*s*.; 1858, about 1*l*. 2*s*.
42. Annual vote in Parliament.
44. Expenditure in 1858, 1,080*l*. including repairs.
50. By the inspector of lighthouses in the Bahamas.
54. Barometer and thermometer.
57. Same as at the Gun Cay lighthouse.
58. Same as for the Gun Cay lighthouse.

GREAT ISAACS,
BAHAMAS.

3. The Governor, assisted by the Colonial engineer, who is inspector of lighthouses, and the commissariat officer.
5. The erection of this lighthouse was handed over by the Admiralty to the Board of Trade in 1856.
7. For a guide to vessels passing through the Gulf of Honda and through the Providence Channel.
8. 1st August 1859.
9. Constructed in England under contract by Messrs. Gressell for the Admiralty; engineer for erection, Mr. Alexander Gordon; erected under the superintendence of a resident engineer sent out from this country.
10. Sea light.
11. Iron tower, lined with sheet iron, and painted with broad red and white horizontal bands.
13. 145 feet.
14. 158 feet.
15. 14.4 miles.
16. 16 miles.
17. The whole circle.
18. Revolving white light.
19. Half a minute.
20. From sunset to sunrise.
21. Catoptric.
22. 21 burners.
24. Messrs. Wilkins, 24 Long Acre.
25. Globe head, top of lantern, and ventilators in plinth.
29. About 14,300*l.*, account not yet closed.
31. Dimension, 13 feet diameter. Cost, 997*l.*
35. One light-keeper at 84*l.* per annum, one do 60*l.* do. Rations allowed. See also Query 57.
36. 898*l.*
39. Rape seed.
40. Argand wicks, 2s. 6*d.* per gross.
42. Annual vote in Parliament.
54. Barometer and thermometer.
57. Same as at the Gun Cay lighthouse.
68. Same as for the Gun Cay lighthouse.

LOBOS CAY BAHAMA-
MAS.

3. The Governor, assisted by the Colonial engineer, who is inspector of lighthouses, and the commissariat officer.
5. The erection of this lighthouse was handed over by the Admiralty to the Board of Trade in 1856.
7. For the Cuba trade and chiefly for the mail steamers.
8. 31st March 1860.
9. Contracted in England under contract by Messrs. Easton and Amos; engineer Mr. Alexander Gordon; erected under the superintendence of a resident engineer sent out from this country.
10. Sea light.
11. Iron tower, lined with brick, and painted with broad red and white horizontal bands.
13. 150 feet.
14. 146 feet.
15. 13.9 miles.
16. 16 miles.
17. The whole circle.
18. Fixed white light.
20. From sunset to sunrise.
21. Dioptric.
22. First order.
24. Messrs. Wilkins & Co., 24 Long Acre.
25. By three equidistant ventilators in lantern floor, which admit the cold air from the outside by three equidistant holes under the lantern floor, also by the cowl.
29. About 19,000*l.*; account not yet closed.
31. Dimensions 12 feet diameter. Cost, 1,248*l.* 8s.
35. One lightkeeper at 84*l.* per annum; one ditto at 60*l.* per annum. Rations allowed. See also Query 57.
36. 1,584*l.*
39. Rapeseed.
40. Conyarc wick 9½*d.*, 7½*d.*, and 5½ per yard.
42. Annual vote in Parliament.
57. Same as at the Gun Cay lighthouse.
58. Same as for the Gun Cay lighthouse.

INSTRUCTIONS to the LIGHT-KEEPERS in the BAHAMAS, issued by order of his Excellency CHARLES JOHN BAYLEY, Esq., Governor, &c., &c., &c., 1858.

GENERAL DUTIES.

Time of lighting and trimming Lamps.

1. The lamps shall be kept burning, bright and clear, every night from sunset to sunrise. The wicks shall be trimmed every four hours, or oftener, if necessary.

Regularity and Duration of Watch.

2. The light-keepers shall keep a regular and constant watch in the light-room, throughout the night, and the lightkeeper on duty shall on no pretence whatever during his watch leave the light-room and balcony. The first watch shall begin at sunset, the light-keepers taking the watches alternately, in such a manner that he who has the

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first watch one night shall have the second watch the next night. The length or duration of the watch shall not exceed four hours.

Precautions against Fire.

3. It is imperative that especial care be taken that no lamps, candles, coals, or any other article be left burning anywhere, so as by any possibility to occasion fire. Six fire-buckets shall be kept constantly filled with water in the lightroom, and they shall on no account be used for household purposes. The water shall be frequently changed.

Daily Duty of 1st and 2nd Departments.

4. The daily duty shall be laid out in two departments, and the light-keepers shall change from one department to the other every Saturday night.

First Department.—The light-keeper who has this department shall, immediately after the morning watch, polish or otherwise cleanse the reflectors or refractors till they are brought to a proper state of brilliancy; he shall also thoroughly cleanse the lamps, and carefully dust the chandelier. He shall supply the burners with cotton, the lamps with oil, and have everything connected with the apparatus in a state of readiness for lighting in the evening.

Second Department.—The light-keeper who has this department shall cleanse the glass of the lantern, lamp glasses, copper and brass work, and utensils, the walls, floors, and balcony of the light-room, and the apparatus and machinery therewith connected, together with the tower stairs, passage, doors and windows, from the light-room to the oil cellar.

The First Watch.

5. For the more effectual cleansing of the glass of the lantern and management of the lamps at the time of lighting, both light-keepers shall be upon watch throughout the first hour of the first watch, every night, during which hour they shall jointly perform the duties of the light room.

Measuring Oil.

6. The principal light-keeper shall daily serve out the allowance of oil, and other stores, for the use of the light-room. The oil shall be measured by the assistant in the presence of the principal keeper.

Daily Journal.

7. The principal light-keeper shall keep a daily journal, in journal books provided for the purpose, of the quantity of oil, &c., expended, of the routine of their duty, and of the state of the weather, embodying remarks upon any other occurrences that may arise, which shall be noted at the periods of the day or night when they occur, as they must on no account be trusted to memory. Once a quarter, or oftener if necessary, they shall make up and transmit to the chief officer of the lighthouse department at Nassau, an accurate copy of the journal for the preceding quarter, and all returns shall be carefully examined and signed as correct by both light-keepers.

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Responsibility of Principal Light-keeper.

8. The principal light-keeper shall be held responsible for the safety and good order of the stores, utensils, and apparatus of what kind soever, and for everything being put to its proper use, and kept in its proper place; for care being taken that none of the stores or materials are wasted, but that the strictest economy and the most careful management be observed, yet, so as to maintain in every respect the best possible light; he shall also be held responsible for the regularity of the watches throughout the night, and for the performance of the whole duty of the lightroom, whether performed by him personally or by the assistant.

No Beds, &c. in Lighthouse.

9. No bed, sofa, or any other article on which to recline, shall be permitted in the lighthouse.

Keeping Lighthouse clean and in good order.

10. The light-keepers shall keep the lighthouse, the principal, and the assistant keepers' dwellings clean and in good order. This shall apply not only to the several apartments therein, but to the passage, stairs, roofs, water cisterns, storerooms, workshops, privies, ashpits, offices, court, landing-places, roads and drains, and all other things placed under their charge.

Landing and Examination of Stores.

11. When stores of any kind are to be landed for the use of the lighthouse, the light-keepers shall attend and give their assistance. The principal keeper shall, upon these occasions, satisfy himself, as far as possible, of the quantity and condition of the stores received, which must be duly entered in the store book and return book.

Report and Trial of Stores.

12. The Light-keeper shall report on the quality of the stores, in the Return Book, and this report must proceed upon special trial of the several cans of oil, and the other stores in detail, both at the time of receiving them, and after the experience of a month or two.

Precautionary Measures on Stores becoming short.

13. Should the supply of any of the lighthouse stores at any time appear to the principal keeper to be getting short, he shall immediately intimate the same to the chief officer of the lighthouse department at Nassau, and should he have cause to fear from any untoward circumstances, that a supply may not arrive in time, he shall, with regard to the oil, use his discretion as to lessening the number of burners so as to make it hold out.

[This Regulation objected to by the Board of Trade.]

Erection, &c. of Buildings.

14. The erection of any out-buildings is strictly forbidden, as is also any alteration of the lighthouse premises, or fences, without the sanction of the chief officer of the lighthouse department at Nassau.

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Responsibility of Assistant-keeper when taking place of Principal.

15. Should the principal light-keeper be incapacitated for duty by sickness, or obliged to be absent at any time, the full charge of the lightroom duty and the premises shall devolve upon the assistant, who shall, in that case, have access to the keys of the stores, and be held responsible in all respects as the principal light-keeper.

Prohibition of Trade and keeping Dogs.

16. The light-keepers are prohibited from carrying on any trade or business whatever, and from keeping dogs at the lighthouse establishments.

17. The light-keepers must conduct themselves with civility to strangers by showing the premises at such hour as do not interfere with the proper duties of their office, it being expressly understood that strangers shall not be admitted into the light-room after sunset.

Information required.

18. When any application is made to the light-keepers for information as to shipwrecks in the neighbourhood, or as to the state of the weather, or the management of the lighthouses, they are to direct the applicants to communicate with the chief officer of the lighthouse department at Nassau.

Religious Duties.

19. The principal lightkeeper shall, at least once on every Sunday, assemble his own family, and his assistant and family, in his own dwelling or other convenient place, and there read to them the Church Service for the day, also a sermon or homily from the volume provided by the Lighthouse Board for this purpose.

Neglect of foregoing Rules.

20. The breach of any of the foregoing rules and instructions shall subject the light-keepers to dismissal, or to such other punishment as the nature of the offence may require.

Quitting the Service.

21. The keepers shall forfeit three months' pay if they quit the service without giving three months' notice in writing of such intention to the chief officer of the lighthouse department at Nassau.

Quarterly reading of Instructions.

22. These Instructions are to be read in the lightroom, by the principal lightkeeper to his assistants, once in every three months, and notice of such reading is to be entered in the quarterly returns.

THOS. C. HARVEY, C.E.
Inspector of Lighthouses.

Nassau, N.P.,
November 10, 1853.

CAPE PEMBROKE,
FALKLAND ISLANDS.

3. Governor of the Falkland Islands.

7. For the benefit of vessels bound round Cape Horn, and entering Fort William.

8. 1st December 1855.

9. Messrs. Wilkins of Long Acre contracted with the Admiralty for the erection of this light, including lantern and apparatus.

10. Sea light.

11. Round cast-iron tower, painted in alternate bands of red and white. No lining.

13. 60 feet.

14. 110 feet.

15. 12 miles.

16. 14 miles.

17. Visible over $\frac{3}{4}$ of a circle, viz.:—between the bearings N.W. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ W.

18. Fixed white light.

20. From sunset to sunrise.

21. Catoptric.

22. 15 burners with small reflectors.

24. Messrs. Wilkins, 24, Long Acre.

25. Globe head, top of lantern.

29. About 2,400l. inclusive of lantern and apparatus.

31. Dimensions, 10 feet diameter. Cost included in whole cost of lighthouse.

35. One principal at 150l. per annum, and one assistant at 25l. per ann. with rations.

36. Included in whole cost of lighthouse.

38. 1857, oil 317 galls.; wicks 1884. 1858, oil 368 galls.; wicks 3100.

39. Rapeseed: 1857 4s. per gallon, 1858 3s. 3d. per gallon.

40. Argand wicks 2s. 6d. per gross. Cost 1857 about 1l. 12s.; cost 1858 about 1l. 14s.

42. Annual vote in Parliament.

44. Expenditure in 1858, 315l.

54. Barometer and thermometer.

58. Rules and regulations issued by Colonial authorities.

CAPE RACE,
NEWFOUNDLAND.

3. Board of Works, Newfoundland.
5. 1855.
6. Admiralty.
8. 15th December, 1856.
9. Constructed in England under contract by Messrs. Easton & Amos; engineer, Mr. Alexander Gordon; and erected under the superintendence of a resident engineer sent out from this country.
10. Sea light.
11. Circular iron tower, rising from the centre of the keepers' dwelling, and painted in red and white vertical stripes. Cleaning room, lined with sheet iron.
12. Three radiating copper wire ropes, $\frac{3}{8}$ inch diameter.
13. 50 feet.
14. 180 feet.
15. 15·4 miles.
16. 17 miles.
17. Visible from NE. by E. round by the SE. and south to west.
18. Fixed white light.
20. From sunset to sunrise.
21. Catoptric.
22. 13 burners.
24. Messrs. Deville and Co., Strand.
25. By three equidistant ventilators in the lantern floor, which admit the cold air from the outside by three equidistant holes under the lantern floor, also by the cowl.
29. 5,452*l*.
31. Dimension, 14 feet diameter; cost of lantern and apparatus inclusive 1,906*l*.
35. One principal at 100*l*. per annum; one assistant at 70*l*. Fuel allowed. In the winter months a third keeper is employed.
36. Cost included with lantern.
39. Pale seal, price 3*s*. 1*d*. per gallon.
40. Argand wicks.
42. By a toll in shipping payable to the Board of Trade.
43. Income for 1858, 568*l*.
44. Expenditure for 1858, 600*l*.
45. Barometer and thermometer.
48. Rules and regulations issued by the Colonial authorities.

BREAKSEA ISLAND,
At the Entrance of King
George's Sound, Western
Australia.

3. The Governor, assisted by the Colonial engineer.
5. September 1856.
6. Admiralty.
7. To enable the mail packet of the European and Australian Company to enter the port at night-time.
8. 1st January 1858.
9. Constructed in England under contract by Messrs. Joyce & Co.; engineer, Mr. Alexander Gordon; erected under the superintendence of an officer and working party of the Royal engineers.
10. Sea light.
11. Iron tower, partly lined with sheet iron; tower arises from the centre of the keeper's dwelling.
12. Four conductors of copper wire rope fastened to the lower flange of the tower, and extending to a distance of 20 feet from the tower.
13. 40 feet.
14. 383 feet.
15. 22·5 miles.
16. 25 miles.
17. The whole circle.
18. Fixed white light.
20. From sunset to sunrise.
21. Dioptric.
22. Third order.
24. Wilkins & Co., 24, Long Acre.
25. By globe head, top of lantern.
29. The cost of this lighthouse is included with that of Point King in one account; the whole cost of the two lighthouses has been 3,796*l*.
31. Dimension, 8 feet 6 inches diameter. Cost 231*l*. 10*s*.
35. Two at 68*l*. per annum each.
36. Cost of apparatus 414*l*. 5*s*.
39. Rape seed 1857, 4*s*. per gall.; 1858, 3*s*. 3*d*. per gall.
40. Concentric, 5½*d*. per yard.
42. Annual vote in Parliament.
44. The expenditure in 1858 for this lighthouse and the Point King lighthouse was 345*l*.
54. A barometer and thermometer.
58. The Colonial authorities issue rules and regulations.

POINT KING,
The Northern Bluff of the
narrow entrance to Princess
Royal Harbour, King
George Sound, Western
Australia.

3. The Governor, assisted by the Colonial engineer.
5. September 1856.
6. Admiralty.
7. To enable the mail packet of the European and Australian Company to enter the harbour at night-time.
8. 1st January 1858.
9. Constructed in England under contract by Messrs. Carter & Co.; engineer, Mr. Alexander Gordon; erected under the superintendence of an officer and working party of the Royal engineers.
10. Harbour light.
11. Wooden square tower, with keeper's dwelling attached, and presents the appearance of a cottage.
13. 17 feet.
14. 37 feet.
15. 7 miles.
16. 10 miles.
17. The whole circle.
18. Fixed white light.
20. From sunset to sunrise.
21. Dioptric.
22. Fifth order.
24. Wilkins & Co., 24, Long Acre.
25. Globe head, top of lantern.
29. See Return for Breaksea Island lighthouse.
31. Dimension, 2 feet 6 inches diameter. Cost 53*l*. 5*s*.
35. One at 68*l*. per annum.
36. Cost of apparatus 102*l*. 8*s*.
39. Rape seed; 1857, 4*s*. per gall.; 1858, 3*s*. 3*d*. per gall.
40. Concentric, 5½*d*. per yard.
42. Annual vote in Parliament.
44. See Return for Breaksea Island lighthouse.
54. A barometer and thermometer.
58. The Colonial authorities issue rule and regulations.

CERIGO, ON CAPE
SPATHI, CERIGO,
IONIAN SEA.

3. Maintained under the superintendence of the Ionian Government.
5. March 1856.
6. Admiralty.
7. For lighting the Cervi Channel.
8. 1st March 1857.
9. Engineer, Mr. Walker, Great George Street; and erected under the superintendence of a resident engineer sent out from this country.
10. Sea light.
11. Stone circular tower.
12. Copper rod conductor.
13. 83 feet.
14. 363 feet.
15. 21·9 miles.
16. 24 miles.
17. Visible through an arc of 25° (or from $S. 72^{\circ} W.$ round northerly to $S. 30^{\circ} E.$)
18. Revolving white light.
19. Every half minute.
20. From sunset to sunrise.
21. Catoptric.
22. 21 burners.
24. Messrs. Wilkins, 24, Long Acre.
25. Globe head, top of lantern.
29. 2,989*l.*
31. Cost 1,071*l.* Dimensions 12 feet 6 inches.
36. Cost 826*l.*
40. Argand wicks.
42. Imperial and Ionian. 300*l.* is voted annually in Parliament and paid over to the Ionian Government towards the maintenance of the light.
50. Capt. Spratt, R.N., Her Majesty's Ship "Medina."
58. Rules and negotiations issued by the Ionian Government.

CAPE POINT, CAPE OF
GOOD HOPE.

3. The Governor, assisted by the Colonial engineer.
5. 1853.
6. Admiralty.
7. For the benefit of vessels rounding the cape.
8. 1st May, 1860
9. Constructed in England under contract by Messrs. Joyce and Co.; engineer, Mr. Alexander Gordon; erected under the superintendence of a resident engineer sent out from this country.
10. Sea light.
11. Iron tower, lined with sheet iron, and painted white.
12. Four conductors of copper wire rope fastened to the lower flange of the tower, extending to a distance of about 20 feet from the tower.
13. 30 feet.
14. 816 feet.
15. $32^{\circ} 8'$, miles.
16. 36 miles.
17. All round the compass except between the bearings of a ship of $SSW.$ and $S. \frac{1}{2} E.$, and between $SSE. \frac{1}{2} E.$, and $SSE. \frac{3}{4} E.$, on which latter arc of 7° it will lie obscured by the intervention of a peak rising 64 feet above the light at 1,800 yards from the light tower.
18. Revolving white light.
19. Every minute.
20. From sunset to sunrise.
21. Catoptric.
22. 16 burners.
24. Messrs. Deville & Co., Strand.
25. By 3 equidistant ventilators in lantern floor, which admit the cold air from the outside by 3 equidistant holes under the lantern floor, also by the cowl.
29. About 4,500*l.* Account not yet closed.
31. Dimension, 14 feet diameter. Cost, inclusive of lighting apparatus, 1,995*l.*
36. Included with lantern.
40. Argand wicks.
42. Imperial and Colonial for erection; Colonial for maintenance.
58. Rules and regulations issued by Colonial authorities.

ROMAN ROCKS,
SIMON'S BAY, CAPE OF
GOOD HOPE (building).

3. The Governor, assisted by the Colonial engineer.
6. Admiralty.
7. To take the place of a lightvessel moored off the rocks.
9. Constructed in England under contract by Messrs. Joyce & Co.; engineer, Mr. Alexander Gordon; and erecting under the superintendence of a resident engineer sent out from this country.
10. Harbour light.
11. Iron tower, lined with sheet iron.
18. Revolving.
21. Catoptric.
22. 8 burners.
24. Messrs. Deville & Co., Strand.
25. By 3 equidistant ventilators in lantern floor, which admit the cold air from the outside by 3 equidistant holes under the lantern floor, also by the cowl.
30. Already expended 6,600*l.*, probable cost of completion 1,000*l.*
31. Dimension, 8 ft. 6 in. diameter. Cost, inclusive of lighting apparatus, 1,025*l.*
36. Included with lantern.
40. Argand wicks.
42. Imperial for erection; Colonial for maintenance.

GREAT BASSES, COAST OF CEYLON (building).

GREAT BASSES.

3. Governor of Ceylon.
5. 1848.
6. The Naval Commander-in-Chief on the Ceylon station in 1848.
9. Constructed in England under contract by Messrs. Seaward & Capel; engineer up to Sept. 1858, Mr. A. Gordon; has been building under the superintendence of a resident engineer sent out from this country.
10. Sea light.
11. Iron tower.

24. Messrs. Deville & Co.
30. About 40,000. The difficulties of working on the rock and of landing materials have been found to be so much greater than was anticipated by the engineer that it has been found desirable to suspend the further progress of the works and refer the matter to the Governor for a special report. The probable sum required to complete the works cannot at present be estimated.
31. 1,963*l.*, including apparatus.
36. Included with cost of lantern.
42. Vote in Parliament.

EVIDENCE OF ALEXANDER GORDON, ESQ., C.E. COLONIAL LIGHTHOUSES, &c.

3, Middle Scotland Yard, London,
3d December 1860.

SIR,
On the 20th June last, I had the honor to forward you my answers to certain questions which were sent to me by the Lighthouse Commission.

They were found to have more especial reference to lighthouses in the colonies, and showed that I entertained strong opinions that the course which has been taken "for the construction, maintenance, and control of lighthouses in our colonial possessions, under the superintendence of the Government," at home is not "well adapted for ensuring the most efficient conduct of that service, with due regard to economy."* The Commissioners, therefore, have accorded me this opportunity for communicating my views by separate letter, instead of confining me to their categorical printed initiatory papers.

The original papers sought information on various subjects. (See papers.)

In advancing the following facts and opinions, I shall keep as closely I as can to the spirit and specialities of the printed questions, and take the opportunity for again pressing on Her Majesty's Government and the Public the neglected interests of colonial lights. I have successfully initiated inquiries and changes, and have maintained for many years, that these important structures demand, and should at once have, due attention. Some greater attention has in consequence certainly been given of late; but not yet anything like the due attention.

The figures which I put upon the margin refer to the printed questions bearing the same numbers on each of the four divisions of the inquiry:—

I.—MARINERS' QUESTIONS.

- I. In many cases my remarks apply to the coasts at or near home; but I am more acquainted with the conditions of, and requirements for, lighthouses in the colonies.

I have been for many years, and am, extensively engaged in designing, and constructing and maintaining lighthouses and beacons in the colonies,—in Jamaica, Bermuda, Barbadoes, Turks and Caicos, Bahamas, Newfoundland, Cape of Good Hope, Ceylon, South and West Australia; and I am acquainted with the peculiarities and requirements of coasts at or near home, and elsewhere.

- II. I have been at sea on and off foreign coasts often, and for some days at a time, and have been employed to report upon lighthouses for the different Governments of Denmark, Russia, Spain, Brazil, and Norway; and three of these Governments have adopted my specifications; and my introduction of iron lighthouse towers for some difficult situations has been successfully followed by many countries.

- III., IV. I say that the coasts of the United Kingdom are well lighted. The opinion given by me before Mr. Hume's Committee in the House of Commons in 1845 was, that I considered the English lights then, in a great measure, superior to the French. The use of sperm oil has been discontinued in British lighthouses, and it may be now that a few of our lights

are inferior to the French. Those British lighthouses at home which are supplied with silvered reflectors are, as explained below, capable of being much improved.

- VI. As to my having ever noticed any derangement or irregularity in the light of a lighthouse or floating light; or having ever known lights to go out; or having ever known a floating light to be off her station;—I know of, and have seen, failures of the central and solitary 4-wicked lamp of Fresnel's system. I am well assured that in more than one case it has been put out by a sudden gust of wind causing the lamp to flare, and break the glass; the broken glass has then put out the flames. In a very windy night of the winter 1842–43, I saw this happen at Start Point.

About 16 years ago, when a large English ship from the East Indies was lost not far from Cape Grisez, the few men who escaped from the wreck declared that they only saw a "dim light like a stable lamp, high up."

L'Agulhas catadioptric light at the Cape of Good Hope is complained of as being often very dim, and then can scarcely be made out as a lighthouse. Sir Thomas Maclaurin is one of my authorities as to this lighthouse. Most probably the central light is there neglected, and a smaller light sometimes substituted. The ventilation may not be sufficient for that climate, a common defect in most lighthouses in the colonies. Mr. Alan Stevenson was correct in saying that "the uncertainty of the management of the lamp renders it more difficult to maintain the revolving dioptric light without fear of extinction; an accident which has several times occurred at Corduan and other French lighthouses." The same accident has, I find, occurred at the Isle of Wight. Such were words in my report on Bermuda Lighthouse, 27th January 1843.

I know that in time of hard frost, the attendants upon Fresnel's dioptric and catadioptric system have to stand by and supply oil by hand to the wicks of the central lamps all night, to prevent their going out for want of the regular flow of oil from the cistern. In the colonies lights are often allowed to go out, whatever be the system of illumination. The following are a few instances that have come to my knowledge. I have not had facility for collecting such important facts as I ought to have had.

Fourteen miles S.E. of Monrovia, H.M. steamship "Flamer" was lost on a reef, lat. 6° 10' N., about 250 miles from Sierra Leone, on 29th November 1850, "when steering for the well-known beacon, the Salt Pan Light, which light, as they 'neared it, went out.'" The Morant Point Lighthouse was not lighted at midnight of the 19th and 20th June 1851. In my letter to Lord Auckland, 1847, (Par. Return, 656, of 1850,) I said I had reason to believe that this light at the east end of Jamaica had been often out. The same letter also states that the Bermuda light has been totally obscured at a distance of seven miles.

* The words of the Royal Commission.

The Cape Otway Light, at the western extremity to the Basses Straits, was in the summer of 1854 allowed to be "out for want of oil."

Irregularity in the revolving light at Gun Cay, Bahamas, has been great, as will be seen by the following notes made by Mr. Scott, the resident engineer attending to works in that colony under my directions:—

Date of observation.	No. of revolutions observed in 10 minutes.	Correct number of revolutions in 10 minutes.
October 1, 1857	- 15-00 in 10 minutes	10
" 2, 1857	- 18-46 "	10
Sept. 27, 1857	- 6-66 "	10
March 4, 1859	- 16-10 "	10
" 5, 1859	- 23-00 "	10

There can be little doubt that the same light has occasionally been also out.

The light on Abaco, Bahamas, is very irregular in its revolution.

The light at Elbow Cay, Bahamas, was out on the 19th, 20th, and 21st October, and on the 9th, 19th, and 22d December 1858, and 3d, 4th, 9th, 10th 16th, 17th, 23d, and one other day of February, 1857; in all 14 different nights. Bad ventilation and the wind blowing down put out the lights, with no inconsiderable advantage to those who live by wrecking; that is to say, the greater part of the population of the Bahamas. Upon inquiry it was ascertained that the "cow" had stuck fast, and the keepers would not liberate it. These are samples of lightkeepers.

One night, about three years ago, this lighthouse was in total darkness till 10 or 11 o'clock. The reason assigned by the keepers was the danger of passing from the dwellings to the tower in a storm. During that time a vessel was wrecked on a cay four or five miles off a loss which no doubt occurred through want of the light. All hands perished. It happened on the following morning that the lightkeepers were occupied enriching themselves from the wreck. Wreckers are a dangerous class of men. There is reason to fear that most of the inhabitants of the Bahamas have, more or less, pecuniary interest in the "wrecking trade." When wreckers have taken all they can from a ship which they cannot get off, they burn her to the water's edge, so that she may be no beacon to warn other ships. Such being their practice, the legislature might perhaps enact that abandoned wrecks, hard and fast aground, are to be respected as beacons.

I have lately received thanks from the Board of Trade for calling the attention of their Lordships to an award in the Admiralty Court at Nassau in favour of the Board of Trade (who own the lighthouse yacht) for their share of a wrecking speculation; and during this year the captain or master of the same lighthouse yacht has brought in an abandoned ship, by which he expected to make a thousand dollars. The interest of the wrecking trade pervades even the administration of the local government, and if the lighthouse attendants be not well watched, which they are not, the lights may be used as decoys. I believe they are so used.

The Turks and Caicos were troubled by wreckers, some of whom were from the Bahamas.

My lighthouse on Grand Turk, being well attended to, caused many of the wrecking fraternity to turn to salt making and other honest callings.

Wreckers were numerous at Bermuda before my lighthouse was put up there; since its establishment and good maintenance the wreckers have been compelled to change their occupation. They now are engaged principally in cultivating oranges.

In my letter of date 15th June 1859, addressed to this Royal Commission, I said that "before I built the Turk's Island Lighthouse I had strongly recommended to Government notice the neglected condition of the adjoining lights in the Bahamas;" and I submitted a wreck chart of some ships lost, &c., all within the time to which I have just referred. In number the wrecks exceeded 400 during that time, and the proportion has even been greater of late.* During the year ending the 26th June 1860, that is to say, during only the twelve months since I wrote to

you, the losses have been 38 ships, the value of which, with their cargoes, has been more than \$1,500,000. Add to this amount what the underwriters refuse to pay,—nearly as much,—and remember that the loss of life must have been very great.

Of the certainty of floating lights I can say little. They are often very dim, and in rough weather are so unsteady and irregularly intermittent that they are ill discerned, and also likely to be out; or they may have been lowered into the deck houses for trimming (an evil which could be avoided by a modification of the manner proposed and described by me in my evidence before Mr. Hume's Committee, answers 4458-4464, accompanied by a plate).

The floating light at Berbee broke adrift in March 1848, and for four months after she was "waiting repairs," and for want of funds "she was going to ruin."

VII. As to what British and what foreign lights I have usually seen furthest off, and which of the two has been usually visible at the greatest distance, I have seen the beams of the French light on Cape Griznez from the top of the East Cliff at Hastings, a distance of about 40 miles. Beachy Head Light I consider equally effective, though I never was on a sufficient height to see it from a distance. The beams of the Fresnel system on my Bermuda Lighthouse are seen about 40 miles off. I have seen the Dunkirk Light from the South Foreland which is as great a distance. Certain conditions of the atmosphere may occasionally show all these lights even further off. At high water I have seen from Boulogne both the oil lights on the South Foreland (the distance, say, 27 miles). The upper one is Fresnel's fixed, the lower one is of Huddart's reflectors fixed. They were both about equally bright, both illuminated (then) with the same oil, and the areas of the two luminous bodies looked at then were about the same size.

VIII. The navigation of the Solway Frith early engaged my attention. Persons much interested in its ports consulted me as to the erection and maintenance of a lighthouse on Heston Island. The lighting and buoying of the Scotch side of that frith have been subjects of discussion for more than fifty years.

The opinions of Captain Washington, R.N., now the hydrographer, Captain Robinson, R.N., Captain Moorsom, C.E., Captain Conning, and many other sea-going men in the merchant service, induced the presentation to the Commissioners of Northern Lights in 1847 of five petitions for a light at Heston Island.

The petitions were signed by the united agricultural, commercial, and shipping interests of the Scotch side, as well as by the trading interests of the English side of the Solway, and also of Liverpool, Belfast, and Carrickfergus ship owners.

There were also affixed the signatures, it may be truly said, of the whole county of Kirkcubright; yet the combined recommendations of these, the most experienced officers in each service, and the remonstrances of the parties best qualified to estimate the evil, and from personal experience most desirous to avert it, were quietly ignored by the "board," which turned out to be only a lawyer and an engineer.

On the 16th of November 1848 a renewed application was made, in which the memorialists entreated the Commissioners of Northern Lights to "grant their prayer." It was not granted, and I succeeded in having ordered by the House of Commons returns of the several applications made to the Commissioners of Northern Lights since the passing of the Act 6 & 7 Will. IV. c. 79, for grants in aid of existing lighthouses; for grants for new lighthouses; and for new grants for buoys and beacons. A Return was made, but not the Return; and the Secretary to the Commissioners has since admitted publicly that "the application to the board to erect a lighthouse on Heston, and many others of a similar nature, are not to be found in the Returns, as the Commissioners gave 'no return of the several applications for grants for 'new lighthouses.' They interpolated the words 'in aid of' just before the words 'new lighthouses,' and thus avoided the exposure.

The Hanoi Rock at Guernsey should be lighted, and there remains now no real difficulty. It is more than nine years since I commenced, in conjunction with the late Mr. Joseph Hume, to open up this matter. The Far. Returns 560 of 1850 and 302 of 1853 were moved for by Mr. Hume, at my request. They show the loss of life and property which had taken place, commencing in 1805 (when more than 150 lives were lost by the

* In June 1860, the number of ships known to have been lost amounted to about 500 in 11 years.

wreck of a British ship of war), and how cheaply a light can be erected and maintained at Guernsey, Keith's Reef, in the Skerki Channel, (Mediterranean.) is a position where a light is very necessary, to prevent ships making a long detour. The work may reasonably be done by the aid of contributions from other nations. My views on this subject were, at the request of Admiral Beaufort, submitted to the Admiralty pretty fully about 10 years ago. The Par. Return No. 656 of 1850, Mr. Hume moved for at my request, with the concurrence of the late hydrographer, Admiral Sir Francis Beaufort, and Captain Washington, R.N., his successor in that department. That Return shows a long list of lighthouses which are much required, and to that long list may be added the Pratas Shoal in the Fomrosa Channel, the Pulicat Shoal, north of Madras, Virgin Gorda, or its neighbourhood, in the West Indies.

It is more than 12½ years since I urged the necessity of a lighthouse on Great Isaacs, and since I laid the matter before the Earl of Auckland, then First Lord of the Admiralty. During that time 25 ships have been wrecked upon that one island alone. 24 of these and many of the other vessels wrecked during the same time in the Bahamas, in all, about 500, might have been prevented, and very many lives saved, by more prompt attention and systematized action.

The Memory Rock is one of the important positions for a lighthouse. By Par. Return No. 656 (of 1850) it will appear how early I attended to it. The rocks have been surveyed by Captain Barnett, R.N., and have now been carefully examined by Mr. C. W. Scott, who has just completed and lighted my Lobos Cay lighthouse. It is likely that the Memory Rock cannot be depended on for foundation, but Sandy Cay, about nine miles to the southward, has been surveyed, and will answer if the tower be light and well founded.

I have now the surveys of the numerous sites for Lights proposed by me for the Bahamas 11 years ago. These sites require more than the makeshift engineering and promised cheap work of the colony.

A lighthouse is much required at Coningbeg, the southernmost of the Saltee Islands (Ireland), and it could be easily erected.

XIX. Fairway floating lights would be of the utmost value to vessels running up and down the British, the St. George's, and other channels. Then ships might safely run for the lights in succession, instead of running along the coast to look for the lights which are upon dangers. It is in the neighbourhood of lighthouses that wrecks do most abound, as may be seen by reference to the wreck charts. Mr. George Herbert's system promises success for the establishment of "Fairway Lights," if they have low wrought-iron towers. That would be by enlarging, manning, and illuminating bodies, of which his extensively used buoys are types.

XX. Extreme height of lighthouses is to be avoided, whatever be the optical arrangement, because the light may be obscured by fog when all is clear below. The height of the old Needles Light occasioned many losses.

The objection to great altitude is much stronger in the case of a dioptric light, the vertical divergence being so small that the lower part reaches the sea too far from the danger. A French light of the 1st order would in such a situation leave a dark space extending 3,200 feet from the cliff seaward. Upon the divergence and upon the height of the light depends the dark space close in shore, where a ship may have arrived during snow or rain, and then cannot find the light again even when the atmosphere has cleared.

The deep water under Cape la Héve, near Havre, (where the lights are 397 feet above the sea,) is such a position. With vessels of small draught of water this may happen at South Foreland (372 feet high).

My lighthouse just completed upon South Point, Cape of Good Hope, is on a precipitous perpendicular rock, 800 feet above the sea, but it is illuminated with paraboloidal reflectors, with a great divergence downwards, and also the naked radiating light, as well as part of the reflected light, may be seen close in shore. It is however well worthy of consideration whether the dangers known as the "Bellows" and the "Anvil" could be avoided by throwing them, and all between them and the Cape, into darkness. This could easily and economically be done in such directions, by placing within each of the reflectors a pressed lense of thin crystal, which would gather up all the rays

of light which at present escape by simple radiation. The projected beams of light would be much improved in intensity by this slight addition.

Lofty towers are more costly and require more labour from the attendants*, and though they afford some advantage to the ship looking for a fresh departure, that is given at an increased cost, and with danger to the vessels which run to sight the light.

I would prefer never to have any artificial altitude greater than 100 feet; but a lighthouse on undulating land may have to show over some intervening height or outlying danger, and this last is a case where, by calculating the first cost and annual maintenance for one lofty light and for two of inferior height, a good decision may be arrived at, having regard to whether the fogs be high or low.

Dependance upon the extreme range of any light for the avoidance of a danger near the horizon illuminated (which distant illumination be it observed is only in favourable weather) is hazardous. For instance, the Madras Lighthouse is often anxiously looked for to keep clear of the Pulicat Shoal, and it has repeatedly happened that when a ship has struck on the Pulicat (and not till then) the Madras Light has been made out "too late." A ship might be on Diamond Point, at the entrance to the Old Bahama Channel, before seeing (if she trusted to making it out on that bearing) Lobos Cay Light, which I have just completed.

The new catadioptric light (420 feet high) on Pencarrow Head in New Zealand is another instance of a catadioptric light being placed too high. That position is subject to earthquakes. It is but lately that the whole of Wellington Harbour was upheaved more than two feet. A similar earthquake may destroy the perpendicularity of Pencarrow Lighthouse, and throw the plane of its light much above the eyes of all seamen. Such accidental elevation on the seaward side of the plane of light would prevent it being visible at all from that, the required direction.

XXI. and XXII. Shape is a safer mode of identification than colour. I wish to avoid colour, more especially since the discovery of "colour blindness" by the lately deceased Dr. George Wilson. The contrast between high peaked lantern roofs and flat roofs is great. Conoidal towers contrast with cylindrical ones. We can have polygon shapes. When iron is used for the material of the tower a variety of forms may be had in the outline of the towers and in the form of their tops.

The light on Cape Race, Newfoundland, should have been made a revolving one, and that at Cape Pine should have been a fixed one. The change could easily be made now, because both lanterns are alike, and the details of the reflectors, lamps, and all parts are conformed to standards. The revolving machine and revolving frame at Cape Pine will do for Cape Race, and the fixed frame of Cape Race will answer for Cape Pine. If this change be not made, the Cape Race ought at once to have more illumination. The increase of light can be given for a small outlay, and would not require any greater annual expenditure for oil and attendance. Since I had these lighthouses made, we have obtained an excellent system for utilizing a good deal of light which is now wasted, the original cost for which is very small.

The light of a lightship need not be more than about 15 feet above the deck, say 20 feet above the sea. That would give an uninterrupted line of tangential light for about nine miles, when we take the observer's eye at only 10 feet above the sea.

In my evidence before Mr. Hume's Committee (House of Commons in 1845) I suggested that in "respect to floating lights, instead of masts upon which the lanterns are now raised and lowered, "cylinders of wrought iron should be used, through which the lamp trimmers could ascend to the lamps and reflectors in all weathers. A cylinder of 3 feet 6 inches diameter would allow of a light equal to the "Ostend Light, and with 4 feet 6 inches, a very efficient set of reflectors might be introduced. The "funnel would terminate in the lantern, which could, "if required, be lowered or raised within the cylinder, "but should remain up during the night." The door of entrance should be under the deck.

In the Great Isaac's Lighthouse in the Bahamas, which was completed under my direction, but for the lantern and optical arrangement of which I am not

* Which they often avoid for masts.

responsible, the amount and intensity of the light might be doubled by a small change. There are 21 silvered reflectors (see Figs. 4 and 5, plate 2), with one lamp in each focus, which really give from their three faces of seven in each face less light than three lamps in each face could be made to give (by Fig. 3, Plate 2). The change would save 14 pints of oil per night, or 640 gallons annually, and the lantern would be kept cooler at night.* I regret the feeble power of the present beams, and denounce the employment of second-hand reflectors, or such as had been removed and superseded in England: Such courses are often taken with the colonies.

There are the Gozo Lighthouse, the Cerigo Light, and very many other such cases of unnecessary double consumption of oil or of interior light.

The lighthouse on Cape Pembroke in the Falkland Islands is a striking case in point; and as it has been quoted to me as a remarkably "cheap light!" I take leave to be somewhat particular in reference to it. The Admiralty had decided on the position, height, and character of the light. They required, 1st, light tower to be 60 feet from base to top of the lantern, with requisite foundations; 2nd, light fixed, and of the same description as that used by the Trinity House to illuminate $\frac{5}{8}$ of the horizon.

Instead of the lights being of the same description as those used by the Trinity Board to illuminate $\frac{5}{8}$ of the horizon, the Parliamentary Returns for which I persuaded Mr. Hume to move, says the 15 reflectors are 12 inches diameter. Now 16 would have been a better number for illuminating $\frac{5}{8}$ of the horizon, and the reflectors, instead of being only 12 inches in diameter (as are those of mere harbour lights), ought to have been 21 inches diameter, in order to comply with the condition, "as used by the Trinity Board" for great sea lights.

A seaman making out the light from Cape Pembroke can have only one reflector in sight (or its equivalent), and he will have a light in size and value to look for not $\frac{1}{3}$ of that intended by the reference to those "used by the Trinity Board," and only about $\frac{1}{2}$ of the light which had then for some years been obtained for combustion of the same quantity of oil.

200l. may be taken as the annual cost of oil at Cape Pembroke, and the effective value of the light so produced is only the $\frac{1}{2}$ part of what it ought to be, as an inspection of Figs. 6 and 7, Plate 2, will show, and a comparison of those with the other figures will at once show the deception, the insufficiency, and the waste continuing of money.

XXIV. and XXV. In practice, white, red, and green lights only are used.

XXVI. Red is more to be trusted as a paint for lighthouses or for lightships than any other colour. The red funnel of a steamboat is visible at a greater distance than black or white painted funnels. A chequered pattern of red and white, or red and white stripes alternating in vertical or oblique lines, afford distinctions. In board I would paint the bulwarks, deck, and deckhouses of lightships white. Some of the lighthouses upon which I have been employed are painted in broad vertical stripes of red and white alternating. Others of them are painted with horizontal stripes. The top rail of lightships should be covered with sheets of brass, kept bright.

XXXI. The dangers of the Great Basses and Little Basses, south-east of Ceylon, should be averted by a lighthouse placed upon one or both of these dangers. I have been employed for a light upon the greater of these; but having been overruled by a multiplicity of directing influences, the whole of that work has in consequence been suspended, if not abandoned, after the expenditure of a large sum of money.

The steamboat which Her Majesty's Government allowed for this work upon a difficult rock, 10 miles from the main island, occupied 312 days in making her passage from England; arrived out of condition, and was such a vessel as required repairs every few days. In fact, she was only able to give our working party 66½ hours (in all) upon the rock during 292 days; and, indeed, she was only 16 days of any use at the rock. A flagstaff was erected, which has stood well ever since; and if my submissions had been adopted, the lighthouse would have been well advanced at this time. It would be well if this matter were rigidly inquired into.

XXXII. The polyzonal arrangement of the dioptric and catadioptric systems was practically introduced by me in the year 1833, that is to say, three years before the Trinity Corporation erected one.* I think that there are positions where the catoptric system is decidedly preferable (of course it is known that at each situation there may be peculiarities which require to be specially provided for) to the dioptric and catadioptric.

In my Report to the Board of Trade of the lighting of Lobos Cay Lighthouse (on an island of sand), Bahamas, dated 7th March 1857, which has a first order of Fresnel (fixed), will be found the following words, and refers especially to lighthouses in remote colonies, and having in view the untrustworthy light-keepers:—"I have put up many catadioptric lights, but I prefer for this remote locality the more simple arrangement of the catoptric (of deep reflectors), the superior value of which latter, when compared with shallow reflectors, is fully before the Board of Trade (in my letter to their Secretary, of date 6th February 1857). There is also reason to suppose that such catoptric light is equal to any catadioptric light; moreover, it is more economical, and more easily attended or repaired, and with its many lamps is more certain of being always alight than the system which is dependent on one central light. Again, Lobos is in a locality where hurricanes and earthquakes may disturb the perpendicularity of the tower, and perhaps occasion settlements of the foundation, and leaving the tower so inclined, that the thin plane of light, however bright, may be on one hearing altogether above the seaman's eye, at all distances, and consequently on the opposite bearing inclined to the sea so much that it could not be seen even so far as Diamond Point. The last is the grand objection. All catadioptrics require greater altitude of glass, and of themselves are much heavier than the simple reflecting system. The greater weight and surface at such a height will, during storm, cause greater oscillation, and, consequently, greater strain. The simple arrangement of the best reflectors, whether for a fixed or for a revolving light, sets us free from the difficulties just referred to."

SCIENTIFIC QUESTIONS.

Optics.

II., III. Oil used to the best advantage is the cheapest and safest source of light. It may be relied on for constancy. Rain, snow, or fog will occasionally totally eclipse it, as they do the sun and moon.

As some steamboats run a mile in three minutes, it is to be remembered that, on a stormy night, gas may be jerked out, and no light exhibited for many minutes afterwards. An oil lamp is simple, complete in itself, and reliable as a self-regulating "small gas making apparatus." It is subject to no explosion, and may always be in condition.

In the year 1833, I introduced practically, as stated above, into Britain, for lighthouse purposes, the catadioptric apparatus of Fresnel; † and in its focus I burnt rape oil, then not used in English lighthouses. I exhibited the same at the Trinity House, and left the apparatus there for many days. In the same year I burnt gas in the focus of these catadioptric lenses at the Town Pier at Gravesend. I also used in the focus of the same catadioptric apparatus for many weeks (in 1834) the continuous oxyhydrogen lime light on the top of the Coliseum. It burnt steadily without flickering. Drummond had found that the vapour from flame of spirits of wine was more convenient and as good as that from hydrogen gas for obtaining his lime light for trigonometrical surveying; and I am, I think, prepared with an arrangement of lime, with a continued play of oxygen through the flame of an oil lamp upon it. The danger of hydrogen gas or spirits of wine will thus be avoided, and even if the oxygen or lime should by accident be out of order, the oil-flame will be still alight and effective.

Magneto-electric light may be had at an expense of about twice or three times the cost of oil light. Its accurate permanent exhibition depends, however, upon the condition and action of a steam engine, and

* The whole set of 21 burners were burnt out in less than six months time. Such common iron burners should never again be allowed in any remote lighthouse.

† Mr. Herbolt's Evidence, 4724-26 in 1845.

‡ And I exhibited it at a meeting of the British Association at Edinburgh in 1834. See Plate 1.

the attention of the driver. For motive power, the rise and fall of tide may be substituted and availed of, and also in some floating lights, but in these last the run of the tide or current may impel the machine, and the pitching and rolling may be made to add or store power. Great objections to magneto-electric lights afloat are the weight and motion of the apparatus in such very uneasy positions.

I do not think there is much practical difference in the power of illumination of lighthouses when, in ordinary weather, we compare lights of the same sized area of luminous body in the respective lanterns, supposing one to be the best dioptric and the other the best catoptric. The largeness of the luminous object is of considerable consequence when looked for from a distance in ordinary weather.* The intensity of light from a smaller luminous object is of more consequence in hazy weather; but at a very small distance, fog, rain, or snow obscure any and all lights, not excepting that of the sun; and in such conditions of the atmosphere any light obtained from electricity would be of no more effective.

Utilization of Light.

- IV. The glass lenses are now either of thick plate glass, cast and cut, or they are made under Degrand's Patent of thin crystal pressed (not "cast") in metal moulds, which metal moulds are cut for dioptric, catadioptric, and catoptric purposes, after Fresnel's formula. The crystal moulded lenses of Degrand are much to be preferred; they are cheaper and more economically maintained. They are thinner, and destroy less light than those of plate glass that have been cast and cut. The former are in my experience the best apparatus for most situations, though there are many situations where reflection from polished silver surfaces is preferable. I give a view of the best form of silvered reflector. Plate 2, Figs. 1 and 2, and Fig. 3 has the addition of a small Degrand glass refractor. This Fig. 3 is the complement of my patent system (in the year 1834).
- V. Apart from the chemistry of the question, as to the best optical arrangement, and looking at this as an inquiry in physiology, the combinations of dioptric, catadioptric, and catoptric glass, by Degrand's system, will be (except in a few climates and atmospheres) to be the best for continuous and simultaneous observation from all parts of the horizon illuminated. Recurring occultations, if needed, could be occasioned by screens, and would be simultaneously observed. I prefer well-timed recurring obscurity to any changes of colour, about 6 per cent. of mankind being colour blind, and incapable of distinguishing the available colours.
- VII. All reflectors, whether made of glass or of silvered surfaces, should be made very deep, of long axis, so as to divert as many of the spherically diverging rays into the required directions (whether in fans or in beams) as can be conveniently appropriated. The calculated areas (we may call them the comparative numbers of repetitions of the focal light) are marked on the respective figures upon Plate 2, and the faint concentric circles and parallel lines drawn upon each figure express the increasing value of the oblique incidence of rays of light touching the paraboloid at its remoter inner edges. As these fanciful faint lines appear to get nearer to each other, they show how the penetrating power of the light is increased. The paraboloidal curves may of course be projected yet further from the vertex of that diameter which passes through the focus. An inspection of Plate 2 will now suffice to show that much light may be saved by what Professor Faraday has called the "Gordon reflector." More than double the amount of light may be had from the same consumption of oil, and by the same or less cost of attendance; or an equal amount, and greater intensity of light, may be had from the consumption of only one half the quantity of oil now used in those lighthouses.
- When glass is used for reflectors or for refractors, the manufacture should be of the best flint glass, pressed into form by steel moulds accurately cut.
- VIII, IX, X. A white light is preferable. Either one of any two lights, if 50 miles apart, ought never to be mistaken. If the lighthouses be necessarily at a less distance, I would prefer to have the distinctive character of different sea lighthouses known by the number of lights, or number and succession of appearances. When more than one light is to be the distinction, the lights should be placed one above the other.

If 60 feet apart on a vertical line, the two lights may be made out at a distance of 10 miles. We can have lights visible once a minute or twice a minute, or more; we can have scintillating lights, or occultations by screens. Any owner of a watch with a chronometer beat at his ear could recognize the light. The time may also be shown by a very simple spring metronome.

I have never used coloured media when such could be avoided. A white great sea light often appears to be red after the observer had been examining the fires in a ship's engine room; also when taking the bearing of a distant lighthouse from a powerfully lighted binnacle. Fog makes a white light appear red.

- XI. *a, b.* Whether the height of the lantern above water be known or unknown, the distance may be ascertained pretty nearly if there be two or more lights placed apart on the same vertical line in the same lighthouse tower. Intervals of six feet may be adopted for each nautical mile. Then two lights placed vertically and 60 feet apart may be made out at 10 nautical miles distant, and so on. Such a lighthouse and another lighthouse distinguished by two vertical lights only 30 feet apart need not be mistaken.

Mechanics.

- XII. The construction of lighthouses in exposed situations may be considerably improved. I have long laboured to get a lighthouse erected on the only rock "awash" in the Skerki Channel in the Mediterranean, and my views for the use of a foundation of lead on that rock were published in the Nautical Magazine, dated May, 1851, and other publications. There are also several positions for which I have recommended the use of gun metal.

Timber is too little employed, but it ought in all cases to be made unflammable by Mr. Maugham's patent process. Ruydard's timber lighthouse (1708) upon the Eddystone Rock might have been standing to this day had it not been burnt down after 47 years of successful duty. I never heard of any concussion having endangered it.

I prefer fixed beacons being made of iron, as gun metal and lead would offer temptations to theft. The iron beacons should be made in such manner that they can be repaired piece meal, or entirely; and they should be close work, and not on open frames. I have lately heard of the loss of the Hogstye Stone beacon in the Bahamas; it was built of the inferior material of the colony, and in a very rude manner. Had it been constructed of iron it would have been safe.

- XIII. I have some new mechanical arrangements for lighthouses and floating lights, and some other improvements in lights in floating bodies, which I am not yet prepared to make public. All lamps for colonial lights should be made of brass, and the burners tipped with platinum. Then these burners will last for 20 years, and not be burnt out, as iron ones are, very often, within six months.

Flotation.

- XIV. For floating lights the most steady hull would be Mr. G. Herbert's Patent Circular Buoy, moored by the centre of gravity.

I should prefer for such floating lights as are exhibited from manageable sea boats that the hulls should be of greater beam in proportion than any I have seen afloat. Provision for elevating the light, and for the men's attendance in all weathers upon the same, should be had by a light hollow-wrought iron shaft, as a chimney extending down to the lower or platform deck.

A lightsip constructed of iron may be so strongly made, and strengthened by large shelf pieces and deep strong walings, that her moorings could never damage her in any weather.

Buoyage.

- XVI. For mere buoys which have no crew on board, Mr. Herbert's system is admirable for buoying channels or rocks. For lakes, rivers, or estuaries, liable to be frozen over, there is no shape of buoy equal to that introduced by Mr. Atherton, of Woolwich Dockyard, when he buoyed Lake St. Peter's a few years ago. This buoy was a long frustrum of an elongated iron cone; the lower and larger diameter had a hemispherical bottom, from which it was moored; the lower portions were very much loaded, so as to bring the centre of gravity much below the surface of the lake. The smaller portion which is not submerged stands erect, and when the river is frozen up the action of the sun

* See Mr. Faraday's Report to the Trinity House, 11th November 1857.

keeps the buoy free, and if the ice be drifting the buoy escapes downwards, and is not carried away.

Luminous buoys for night are difficult to be had. Thirty years ago I assisted my father in some experiments with a view to illuminating the Swin by a mixture of pyroligneous ether and a small quantity of essential oil. The only wick used was our then patent capillary wire wick, or capillary spun glass wick, both of which are well known in the tea urn maker's trade as the "Gordon Lamp and Kettle." We had one of these lamps burning without interruption day and night, and without attendance, for six weeks.

In lakes and rivers where a boat could attend daily upon the buoys, the buoys might be illuminated by a "wheel lock" in each, acting upon iron pyrites. The coal miner's pyrites lamp of olden times might be made serviceable. A dull light may also be had where electric wires can be securely laid down.

Acoustics.

XVIII., XIX. That sound or noise will be most distinctly heard which does not accord with the sounds prevailing on board ship or on rocky or other precipitous cliffs. Shrill sounds travel farthest. The penetrating peculiar sound made by the common house cricket when he grinds the basis of his wing cases against each other travels far, and I am of opinion that we might well take him for a prototype. We can rub together the edges of two shrill sounding large howls revolving eccentrically. With one then grinding out G natural and the other G sharp, we can obtain a valuable discord.

In my evidence before the Committee of the House of Commons, 1845. (Mr. Hume's Committee,) I suggested that in foggy weather the gong or bell should be superseded by a screamer or whistle, similar to the railway whistle, giving its sound by bellows, the sound being directed round the horizon by reflectors, either in revolving currents or streams, or by a centrifugal plane of sound.

A large stentorian screamer after the model of a railway whistle could be heard much farther than a gong, for a shrill sound can be heard to a greater distance than a low one. Any elastic fluid forced through the screamer will do, but the aeriform fluid of the greatest weight is to be preferred. The Americans published my views on this matter many years ago, and gave me credit for the invention. Now, as notified to mariners, there is on Partridge Island (Bay of Fundy) a steam whistle sounded "once a minute," which has "been heard from a position eight miles to windward," and has "proved the efficiency and utility of this addition."

As for fog signals in floating lightvessels, the rolling and pitching, and even the sleepy undulations of the sea in the calmest weather, may be availed of for gathering force of wind, or of machinery for a great and distinct articulate noise.

The most quiet movement of the lightship (or buoy) can be easily converted into power, accumulated, stored, and used for sounding a bell, a stentorian screamer, or bars of bent metal fixed, and suspended by their nodes.

A bell cannot be well heard and ascertained. No steamer going fast would derive any benefit from an 18-pounder gun fired at the intervals now used.

Now, considering the distance at which it may or may not be heard, say three miles, or less, (according to the wind,) a fast steamer must lay too, and any vessel must run the risk of a current carrying her into danger before the signal can be heard even in favourable weather.

In Nova Scotia horns are heard two and three miles off, but the blowing of them should no longer be done by men's lungs, but by artificial blasts, mechanical or chemical, and in all cases the vibration of sound should be reflected into the required direction, not lost landward or heavenward. Carbonic acid gas will by reason of its great specific gravity be heard at the greatest distance.

When reporting to the Board of Trade upon a fog signal for Cape Race, where there are no artillerymen, I said (30th July 1857) "Pyrotechnists can imitate closely the effect of 18 lb. pieces of ordnance as regards sound. I think their encasements of gun-powder by paper are called maroons. A stock of such articles, prepared with all but the detonating cap, might be conveniently and safely stowed in a dry magazine, apart from a lighthouse, and brought out and discharged as time might require. I would gladly hold a conference with the Civil Engineers of the Home Lighthouse Boards upon the subject of

"fog signals; and I venture to submit to my Lords that great good might be derived by obtaining the opinion of Captain Boxer, R.A., of Woolwich, and also of some well-known practical pyrotechnist."

The matter then suggested was proceeded with without my being made aware of the course adopted, and no notice was taken of the other suggestions in that letter.

After my proposition for using fog signals was given in to the committee of the House of Commons in 1845, the Trinity Corporation tried a small size pair of bellows, which, worked by hand, blew air through a small railway whistle. If I had been consulted they should have been advised that their scale of arrangement (or rather that of Mr. Wells) could not succeed.

About 18 months ago I witnessed the experiments of Mons. Degrand, of the French lighthouse establishment. That gentleman built of bricks and cement a deep paraboloidal reflector about 10 feet in diameter upon the high ground on the north of the Quai de Billy, in Paris, and sounded a 13-inch bell in the focus of the reflector. By this a very great effect was produced at the farthest part of the Champ de Mars. Many years ago, in Holland, I met with an instance of reflected sounds being thrown from a remote turret clock down upon the town below. I think it was Helvoetsluis.

XX. In my evidence (1845) I submitted a set of paraboloids revolving round the focal sound. That revolving arrangement produces a greater effect than a Bordier Marcet flame reflector could do, the power of the sound being confined to a beam instead of being spread out on the horizon. Moreover, it gives us an opportunity for striking one note in a given time from the N., two notes from the S. in a like lapse of time, three notes from the E., and four notes from the W., by which the seamen may know the bearing of the danger.

XXI. Sound travels furthest when low down, and near smooth water, but it is necessary to keep such a height as will clear the tops of all waves.

MANUFACTURERS' QUESTIONS.

- I. and II. It is not necessary that manufacturers of the optical apparatus should be informed either of the height of the light above the sea or of the precise horizontal arc to be illuminated. The civil engineer should specify these, and insist on his specification.
- II. It is no more necessary or important to the efficiency of the lighting apparatus that information should be furnished to the manufacturer (as to the height of the light or the arc to be illuminated) before the lenses, prisms, &c. are made and ground, and before they are finally adjusted in their metal frames, and before their ultimate position with reference to the lamp is decided on, than for a compounder of medicines to examine the diagnosis of a sick man before mixing the drugs ordered by the physician.
- III. As to the proposal to prepare a table from which the angles required for constructing an apparatus to illuminate a given horizontal arc, and to be placed at a given elevation, could be regularly calculated by the manufacturer from data furnished by the person giving the order, I consider that a table or set of tables might be read in error, and mischief might follow. The person or the board giving an order should be guided by a civil engineer of sufficient mathematical and practical knowledge and foresight.

The following answers relate to the printed forms sent to the authorities having charge of lights.

- I. The number of our colonial lights exceeds 200, and with very few exceptions they are ill-managed and neglected. "Superintending authority" is alarmingly wanting (even in situations where the home government maintains the lights). The cost of illumination is unnecessarily heavy. The supply of water very precarious. Distillation from sea water unavailed of. Lightkeepers are appointed and retained who are totally unfit for the work. Some years ago I found an instance of a principal lightkeeper being appointed at a high salary, in order that he might pay off his debts to his patron who appointed him. I once met with a case where the head lightkeeper had not been in the lantern for seven months. Lately I learned that at Cay Sal another lighthouse keeper had not been in the tower for several months. I pause here to ask how can such and other evils narrated be prevented if the inspector of lights has to fulfil the duties of out-island engineer, surveyor-general, member of coun-

cil, member of house of assembly, canvassing for which last the lighthouse yacht was lately employed? No gentleman can do well all the duties required, in my opinion.

The Commissioners would do well to obtain a copy of the correspondence in Nassau between Mr. Harvey and Mr. Goldie.

If one of the two commissariat officers at Nassau should be unable for duty, or if war broke out, all the Bahama lights would be entirely neglected. There is no doubt of this.

New revolving machines have for many months been required for Abaco and Gun Cay, and the new light on Great Isaacs already requires another machine. Who is attending to these?

I could go on and narrate other very bad cases. No systematic administration has yet been fixed for preventing the numerous evils already mentioned, and very many more with which I need not burthen this letter.

I was the first to suggest, and press earnestly upon the attention of Her Majesty's Government, that a department should be established at home for the erection and maintenance of colonial lights with expedition and economy, and with advantage and satisfaction to the Shipping interest, and with a great saving of public money, which now is really thrown away; and I have again and again insisted upon the necessity of establishing a small central board or commission at home, having in view a centre for current information, advice, and repairs; a selection of lightkeepers from old and deserving warrant officers and seamen; devising financial arrangements which would be necessary; and for having every colonial light regularly and repeatedly inspected by competent naval officers in command on the respective stations. The above are almost the very words which I used in my letter to the late Sir Robert Peel in August 1847, and nearly the same in my letter to Lord Auckland. (Par. Report 656, 1850.)

VII. The mechanical variations I have already referred to; but here I would remark upon what is called "the orders of lighthouses." Though the term "order of light" is not quite out of place in the catadioptric and dioptric system of Fresnel, it is open to objection. The "orders" of Fresnel have been changed twice already. When such terms are used in regard to catoptric light, great confusion arises. Cape Race Fixed Light may be called in Trinity House terms of the "1st order," and yet the South Foreland Lower Light (fixed) has not one half the power of illumination; and as to Falkland Island Light, which is published as of the "1st order," it is absurdly so named; it was a case of gross imposition. It will be seen by Plate 2, Figs. 6 and 7, that the reflections of the lamp flame on the seaman's eye at Cape Pembroke are only 154.45 square inches. Those at the Lower South Foreland (see Figs. 4 and 5) are 518.59 square inches. Those at Cape Race (Figs. 1 and 2) are 952.10 square inches, and the latter may easily be vastly improved by adding the small dioptric arrangement in front of the flame (as shown on Fig. 3.) to collect and add to the beam those radiations which now escape at the open mouth of the reflectors. This arrangement does not obscure the rays of light reflected from the back of the silvered surface, for they are caused to pass through the focus, and form part of the beam.

XI. The preference to be given to catoptric, catadioptric, or dioptric systems of lighting in the colonies can be determined only when each special locality has to be provided for. It appears to me to be impossible to state any general principles to govern a selection of optical apparatus applicable to all colonies of the empire.

XVI. The ventilation of lanterns in England I have often found to be radically bad, and when similar ventilation is depended on for the colonies it is still worse. We can always admit plenty of air into a lighthouse lantern by special ventilating openings or chambers, or from the general ventilation of the lighthouse tower. There is but one way of getting the heated and vitiated air out of a lantern, that is most conveniently and effectively done by the cowl. My practice may be understood by the following description:—Each large lantern is ventilated in the floor by three or more equidistant ventilators, which admit and disperse the atmospheric air (avoiding sharp blasts and drafts), which is admitted from the outside by three or more radiating equidistant holes under the lantern floor, from each of

which holes cold air is admitted by the corresponding valve into the lantern floor, where it is dispersed into the lantern. For ventilation we must have a large open area in the cowl. The provision for escape of the heated air in the Great Isaacs Lighthouse lantern is only 70 square inches of area in the cowl, and the ventilation is very bad. I was not permitted to enlarge the cowl of that lantern; but about the same time the Lobos Cay lantern was ordered by me to have 153 square inches of area in the cowl.

The "description of oil generally burnt" in the different colonies for lighthouse purposes may be expected to vary much according to the soil and other circumstances. Startling variations in price of lighthouse oils will be seen in a return ordered by the House of Commons to be printed 29th June 1855. Therein the prices per gallon vary from 6d. to 14s.

XIX. The system of contracts by public tender for the construction and illumination of colonial lighthouses has certainly not promoted efficiency and economy. Great is the difference of materials and of workmanship, and however acute and experienced the civil engineer may be, a clever contractor can often defy detection in materials and workmanship. The looking for the lowest priced articles is very wrong. Articles are to be had cheaply which are really dear at any price. The contractor is often driven in such cases to work up to the mark "well enough," instead of to that mark, so essential to the efficiency of these important structures, the "perfect as possible." There are houses still who will not enter into competition for producing cheap work. What, I would ask, is the use of saving 1,000l. at home, if we have to pay 2,000l. in the colonies to make up for scamped work.

The professed economy in these matters is at variance with the individual practice of those who insist upon it. They individually know better where to apply when they order a telescope, a transit instrument, a gun, or a garment, or anything else within the bounds of their practical knowledge.

XXIII. "The course pursued by the governing authority "for ascertaining the value of proposals for improvements in the position, arrangement, classifications, or optical peculiarity of lights, or testing "new methods of using light," is generally unsatisfactory to the proposer. Sometimes the governing "authority" has left the entire matter to my own judgment and experience, uncontrolled (excepting in money matters) by any authority at home. These cases have always resulted in perfect success. "Classification," in which I include also uniformity of all the parts and stores common to all lighthouses is most important. Mr. Hume wrote to the Naval Commander-in-Chief in India in 1854:—"It will be seen by the correspondence with Mr. Alexander Gordon, Civil "Engineer, that if a proper arrangement was made "between the Admiralty or the Board of Trade and "the East India Company respecting lighthouses, the "whole of the articles required for lighthouses, as "to the size and nature of the lights, might be "supplied under his directions by contract in Eng- "land, and sent ready to be erected whenever required. "Every article should be made to fit the relative size "of the particular lighthouse for which it is destined; "and thus from time to time supplies of every requisite "might be all prepared of the proper dimensions, and "sent out on demand, without the great delay and "additional expense which has been, and must be, "incurred by the several colonies employing different "persons to fit up their lighthouses.

"There should also be a stock of such articles for "each description of lighthouse in store ready to be "furnished on indent.

"I trust I have stated enough to engage your attention and to enlist your best sympathies; and that "I, though not in office, may be allowed to influence "you in promoting the important objects herein ad- "verted to."

One great difficulty that I have experienced in regard to classification is the interest of tradesmen as well as the convenience of lighthouse boards at home, whose purpose is suited by shipping off apparatus and machinery almost worn out, and sending the same to the colonies, thus making an opportunity for having new and a higher order of apparatus on the coasts at home, just as if colonial communities have not as much to gain as those at home by good and efficient lightage.

I have, &c.

ALEXANDER GORDON,
M. Inst. C.E.

The following Circular was sent to a considerable number of the Companies whose vessels trade in the vicinity of the Lighthouses named ;

CIRCULAR XII.

The Commissioners appointed by the Queen to inquire into the condition and management of Lights, Buoys, and Beacons,—namely,—WILLIAM ALEXANDER BAILLIE HAMILTON, Esq., Rear-Admiral, R.N.; ALFRED PHILLIPS RYDER, Esq., Captain, R.N.; JOHN HALL GLADSTONE, Esq.; DUNCAN DUNBAR, Esq., Chairman of the London Local Marine Board; and SAMUEL ROBERT GRAVES, Esq., Chairman of the Liverpool Local Marine Board, by virtue, &c. &c.—request that your reply to the following Letter may be addressed to—J. F. CAMPBELL, Secretary, 7, Millbank Street, Westminster, S.W.

GENTLEMEN,—You are requested to favour the Commission with any information or Reports which you may have received through your Commanders, or others, as to the efficiency, utility, and apparent management of the whole or any of the Lighthouses undernmentioned, as compared with the best Lighthouses they are acquainted with on the coasts of England, or other European coasts, the Commissioners being desirous to ascertain how far these Lighthouses are maintained in good working order, and answer the end for which they were erected.

It would be meeting the views of the Commission if, in the absence of any existing collected Statements on Reports as to the efficiency and condition of these Lights, you would call upon the Commanders of your vessels now at home to give their opinion, in writing, on the above points, transmitting the same to this office.

I am, Your obedient Servant,
J. F. CAMPBELL.

I. BAHAMAS.

1. Gun Cay.—2. Cay Sal.—3. Abaco.—4. Great Isaacs (building).—5. Cay Lobos (building).

II. CAPE OF GOOD HOPE.

6. Roman Rocks (building).—7. South Point (building).

III. CEYLON.

8. Great Basses (building).

IV. NEWFOUNDLAND.

9. Cape Race.

V. IONIAN ISLANDS.

10. Cerigo.

VI. FALKLAND ISLANDS.

11. Cape Pembroke.

VII. WESTERN AUSTRALIA.

- 12, 13. King George's Sound, two Lighthouses.

The Surveyors report that from all the information they can obtain from Shipmasters lately passing through the Gulf of Florida, it appears that the lights are good, and no complaints are made.

II. and III. Not yet constructed.

IV. The steamers carrying the mails to and from America have Admiralty Agents on board from whom the best information will be obtained.

From the LIVERPOOL, NEW YORK, and PHILADELPHIA STEAM COMPANY'S COMMANDERS, now in Port.

I CONSIDER the Lighthouse on Cape Race from its position will be of *very great service* to mariners approach-

ing the land, and from its being of medium height the light will show better during the fogs which prevail on that coast. I cannot report upon the light as I have never seen it during the night.

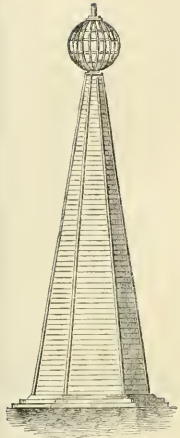
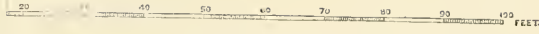
Liverpool,
12th March 1860.

SAML. BROOKS,
Commander S. S. "Kangaroo."

I HAVE seen Cape Race Light only once, it appeared to show well considering the distance I was off. A gun fired there (would be of great service to mariners both night and day) during fogs.

JAMES M. JEFFREY,
Commander S. S. "City of Washington."

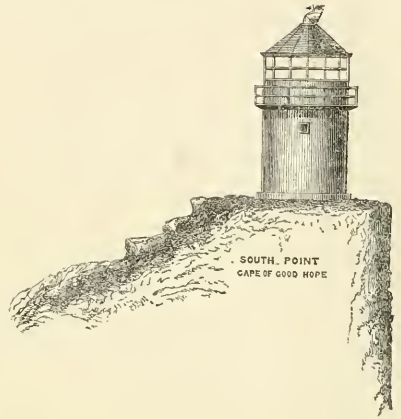
TON.



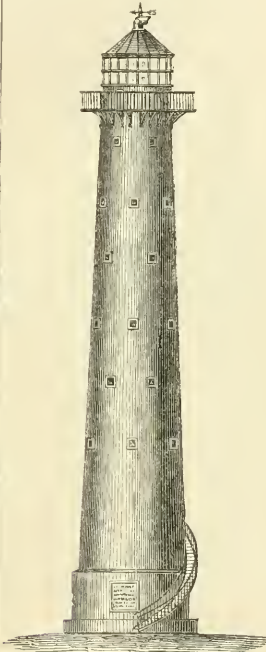
Beacon of wood.—Cape Race.



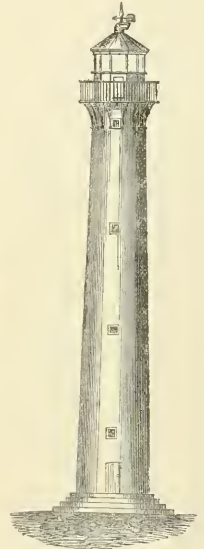
EMBERLAND.—South Australia.



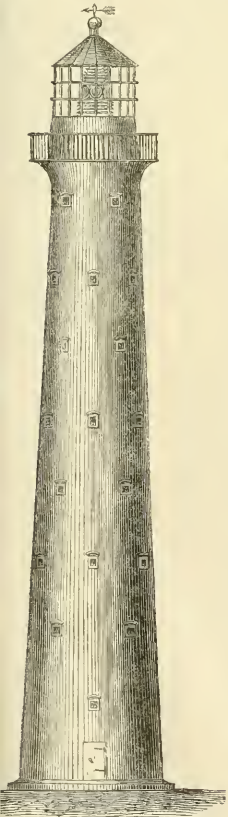
SOUTH POINT
CAPE OF GOOD HOPE



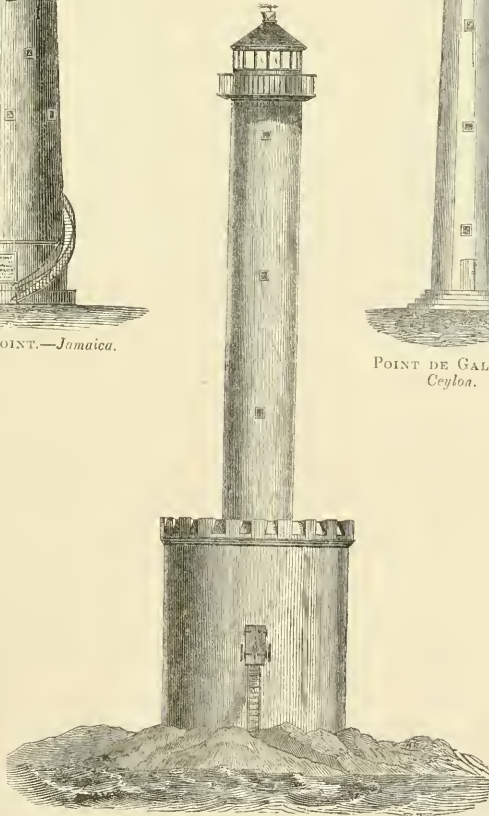
MORANT POINT.—Jamaica.



POINT DE GALLE.—
Ceylon.



BERMUDA.



GREAT BASSES.

High Water.

(To face page 650.)

HIS CATADIOPTRIC.

Fig. 3.

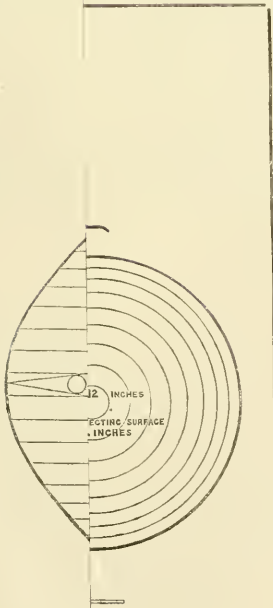
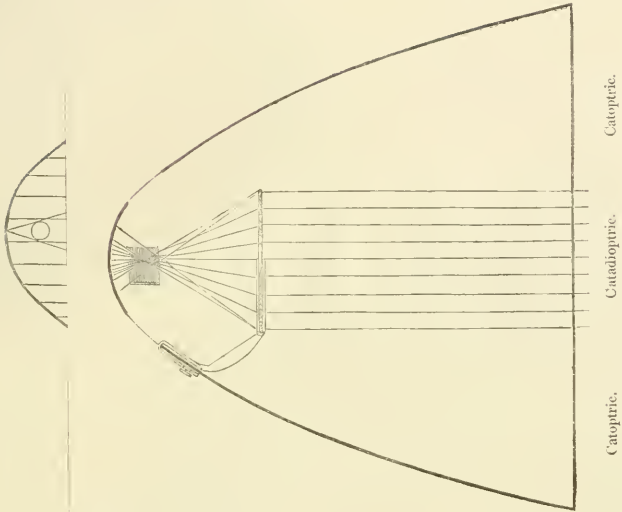


Fig. 8.

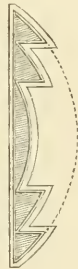


Fig. 9.



CIRCULAR XI.

I.—UNITED STATES OF AMERICA.

A return to the questions of the Commissioners was received on the 5th July 1859, and is as follows:—

Treasury Department
Office, L. H. Board,
June 16, 1859.

Hon. Howell Cobb, Secretary of the Treasury.

SIR,

THE letter of Lord Lyons, Her Britannic Majesty's Minister near this government, of the 6th inst., accompanying certain interrogatories as to the constitution and management of the Lighthouse Establishment of the United States, referred to this Board by the Department, has been received, and in reply thereto I have the honour to submit, by direction of the Board, the following answers to said interrogatories, viz. :—

Q. I.—Describe briefly the system of government adopted for the management of the lights, buoys, and beacons of the country and its dependencies, at home and abroad, giving full information as to the various superintending authorities, their powers and duties, and their responsibility to each other and to the general government of the country.

A. The Lighthouse Establishment of the United States is under the charge of a Board organized in conformity to law, approved Ang. 31, 1852, composed of the Secretary of the Treasury, ex-officio president, two officers of the navy of high rank, two officers of engineers of the army, two civilians of high scientific attainments, and one officer of the navy and one officer of engineers of the army as secretaries.

A permanent chairman presides over the meetings of the Board in the absence of the president,

In addition to the Board proper there are five clerks, viz. :—

One chief - - - - -	per an.	\$2,000
Two 3d class clerks, at \$1,600 each per an.		3,200
One 2d " " " " " "	1,400	" - 1,400
One 1st " " " " " "	1,200	" - 1,200
One messenger - - - - -		840
One labourer - - - - -		600
The incidental expenses for stationery, binding, &c. amount per annum to - - -		750
Total - - - - -		<u>\$9,990</u>

No officer of the army or navy serving on lighthouse duty receives any other compensation than that to which he is entitled in his grade in the service.

The ocean and lake coasts are divided into twelve districts, each one of which is under the charge of an inspector, who is an officer of the army or navy. These inspectors report directly to the Board. There are also in each district superintendents of lights, who are collectors of the customs, and whose duties are to disburse the money for the ordinary expenses of the establishment, on the certificates of the inspectors; to nominate keepers to the Secretary of the Treasury; and, in the sickness or necessary absence of the inspector, to perform his duties.

The inspectors and superintendents are directly responsible to the Board, but are in no respects responsible to each other.

Engineers are detailed from time to time from one or other of the two corps of engineers of the army, who are either inspectors of lights, and incidentally engineers of lighthouse construction in their respective districts, or who do duty as lighthouse engineers exclusively. All lighthouse structures are built under the superintendence of these officers. Designs for the structures are either furnished by the Board, or are submitted to it for approval before the work is commenced.

In the absence or sickness of an inspector or engineer, each does the duty of the other.

The inspectors are required by the regulations to make four visits annually to the lights in their district, and to report to the Board delinquencies of keepers, necessity of repairs, condition of lights, &c., and in addition to make an annual report of their operations during the year. This report is made on October 1st of each year.

They are responsible for all the property of the establishment in their respective districts, and for the proper disbursement of the money in the hands of superintendents.

The Board, in its turn, is responsible to the general government for the manner in which it performs its duties.

Q. II.—State briefly how funds are obtained for maintaining the lights, buoys, and beacons, and the cost of maintaining them for the year 1858, giving separately, if possible, the expenditures on lights, on buoys, and on beacons.

A. Funds for the support of the establishment are appropriated by Congress upon the estimates of the Board, approved by the Treasury Department, and no tax or toll is levied for its support.

The estimated or actual cost of maintaining the lighthouse establishment for the fiscal year, ending June 30, 1860, is \$802,889 90. This is exclusive of new stations, which are authorized by special Acts of Congress.

Lighthouses and light vessels - - -	\$685,661 12
Buoys and beacons - - - - -	117,228 78

Q. III.—Furnish a list of the lights on the coast.

A. The published list of lighthouses for 1859 is herewith furnished.

Q. IV.—If any general principles govern the selection of positions for lighthouses or floating lights, describe them.

A. The principles which guide the Board in the selection of sites for lighthouses are—

1. The position of the lighthouse with regard to the necessities of navigation.
2. The possibility of obtaining a proper foundation.

With respect to floating lights, the two considerations are—

1. The best position of the vessel to guard against the danger, or lead into the channel.
2. The security of the anchorage; though where it is necessary light vessels are anchored exposed to the full force of the Atlantic.

Q. V.—If lights are classified (for example, as sea-lights, harbour lights, &c.), describe the classification, and distinguish the classification on the list?

- A. 48 primary sea-coast lighthouse stations.
- 92 secondary sea-coast and lake-coast lighthouse stations.

296 sound, bay, river, and harbour lighthouse stations.

Q. VI.—State what is the number of keepers usually allowed in each class, and their salaries and allowsances.

A.			
1st-class lights	1 keeper	\$600	per annum.
" "	2 assistants	360	" " each.
2d-class	1 keeper	500	" "
" "	1 assistant	300	" "
3d-class	1 keeper	450	" "
" "	1 assistant	300	" "
4th, 5th, and 6th class - - -	1 keeper	400	" "

There are no allowances, but at a few isolated points rations in kind are supplied.

Q. VII.—If any general principles govern the selection of the class of light used in particular positions, describe them.

A. The principles which govern the selection of the class of light to be used are—

1. The distance at which the light should be visible.
2. The importance of the station.

Q. VIII.—Enumerate the mechanical variations in the machinery of the illuminating apparatus used, such as fixed, revolving, flashing, &c.

- A. Fixed.
 Revolving,
 Flashing,
 Fixed, varied by flashes.

The machine moving the apparatus is an ordinary clockwork machine, its size depending upon the order of lens.

Q. IX.—Enumerate the different colours of lights in use.

A. Natural colour and red.

Q. X.—If any general principles govern the selection of colour or mechanical peculiarity of lights, either as regards their own position or their relation to other lights, describe them.

A. The primary sea-coast lights are never coloured. In some cases these are double lights ; in other variable lights. Coloured and variable lights are used for the purposes of distinction merely, to avoid

as much as possible the danger of mistaking one light for another.

Q. XI.—Enumerate the different optical arrangements (catoptric, dioptric, &c.) used in lighting the coast. State which is preferred, and give any reasons that can be assigned for the preference ; distinguish in the list the lights supplied with optical apparatus of each kind.

A. The lens system is universally in use. This system is preferred, because—

- 1st. The primary sea-coast lights are more powerful than reflector lights can be made.
- 2d. For the same quantity of light the expenditure of oil is less.
- 3d. The annual cost of repairs and labour in the lens system is less than it is in the reflector system.

The lighthouse list shows the order of lens in each lighthouse.

Q. XII.—Furnish drawings of the most approved descriptions of illuminating apparatus employed, with the names of the makers.

A. Drawings are herewith furnished. The makers are Lepaute and Gauthier & Co., of Paris.

Q. XIII.—Fill up the accompanying table ?

A. The table is inclosed herewith.

TABLE showing—1st. The Price of the Illuminating Apparatus used, which is to include in one sum the Cost of the Optical and Mechanical Portions of each Description and Character used.
 2d. The estimated Annual Cost of ordinary Repairs, in which are to be included Glass Cylinders, Wear and Tear, and Cleaning Stores consumed.
 3d. The Consumption and Cost of Oil and Wicks consumed in a hundred hours. The Cost of Oil to be estimated at Forty-pence the gallon.

N.B.—If any extraordinary Repairs can fairly be expected to recur periodically, they are to be stated separately, unless they are previously given under the head of Wear and Tear.

Description (Dioptric, Catoptric, &c.), stating Order or Number of Burners.	Character.					REMARKS.
	Fixed.	Flashing.	Fixed and Flashing.	Intermittent.	Revolving.	
1st order lens. { Price - - - \$8,000 Ordinary repairs - - \$95 Oil - { Consumption 15 gals. Cost - - - 2l. 10s. Wicks { Consumption '46 yard Cost - - - 11½ cents.	\$8,000	\$11,000	\$10,500	\$10,000	\$10,500	The gallon is the American standard gallon of 231 cubic inches. The price of sperm oil delivered at the lighthouses during the current year is at least \$1.50 per gallon.
2nd order lens. { Price - - - \$5,000 Ordinary repairs - - \$95 Oil - { Consumption 10½ gals. Cost - - - 1l. 15s. Wicks { Consumption '46 yd. Cost - - - 10 cents.	\$5,000	\$6,700	\$7,845	\$6,675	\$7,276	Under the head of ordinary repairs, the item for flashing or variable lights in general is increased, to cover the liability of the revolving machine to get out of order, and its wear and tear. The other items are unchanged.
3rd order lens. { Price - - - \$2,750 Ordinary repairs - - \$60 Oil - { Consumption 3½ gals. Cost - - - 12s. 6d. Wicks { Consumption '46 yd. Cost - - - 7.4 cents.	\$2,750	\$4,279	\$4,000	\$3,500	\$5,500	
4th order lens. { Price - - - \$859.57 Ordinary repairs - - \$25 Oil - { Consumption 1½ gals. Cost - - - 6s. 3d. Wicks { Consumption '46 yd. Cost - - - 8½ cents.	\$859.57	\$881.46	\$1346.75	-	\$1,478.74	There is another order of lens, not yet in use on the coast of the United States, which in size comes between the 3d and 4th orders. A two-wicked lamp will be burned in it, and the consumption will be a little less than that of the 3d order lens.
5th order lens. { Price - - - \$500 Ordinary repairs - - \$25 Oil - { Consumption 1.14 gal. Cost - - - 3s. 9d. Wicks { Consumption '46 yd. Cost - - - 8½ cents.	\$500	\$45	\$900	-	\$1,038.91	
6th order lens. { Price - - - \$395 Ordinary repairs - - \$25 Oil - { Consumption 1.14 gal. Cost - - - 3s. 9d. Wicks { Consumption '46 yd. Cost - - - 8½ cents.	\$395	\$25				
Reflectors, 1 lamp. { Price - - - Ordinary repairs - - Oil - { Consumption 0.913 gal. Cost - - - 3s. 0½d. Wicks { Consumption 1½ wicks Cost - - - 2 cents.						

Q. XIV.—If any general principles govern the selection of optical apparatus for particular lights, either as regards their own position or with relation to other lights; describe them?

A. Answered under Question 10.

Q. XV.—State what is considered to be the extreme height above the level of the sea which should not be exceeded in placing the light of a lighthouse.

A. As a practical question, a height of 200 feet is regarded as the limit.

Q. XVI.—Describe the most approved method of ventilating the lanterns of lighthouses.

A. The lanterns are ventilated by the admission of cold air in the lower part of the lantern, or in the parapet wall under the lantern, the quantity of which air is regulated by registers. The heated air passes out through a ventilator in the top of the dome.

Q. XVII.—State what is the description of oil generally burned?

A. Sperm oil is exclusively used.

Q. XVIII.—If any other method is used for producing light, a special report is requested of its comparative merit as respects efficiency and cost.

A. No other method is used. In one or two instances, where a light is in or near a town, coal gas is used. The result has been satisfactory.

Q. XIX.—State whether the system of contracts by public tender is adopted with regard to

- a. Building lighthouses or light vessels, and making buoys and beacons.
- b. Making illuminating apparatus.
- c. Painting.
- d. Obtaining stores.
- e. Or in any other particulars.

If so, state whether the system promotes efficiency and economy.

A. a. Generally masonry lighthouses are built by days' labour, but the materials are furnished by contract. Iron lighthouses are built by contract.

Light vessels are either built by contract or in the navy yards, and in the latter case the cost is charged to the lighthouse establishment. Iron buoys are manufactured in the Washington Navy Yard, and their cost is charged to the Lighthouse establishment. Wooden spar buoys are furnished by contract, and are put down by the tenders.

b. Illuminating apparatus are furnished by two makers in Paris, and the prices are regulated by the French government.

- c. Painting is done by days' labour.
- d. Stores are obtained by contract.

It is believed that the contract system, as carried out by the Lighthouse Board, promotes efficiency and economy.

Q. XX.—Describe briefly the means adopted for testing all stores supplied.

A. Every cask of oil, as it is delivered, is tested in the following manner:—

1. Specific gravity is to be .875.
2. Temperature, to stand liquid at 32°.
3. Burning. A jacket lamp is filled with oil from the cask, and is lighted. The whole of the oil in the lamp must be consumed without residuum.

All other stores are examined by one of the inspectors before they are received. The usual tests to insure good articles are applied; but an experienced person easily determines with regard to wicks, scissors, paints, brushes, &c.

Q. XXI.—How often are lighthouses, light vessels, buoys and beacons, painted or otherwise coloured; and what materials are preferred?

A. Lighthouses are painted once in about three years, except iron structures, which are painted every year. Light vessels and buoys are painted twice a year, and the latter are shifted twice a year, spring and fall.

Zinc and lead paints are both used.

No conclusion has been arrived at as to which is the best material. Verdigris has been used for paint-

ing wooden buoys below the water with good effect, as a preventive of the worm.

Q. XXII.—If any general principles govern the selection of colours, or arrangements of colour, for distinguishing or identifying particular lighthouses or lightvessels, buoys or beacons, describe them.

A. Where lighthouses are contiguous, and of the same size and general appearance, they are of different colours; either the natural colour of the material, or some other colour dependant upon the nature of the back ground. Where a lighthouse is projected against the sky, it is coloured with some dark paint; where projected against the land, it is painted white. No colours are used to identify particular lighthouses.

In conformity to law, red buoys with even numbers (2, 4, 6, 8, &c.) are placed on the starboard side of channels, to be left on the starboard hand in entering from seaward; black buoys, with odd numbers (1, 3, 5, 7, &c.), are placed on the port side of channels, to be left on the port hand in entering from seaward; buoys with red and black stripes are placed on obstructions having channel ways on either side; and buoys with white and black perpendicular stripes are placed in mid-channel, to be passed close to, to avoid danger. Other distinguishing marks, such as perches, with balls, cages, &c., are placed to mark special localities, the colouring and numbering indicating on what side they should be passed, as will appear from the published buoy lists; and the same rules, with the exception of numbering, apply in general to beacons.

Q. XXIII.—Describe the course pursued by the governing authority for ascertaining the value of proposals for improvement in the position, arrangement, classification, mechanical or optical peculiarity or colour of lights; for testing new methods of producing or using light or ascertaining the value of any other proposals for improving the lighting or buoying, &c.; of coasts, harbours, channels, &c.

A. When any proposed improvement of the kind specified is brought to the notice of the Board in such a shape that its feasibility can be tested, it is referred to a committee of the Board; it is examined by the committee, and a report is made to the Board by it. If the Board considers it advisable that the improvement be introduced, it takes the necessary action in the case. The expense of the examination is borne by the proprietor, except such expenses as may be incurred by the members of the Board in going to and returning from the place of examination.

Q. XXIV.—Furnish a list of the meteorologic instruments used in lighthouses and light vessels, and any printed regulations regarding them which are given to keepers.

A. No meteorologic instruments are furnished to lighthouses.

A journal of the direction and force of the wind, of the weather, and of the temperature is kept in the light vessels, for which purpose a thermometer is furnished. A copy of the journal is enclosed.

Q. XXV.—Describe the most approved system for indicating the state of the tide to passing ships by day or night.

A. A system of signals for this purpose has been adopted; the necessity for it has not become apparent, on account of the small rise and fall of tides along the coast generally, and because the harbours have sufficient water at their entrances at all times of tide. There may be one or two exceptions to this rule, but the signals are in charge of the pilots.

Q. XXVI.—Describe the means adopted during fogs for warning ships of their proximity to danger, or for informing them of their position.

A. The most usual means is by sounding a bell, which is rung at fixed intervals by a clockwork arrangement. Fog horns are also used on light vessels.

Steam whistles have been tried, but hitherto without useful results. The air whistle, it is hoped,

will answer a useful purpose ; but no opinion can be given on the subject without further test.

Q. XXVII.—Furnish a coloured drawing, plans, and section to scale, of the best modern lighthouse in the country, with a statement showing—

- a. The material of the building.
- b. The position of the oil stores.
- c. The quantity of spare stores, lamps, &c., kept ready.
- d. The details of the cost of maintenance for one year, including all ordinary expenditure.
- e. The price of the illuminating apparatus.
- f. The cost of the whole construction, from its commencement till the first exhibition of the light, including the price of the illuminating apparatus.

A. The drawings furnished give the information asked for, except the cost, and the cost of maintenance for one year, which latter has already been given.

The first-order lighthouse, as shown by the drawings, cost \$43,000, including the illuminating apparatus, which cost \$8,000.

Q. XXVIII.—Furnish drawings to scale of the buoys commonly used, with a statement showing the material of which they are made. The method of mooring, and the position for which each kind is best fitted, as for harbours, channels, exposed coasts, tide-ways, &c., and the price.

A. The inclosed drawings show the materials and dimensions of the buoys and their moorings.

Nun and can buoys are used where they are required to be seen some distance.

In close harbours and tideways spar buoys are used.

1st-class iron nuns and cans cost between \$400 and \$500.

2d-class iron nuns and cans cost between \$300 and \$400.

3d-class iron nuns and cans cost between \$200 and \$300.

Spar buoys ready for placing cost from \$10 to \$35, dependant upon the size.

Q. XXIX.—If any general principles govern the buoying of channels, harbours, rivers, or dangers, describe them.

A. Buoys are placed to mark channels, and to give warning of obstructions.

Q. XXX.—Furnish drawings to scale of any buoys and beacons which have any peculiarity of form, construction, or principle which might become generally useful ?

A. Drawings of all buoys are furnished herewith.

Q. XXXI.—Furnish copies of all general rules and regulations issued for the inspection and management of lights, buoys, and beacons, and copies of all printed forms relating thereto.

A. All of the books, &c. asked for are herewith furnished. The following is a list, viz. :—

Book of Rules, Regulations, and Forms of the United States Lighthouse Establishment.

Book of Rules, Regulations, and General Instructions.

Report of the Temporary Lighthouse Board, 1851. Additional Report, 1852.

Report and Estimates, 1857.

Three copies, Report of Lighthouse Board on Expenditures, 1858.

Two copies, Annual Report of Lighthouse Board, 1858.

Instructions and Directions to Lightkeepers, 1858.

Buoy Lists, 1st, 2d, 3d, 4th, 5th, 6th, 7th, 8th, 9th, 10th, and 11th Lists.

Three copies, Lighthouse List, 1859.

One blank book, Descriptive List of Lighthouses.

“ “ “ “ “ Light Vessels.

“ “ “ “ “ Inspection Book, Lighthouses.

“ “ “ “ “ Light Vessels.

Various drawings and photographs of lighthouse works, collected from time to time, embracing

nearly all of importance that have been erected under the direction of the Lighthouse Board.

One copy of Lighthouse Maps, embracing Atlantic and Gulf coasts. Two series.

The following answers are submitted in reply to the interrogatories concerning Light Vessels of the United States, viz. :—

Q. I.—Furnish drawings to scale of the best floating light on the coast, showing—

- a. The hull as coloured, and its dimensions and lines, with sections showing the internal arrangement.
- b. The draft of water.
- c. The masts.
- d. The moorings.
- e. The method of mooring.
- f. The illuminating apparatus in position.
- g. The mode of suspending the lantern.
- h. The mode of suspending the lamp.

A. Drawings are furnished, showing all the desired points.

Q. II.—Furnish a statement, showing a name and position of the same floating light.

- b. The material of the hull.
- c. The number of miles the light is seen in clear weather by the naked eye from an altitude of 18 feet.
- d. How the vessel is fitted with sails.
- e. What ground tackle is kept on board in case of moorings parting.
- f. What means are in command, if any, for communicating by signal by day or by night.
- g. What means are at command for assisting the shipwrecked, by lifeboat or otherwise.
- h. The number of the crew.
- i. How often they are relieved.
- j. The time the vessel usually remains on her station without going into harbour for repairs.
- k. The annual consumption of oil and wicks.

A. Nantucket New South Shoals Light vessel.

- b. Wood.
- c. About 13 miles.
- d. Schooner rigged, with fore and aft sails.
- e. Spare anchor 3,500 lbs, 76 fathoms chains, 1½ inch.
- f. Rogers' marine signals.
- g. Two whale boats.
- h. Eleven, including keeper and mates.
- i. They are permanently stationed.
- j. No regular intervals, but at least once a year.
- k. About 600 gallons of oil and 100 feet wicks.

Q. III.—Furnish a financial statement with regard to the same floating light, showing—

- a. The cost of the hull.
- b. Cost of illuminating apparatus.
- c. Cost of vessel when complete for service, exclusive of victualling and lighting stores.
- d. The annual cost of oil and wicks.
- e. The annual cost of repairs to illuminating apparatus.
- f. The estimated annual expenditure in maintaining the floating light in a state of complete efficiency on an average of eight years.
- g. The scale of wages paid to the crew.
- h. The annual cost of victualling and allowances.

A. a. \$17,800, including tackle, apparel, and furniture.

- b. \$2494.35.
- c. About \$21,000.
- d. Oil, \$750 ; wicks, \$9.
- e. About \$10 contingent.
- f. About \$6,500, including about \$1,000 for repairs, &c.
- g. One keeper, \$1,000 per annum ; 1st mate, \$40 ; 2d mate, \$30 ; and 8 seamen at \$18 each, per month, with oration for each person; ration costing \$20.53 per quarter.
- h. About \$993.32.

Q. IV.—Are there any instances on record of floating lights being off their stations in the last five years? If so, please to state how often, and the cause of the accidents.

A. There are such instances, at least one per year for each light vessel. They are generally caused by the vessels parting their moorings through stress of weather, or by the keepers wilfully slipping the cables.

Information of a character similar to that above submitted of the constitution and government of the British lighthouse system would be highly acceptable to the Board.

I have the honour to be,
 Very respectfully,
 Your obedient servant,
 W. B. SHUBRICK,
 Chairman Lighthouse Board.

R. SEMMES,
 W. B. FRANKLIN, } Secretaries.

NOTE.—This return was accompanied by the following documents:—

1. Report of the Lighthouse Board, dated 4th February 1852, 760 pages, with numerous lithographs.
2. Similar report, dated July 7, 1852, containing references to European lights, &c., 72 pages.
3. Estimates of appropriations to Lighthouse Establishment, Oct. 8, 1857, pp. 89 to 259.

4. Report of the Lighthouse Board to the Secretary to the Treasury, &c., with regard to the expense of erecting lighthouses, &c., March 13, 1858, 125 pages.

5. Report of the Lighthouse Board, October 6th, 1858, 9 pages.

6. Specifications of Shell Keys Lighthouse, 1858.

7. Rules, Regulations, and General Instructions, 1857, pages 76.

8. Ditto, a smaller edition, 107 pages.

9. Instructions to Lightkeepers, 93 pages.

10. 4 blank books for inspection, with printed headings, to be followed by remarks.

11. A number of miscellaneous forms of tender, Acts of Congress, &c., &c.

11. Lists of all the lights, buoys, and beacons on the coasts of the United States.

12. A set of charts, showing the position of the lights; their distinctive peculiarities in colour. Lithographed.

13. Set of 14 lithographed drawings of an iron-pile lighthouse, Atehafalaya Bay. Scale $\frac{1}{4}$ inch to foot.

15. Similar drawings of lighthouse at Shell Keys, 20 in number.

12. A book containing 95 sheets of similar drawings, which include minute details of the construction of all parts of lighthouses, floating lights, beacons, &c.

17. A set of 10 well executed large photographs of lighthouses on the coasts of the United States, showing their general appearance, and that of the locality, and in some instances even the illuminating apparatus inside the lantern, so as to distinguish its general appearance and many of its details.

[The whole of these documents, have been placed together, and should be carefully preserved.]

2.—TURKEY.

The following correspondence relates to the return which the Turkish Government were requested to furnish:—

Foreign Office,
 November 8, 1859.

Sir,

With reference to your letter of the 16th of April last, I am directed by Lord John Russell to transmit to you, to be laid before the Lighthouse Commissioners, the accompanying copy of a despatch from Her Majesty's Ambassador at Constantinople, stating the reasons why the Turkish Government is unable to answer the Commissioners' inquiries.

I am, Sir,
 Your most obedient,
 humble servant,

J. F. Campbell, Esq.,
 Lights, Buoys, and Beacons
 Commission.

JAMES MURRAY.

Therapia, October 26, 1859.

MY LORD,

On the 4th of June last I received from your Lordship's office a Despatch marked "separate" of the 14th May, enclosing copies of certain queries to which the Lighthouse Commissioners were desirous of obtaining answers from the Turkish Government. At my request, these queries were duly transmitted by Fuad Pasha to the Turkish Admiralty, with instructions to supply the desired information without delay. It was, however, only on the 17th ultimo, that a general and unsatisfactory answer was returned to the queries. Fuad Pasha then addressed another letter to the Capitan Pasha, couched in pressing terms, asking for more precise information; but to this fresh application the following answer was returned:—

"That as the system of lighthouses is not yet completed, and as no more than half the lighthouses have been constructed, the Board of Admiralty is at a loss to furnish the information required."

I have, &c.

3.—N O R W A Y.

The following preliminary report on Norwegian lights was received from the British Consul General at Christiania, J. R. Crowe, Esq., on the 30th of September 1859 :—

British Consulate General,
Christiania, 30th September 1859.

GENTLEMEN,

From the accompanying description, in original and translation, of the lights and beacons on the coast of Norway, you will ascertain the number and character of the several lights in operation at this date.

With respect to the administration of the system, it is entrusted to the supervision of a director, with the necessary number of assistants, all under the Royal Marine Department.

The official duties of the director consist as follows :—

1st. To inform himself, by personal inspection, that the officials under him attend to their respective duties in superintendence of the lights, with due regard to punctuality and order, and exercise the necessary care and control in the use of the stores required for the sustenance of the lights, as to ensure the necessary degree of economy ;

2dly. To take care that the lighthouses are always kept in proper repair, and are furnished with the requisite supply of stores ;

3dly. To prepare estimates and drawings for new lighthouses, and to superintend their construction, when decided on ;

4thly. To render accounts of the expenses incurred in the construction of new lighthouses, as well as of the supplies provided for the proper maintenance of existing lighthouses ;

5thly. To suggest the erection of new beacons and mooring rings along the coast, when necessary, as well as to attend to the conservation of all that appertains to the system ; and,

6thly. To render an account of the means employed for the same.

The officials or assistants under him are appointed by the Marine Department, at the recommendation of the Director.

With a light of the 1st order there is one light-master and two assistants.

With a light of the 2d order one light-master and one assistant.

With lights of the 4th, 5th, and 6th orders, one light-master.

The duties devolving on these officials or attendants will be found in the detailed instructions.

The salaries are as follows :—

Director of the Lights, \$1,200 = 270*l.* ; assistant to ditto, \$400 = 92*l.* ; light-masters at the lights of the 1st order as well as second, \$400 to \$620 = 110*l.* to 143*l.*, besides free house and free use of the ground attached to the lighthouse, with the obligation to keep a man to assist in warming up the lighthouse rooms, &c.

The attendants at the lights of the 4th, 5th, and 6th order receive from \$80 to \$320, or from 18*l.* to 78*l.*, according as the light burns the whole year through or only partially. The officials have also, as a rule, free house, with the obligation to keep a servant to assist them.

The assistants have an annual salary of \$160 = 35*l.*, with free house.

The consumption of stores for the maintenance of the lights, and repairs, may be taken as follows :—

The quantity of rapeseed oil consumed on an average by a light of the 1st order is equal to 1·11 lbs per hour.

By a light of the 2d order, - - - 0·88 lbs.
Ditto 4th ditto - - - 0·26 „
Ditto 5th and 6th - - - 0·1 „

The average price paid for the best refined rapeseed oil has, for the last three years, been 16 skillings per lb., or 7½*d.* sterling per lb. of 18 ounces avoirdupois.

The cost of the other materials, and of the annual repairs for all the lights, amounts to \$6,100, or 1,408*l.*

The last lighthouse constructed in the country was that of Rundö, of the 1st order ; the tower is of cast iron, 110 feet high from the foundation to the centre of the light. It cost, including the dwelling for the attendants, \$47,000, or 10,800*l.*

According to the above, the annual expenditure for the light system in Norway, at the end of last year, amounted to :—

Salaries to officials	-	-	-	\$22,859
Travelling expenses of director and assistants	-	-	-	1,000
Ground rent	-	-	-	1,035
Oil consumed, 101,760 lbs., at 16 skillings	-	-	-	13,568
Materials, &c. for repairs	-	-	-	6,100
				<u>\$44,562</u>

Equal to 10,283*l.*

It is necessary to observe here, that the assistants to the director, as a rule, are generally naval officers, therefore, in addition to \$400 per annum, they are in receipt of pay as naval officers.

At the end of last year the system in Norway comprised—

17 coast lights.
28 channel lights.
10 channel and harbour lights.
12 harbour lights.
1 floating light.

Thus, in all 68 lights, at an annual cost of 10,283*l.*, or about 15*l.* 15*s.* per light.

Of these only three were of the 1st order, and six of the 2d order.

Since last year six new lights have been established along the northern coast and Finnmark, two of which are of the 2d order.

The printed queries have been distributed which you furnished me with, but not any have been returned yet, owing chiefly, I presume, to the absence of most of the shipmasters engaged in the foreign trade. As soon as received they will be truly transmitted.

I have the honour to be,

Gentlemen,

The Royal Commission, Your obedient servant,
Lights, Buoys, and Beacons. J. R. Crowe.
&c. &c. &c.

This letter was accompanied by a printed list of lights, &c., with a translation. These have been placed together, and should be carefully preserved.

Sir, October 11, 1859.
I am directed to acknowledge the receipt of your letter of the 30th September, and the information relative to Norwegian Lights, &c. I am to express the thanks of the Commissioners for the trouble which you have taken.

I am, &c.

J. R. Crowe, Esq.,
H.M. Consul General,
Christiania.

TRANSLATION OF THE RETURN FURNISHED BY THE NORWEGIAN GOVERNMENT.

Information respecting Lighthouses, &c. in Norway.

I. The lighthouse service is under the direction of an officer appointed by the King, and styled Director of Lighthouses, who is subordinate to the Department of Marine. His duties are:—

- a. Personally to superintend that the servants employed about the lighthouses perform their functions with order and attention; to control the entire course of their duties, and especially to promote economy in the consumption of requisites.
- b. To have charge of the repairing and preservation of the lighthouses, and of providing them with necessaries.
- c. To make estimates and drawings of new lighthouses, and to superintend the building of such.
- d. To render account of expenses incurred in erecting new lighthouses, and in providing for all of them.
- e. To propose and have charge of placing out sea-marks and moorings along the coast, and to keep the same in proper preservation, as far as regards such parts of the coast as are not in the immediate vicinity of towns, and consequently come under the harbour regulations of these.
- f. To render account of the expenses incurred for works specified under letter e.

The Director of Lighthouses has a salary of 1,200 specie-dollars per annum, besides which he has a grant of 200 specie-dollars annually for office expenses, &c.; he is, moreover, provided with apartments, fuel, and candles free of charge. The Director of Lighthouses has the aid of an assistant, who receives his appointment by the Marine Department, and is generally a naval officer; such is in fact the case at present, and the said officer retains his pay as such. The assistant's salary is 400 specie-dollars a year.

Remark. — The administration of the lighthouse service is not at the present time organised in a satisfactory manner, inasmuch as both the director and the assistant, owing to the considerable increase in the number of lighthouses which has taken place of late years, have become so overburthened with office work that it is impossible for them to exercise so much personal control over the lighthouses, and to devote that care and energy to the development of the lighthouse system in general, which may be considered desirable. A proposal will therefore be submitted to the legislature in its approaching session, having for its object alterations by the means of which the administration will be organised so as to bear a more just proportion than at present to the extended sphere of its business. In particular, it is intended to appoint a special officer as cashier and keeper of accounts, under the Director of Lighthouses, and to provide for the latter such official accommodation as hitherto has been felt to be wanted, and also the requisite means for making experiments with lamps, lighting substances, &c.

- II. The necessary means are obtained from the treasury of the State, in pursuance of grants voted by the Diet (Storting). The last ordinary Diet (in 1857) granted for the support and maintenance of lighthouses 21, 134 specie-dollars annually, and for the maintenance of sea-marks and moorings 1,538 specie-dollars annually, which grants were in accordance with the sums expended in the years next preceding for such purposes. It should be observed, however, that this expenditure only partially includes the sums required for channel and harbour lights, because several of these, namely, Hagholmen, Stølene, Fietvedt, Rødtangen, Moss, Tungenæs, and Nordnæs, have been erected and are maintained by the harbour services of the towns concerned, and Alnæstangen by the rural commune adjoining. In the same manner are the expenses for sea-marks and moorings in and near the harbour defrayed by their harbour administrations.
- III. The accompanying "Short Description of Lights and Day-marks on the Norwegian Coast," as well as table, contain the information here desired. In the above-mentioned description the department has caused the additional insertion of lights established subsequent to the

printing thereof, or such as have been lighted in the course of the autumn of the present year.

- IV. The principles herein referred to have been set forth in the accompanying two reports, one of the 20th October 1851, the other of 6th October 1855, by Committees appointed, in virtue of Royal Resolutions, to submit proposals in respect of the most suitable mode of placing new lighthouses, and whose recommendations in the main have been followed during the subsequent development of the country's lighthouse system.
- V. VII. A distinction is made between coast-lights, channel-lights, and harbour-lights. The meaning and objects of the first named do not require any further explanation. Channel lights are such as, in conjunction with coast lights, serve to direct vessels on towards their ports, or to other important places near the coast, to wit, the fishing stations. Harbour lights conduct immediately into port. The description referred to under Clause No. 3, indicates the class to which each of the several lighthouses in the country belongs. Moreover the lighthouses are classed according to their orders, in accordance with the system of Fresnel as followed in regard to the principal Norwegian lights. The classification of the lights according to this order is likewise indicated in the above-mentioned description as well as in the table.

VI. At a lighthouse of the 1st order, there are appointed one lighthouse keeper and two assistants.

At a lighthouse of the 2nd order, there are appointed one lighthouse keeper and one assistant.

4th. }
5th. } One lighthouse guard.
6th. }

At Lister's and Udsire's Lighthouses there are also under-keepers appointed.

Lighthouse keepers have a salary of from 470 to 620 specie dollars per annum, together with free apartments, and the usufruct of such pieces of land as may belong to the lighthouses, on condition of keeping a man at own cost, to assist in keeping the lighthouse in order, and make the fires in the tower apartments. The salary of the lighthouse guard amounts to from 80 to 320 specie dollars, according as the lights are kept during the whole or only a certain part of the year, and is in other respects regulated according to different and in part local circumstances. These officers have also, as a rule, free apartments, and are bound to keep the fire in the lighting chamber, and some of them are also allowed to keep a man at their own charge to aid in managing the light. The Assistants are paid 160 specie dollars per annum, and have apartments free. The salary of the under-keepers is 216 specie dollars a year, besides free apartments. All these officers receive, moreover, at present, dear-time additions, after a scale of 30 per cent. on the first 200 specie dollars, 20 per cent. for the next 200 dollars, and 15 per cent. on any sum exceeding that, of each person's annual pay.

VIII. The information here desired will be found in the before-mentioned description and table.

IX., X. All the lights are white, with the exception of Stavarn Point, where, to avoid confusion with other lights, it is green, and Stangholmen, Svino, and Moss Lights, which for the same reason are red. Aalesund will likewise from and after this autumn be changed to a red light.

XI. XII. and XIV. As stated above, the system of Fresnel is here principally in use, because it is considered to be the best. In the before-mentioned description and table, the lights which are arranged according to this system are indicated with the marks of the different orders, ⊙1, ⊙2, &c. Drawings of the apparatus used in this system consequently correspond to the apparatus employed with us. They are procured from Henry Lepaute's establishment in Paris, and received upon a verification from the French Director of Lighthouses as to their being constructed with the same care and precision as are required for such works by the French lighthouse administration. The glass reflectors are obtained from St. Gobain's glass entrepôt in Paris, under a similar guarantee.

XIII. The information desired here and in the schedule referred to is communicated herewith as follows:—

- a. The prices are presumed to be the usual from Le-paute's establishment. A copy is annexed of the last agreement concluded with him for apparatus of the different orders herein use.
- b. Of oil (rapeseed) is consumed on an average for—
- | | |
|--------------------------|---------------------|
| A light of the 1st order | 1·11 lbs. per hour. |
| " " 2nd | " 0·88 " " |
| " " 4th | " 0·26 " " |
| " " 5th | " " " " |
| " " 6th | " 0·10 " " |

The average price for best quality refined rapeseed oil has been during the last three years about 16 sk. per lb.

The expenses of providing other necessary articles of consumption, and of repairs, may be estimated at a sum of 6,100 specie dollars a year for all the lighthouses taken together.

XV. The oft-mentioned description and table show that an elevation of 248 feet above high-water mark is the highest in this country.

XVI. The mode of ventilating is treated of in the 1st part, § 6, No. 4, and §§ 7 and 22, of a regulation appertaining to the instruction for lighthouse officers issued in the year 1853, a copy of which instruction is annexed.

XVII. Answered under No. XIII. b.

XVIII. Wood-oil has been tried at Bastö and Vibberodden; and at Lister trials have been made with train-oil. No result, however, has as yet been arrived at as to whether these lighting substances are preferable to rapeseed oil or not.

XIX. Answered under No. XII. as far as regards the apparatus. With reference to the lighthouse-buildings, &c., several methods are in use, according to circumstances. All the more important works are executed by the lighthouse establishment itself with hired hands. Isolated and less important buildings are carried out by contract work. This has, for instance, been the case with some wooden buildings for the lighthouses in Nord-land, which houses have been erected in this way, and thereupon despatched to their places of destination. The oil is provided by the department, which at the commencement of every year, with this view, issues an invitation, by means of the newspapers, to send in sealed tenders, stating lowest price, for the supply of the lighthouses, within a certain time. On the day appointed these tenders are opened in the department, and a contract, according to circumstances, thereupon made with the party offering the lowest tender. A copy of the notification for this year is annexed. The other necessities for the lighthouses are purchased, partly by the director of the lighthouse service, partly by the lighthouse keepers and guards. The provisioning of the lighthouse officers is effected by themselves.

XX. Rules for the testing of oil are specified among the conditions for oil-delivery contracts. See the Notification (No. 5), referred to under Clause XIX. and Sect. XXXVII. of the regulations appertaining to the instruction.

XXI. and XXII. The oft-mentioned table shows the colours of towers. The colour is selected with the view of

making the respective lighthouses easy of distinction one from another, and partly also to make them more conspicuous as seamarks.

XXIII. This has been in part answered under No. I. When questions arise as to the desirableness of improvements, such information is sought as may, like it happens in any other case, be considered to the purpose. Sometimes it is enjoined, for instance, the commanders of steamers belonging to the postal service to make observations respecting the lighthouses under consideration when passing them. The director of lighthouses and the harbour master investigate the questions that arise on their journeys of inspection, &c.

XXIV. and XXV. Observations of the nature here indicated are not yet instituted at our lighthouses.

XXVI. Means for warning vessels during a fog exist as yet only at Tulehuk, where there is a bell. A similar one is being placed at Little Færders Lighthouse.

XXVII. A drawing is annexed of Little Færders Lighthouse, whose tower is of the 1st order, and was built in 1857.

a. Cast iron.

b. The two stories next below the gallery.

c. About the middle of every year there is brought in a supply of about 5,000 lbs. of oil, of which quantity there generally remains but little over when the new supply comes in. There are three mechanical lamps in this light apparatus.

d. In a list annexed is shown the consumption of various necessities during the year 1858, to which should be added expenses of repairs, amounting, however, only to 200 specie dollars.

e. The cost of the lighting apparatus has been 38,800 francs, 30 cents, to which should be added the cost of window-glass, 382 specie dollars.

f. The whole expense of erecting the lighthouse, including lighting apparatus and window glass, amounted to about 33,000 specie dollars. In this, however, are only comprised the expenses for the tower, which is built on the island Little Færder; the buildings for the persons employed about the lighthouse, &c. which had previously been erected on the island of Great Færder in connection with the old and now abandoned light-tower there, being still made use of. The cost of Andenes Lighthouse (of the 2nd order), which has this year been completed, amounts in the aggregate to about 51,000 specie dollars. The cost of Fruholmen's Lighthouse (of the 1st order), which the department has proposed to erect in the term of the next budget on the island of Ingö, in lat. 71° 5' 45" N., is estimated at 36,655 specie dollars.

XXVIII. XXIX. and XXX. The form and size of buoys, moorings, and marks, &c. are determined with regard to locality, and by so many other circumstances besides, that no general rules in this respect can be laid down.

XXXI. Instructions, &c. are adjoined.

4.—S W E D E N.

The following report was received on the 16th of January 1860, together with a further return from the Norwegian Government, which is added to the information previously obtained from the British Consul General at Christiania, J. R. Crowe, Esq., on the 30th September 1859.

REPLIES TO QUERIES ON LIGHTHOUSES, &c.

- I. The whole coast of Sweden is under a director, and is divided into three districts, each under an officer of the rank of lieutenant colonel, who has under him a certain number of sub-districts in charge of officers of the rank of lieutenants. Their duties are, the maintenance of the lights and marks, and the general superintendence of the service. There is also a certain number of engineers for building and repairing the lighthouses, and furnishing drawings, plans, &c., to the lighthouses, as well as to other buildings. All are subject to the Board of Admiralty alone.
- II. All expenses are paid by the state, which levies a light duty on shipping. The cost of the whole service of Sweden in 1858 was as follows:—
Maintenance of lights, 46 in number £2,000
" of buoys and beacons - 1,000
- III. A list of lighthouses is annexed, distinguishing sea and harbour lights, and fixed, revolving, and others.
- IV. There are no particular principles. New lights are established according to circumstances.
- V. See reply No. III.
- VI. Three keepers are stationed on single and five on double sea lights, and two on harbour lights. Head keepers receive 50*l.*, second 33*l.*, and third 25*l.* for the year, with an allowance of fuel and candles.
- VII. No particular principles.
- VIII. See reply No. III.
- IX. No colours are used.
- X. No particular principles.
- XI. See list of lights.
- XII. The French lenticular lights made by M. H. Lepaute are preferred.
- XIII. See the accompanying table.
- XIV. No particular principles.

- XV. In the north part of the Gulf of Bothnia, where fogs are frequent, the highest light is about 171 feet above the water.
- XVI. A single central funnel and ventilators in the wall.
- XVII. Rape oil, costing about 3*s.* 6*d.* a gallon.
- XVIII. No other method used.
- XIX. Contracts by tender are made, when practicable; but if the tenders are too high the work is done by Government by the above-mentioned engineers. On the whole, the latter mode is found to be the best. Contract work is always directed by a Government engineer. Illuminating apparatus is sometimes obtained abroad. Painting and small repairs are done by Government. Stores are contracted for by tender.
- XX. Oil is tried by chemical examination.
- XXI. No particular periods or preferences.
- XXII. No particular principles as to lights or beacons; but starboard and larboard buoys are painted red and white respectively, and it is proposed to alter the latter to black.
- XXIII. The district commander makes a proposal to the general director, who submits it to the Crown, by which the required funds are ordered. The same officer makes all necessary experiments for trying lights.
- XXIV. A barometer, thermometer, and tidepole are furnished to all lighthouses, and an anemometer to fifteen.
- XXV. There are no regular tides in Sweden; the currents are sometimes very strong, but their force is not ascertained.
- XXVI. Lightships and some of the lighthouses are provided with large bells, which are rung in thick weather every five minutes.
- XXVII. Starboard buoys are painted red and larboard buoys black. All shoals or dangers are marked by poles of 10 feet high above the water; those on the starboard side, with a northerly or easterly course, are fitted with a broom at the top of the pole.

Remarks.—Such lights from which greater power of light is required are provided with French "lenticular apparatus," whereas the rest, as harbour lights, &c., are fitted with parabolic or sidereal reflectors.

TABLE.

- Showing—1st. The price of the illuminating apparatus used, which is to include in one sum the cost of the optical and mechanical portions of each description and character used.
- 2d. The estimated annual cost of ordinary repairs, in which are to be included glass cylinders, wear and tear, and cleaning stores consumed.
- 3d. The consumption and cost of oil and wicks consumed in a hundred hours. The cost of oil to be estimated at forty-pence the gallon.

N.B.—If any extraordinary repairs can fairly be expected to recur periodically, they are to be stated separately, unless they are previously given under the head of wear and tear.

BJURÖKLUBB. Catadioptric. 1 Burner.	Price	-	-	-	Fixed.	1,500 <i>l.</i>
		Oil	{ Consumption	-	-	150 gallons.
	{ Cost		-	-	32 <i>l.</i>	
	Wicks	-	Consumption	-	-	12 yards.
Price		-	-	-	Fixed, 250 <i>l.</i> Lighted during 1858 from April 21st to December 20th.	
HOLMÖ GADD. Parabolic. 14 Burners.	Oil	{ Consumption	-	-	175 gallons.	
		{ Cost	-	-	36 <i>l.</i> 7 <i>s.</i>	
	Wicks	-	Consumption	-	26 dozens.	
	Price	-	-	-	Fixed and flashing. 500 <i>l.</i>	
WINGA. Catadioptric. 1 Burner.	Oil	{ Consumption	-	-	80 gallons.	
		{ Cost	-	-	17 <i>l.</i>	
	Wicks	-	Consumption	-	6 yards.	
	Price	-	-	-	Revolving. 600 <i>l.</i> Lighted during 1858 from April 27th to the end of the year.	
ÖRSKÄR. Parabolic. 12 Burners.	Oil	{ Consumption	-	-	230 gallons.	
		{ Cost	-	-	48 <i>l.</i> 3 <i>s.</i>	
	Wicks	-	Consumption	-	23 dozens.	
	Price	-	-	-	Flashing. 25 <i>l.</i>	
SVART- KLUBBEN. Parabolic. 1 Burner.	Oil	{ Consumption	-	-	55 gallons.	
		{ Cost	-	-	11 <i>l.</i> 10 <i>s.</i>	
	Wicks	-	Consumption	-	9 dozens.	
						4 0 2

MARSTRAND. Parabolic. 16 Burners.	Price	-	-	-	Revolving.	600l.	
		Oil	-	-	-	Consumption	- 450 gallons.
	Wicks		-	-	-	Cost	- 93l. 10s.
NÄSKUBBEN. Sideral. 1 Burner.		Price	-	-	-	Consumption	- 31 dozens.
	Oil		-	-	-	Fixed.	11l.
		Wicks	-	-	-	Cost	- 33 gallons.
			-	-	-	Consumption	- 7l. 4s.
			-	-	-	Consumption	- 4 dozens.

	Swedish Feet.	Number of Lighthouses.	Illuminating Apparatus.						Classification.			Lights as seen Miles.
			Lenses.			Reflectors.			Sea.	River.	Harbour.	
			2 Order.	3 Order.	4 Order.	Parabolic.		Sideral.				
						Fixed.	Fixed Flashing.					
Malören -	80	1	-	-	-	-	-	1	-	-	-	12
Bjuroklubb -	171	1	1	-	-	-	1	-	-	1	-	20
Stora Fjäderägge -	104	1	-	-	-	-	14	-	-	1	-	16.5
Holmo Gadd -	72	1	-	-	-	-	1	-	-	1	-	14.6
Brädman -	101	1	1	-	-	-	1	-	-	1	-	16.3
Stor Yungfruv -	83	1	-	1	-	-	-	-	-	1	-	15.6
Äggegrund -	58	1	-	-	-	-	-	1	-	1	-	13.3
Björn -	42	2	-	-	-	-	-	2	-	2	-	12.3
Örskär -	123	1	-	-	-	-	-	12	-	1	-	17.2
Djarsten -	67	1	-	-	-	-	8	-	-	1	-	14.3
Understen -	81	1	-	-	-	-	10	-	-	1	-	15.1
Swartklubben -	70	1	-	-	-	-	-	3	-	1	-	14.4
Näskubben -	22	1	-	-	-	-	-	-	1	-	1	10.2
Söderarna -	102	1	-	-	-	-	-	6	-	1	-	16.4
Grönskär -	114	1	-	1	-	-	-	-	-	1	-	17
Korsö -	115	1	-	-	-	-	-	2	-	-	1	17
Landsort -	148	1	-	-	-	-	-	9	-	1	-	18.8
Gottska Sandön -	140	2	-	2	-	-	-	-	-	2	-	18.4
Färö -	103	1	-	-	-	-	-	12	-	1	-	16.5
Östergarn -	104	1	-	1	-	-	-	-	-	1	-	16.6
Haburg -	195	1	-	-	-	-	-	12	-	1	-	20.8
Ölands Norra Udde -	106	1	-	1	-	-	-	-	-	1	-	16.7
Grimskär -	42	1	-	-	-	-	-	-	1	-	1	12.3
Ölands Södra Udde -	136	1	1	-	-	-	-	-	-	1	-	18
Utklyfran -	51	1	-	-	-	-	-	6	-	1	-	13
Ystad -	52 & 20	2	-	-	-	-	-	-	2	-	2	13 & 10
Falsterbo -	80	1	1	-	-	-	-	-	1	-	-	15.1
Malmö -	50	1	-	-	-	-	-	-	1	-	1	12.9
Landskrona -	38	1	-	-	-	-	-	-	1	-	1	11.9
Helsingborg -	30	1	-	-	-	-	-	-	1	-	1	11.1
Kullen -	297	1	-	-	-	-	-	12	-	1	-	24.6
Morups Tange -	98	1	1	-	-	-	-	-	-	1	-	16.1
Nidingen -	63	2	-	2	-	-	-	-	-	2	-	14.3
Böttö -	46	1	-	-	-	-	-	-	1	-	1	12.6
Buskär -	84	1	-	-	-	-	-	-	1	-	1	15.4
Elfsborg -	46	1	-	-	-	-	-	-	1	-	1	12.6
Winga -	90	2	-	-	-	-	-	-	-	2	-	15.7
Marstrand -	290	1	-	1	-	-	-	16	-	1	-	24.4
Hällo -	122	1	-	-	-	-	-	9	-	1	-	17.5
Koster -	220	2	-	1	1	-	-	-	-	2	-	21.8
Sum		46	5	10	2	-	-	-	29	9	8	-
FLOATING LIGHTS:												
Finngrundet -	38	1	1	-	-	-	-	-	1	-	-	12
Falsterbo ref. -	50	2	2	-	-	-	-	-	2	2	-	12.9

Stockholm, Fyringenjör Contoret, December 1859.

G. VON HEIDENSTAM,

Öfen Fyringenjör.

REPLIES TO QUERIES ON FLOATING LIGHTS.

- I. a. } The ship is built after a drawing received
- b. } from England last year, considered the best.
- c. }
- d. A mushroom anchor, 36 cwt., 1½ inch chain.
- e. Single anchor, mushroom, 36 cwt., 100 fathom chain.
- f. Lantern of 8 reflectors, by Mr. W. Wilkins, London.
- g. At the masthead, the mast going through it.
- h. See Mr. W. Wilkins' book on "Lantern for fixed lights."
- II. a. "Finngrundet," moored near the shoal of that name.
- b. Oak.
- c. Twelve miles.
- d. Jib, foresail, lugg on the main, and trysail on the mizen.

- e. Two bower anchors and chains.
- f. A large bell and two guns.
- g. Two whaleboats.
- h. Master, two mates, and five men.
- i. Not relieved.
- j. Six months, or from the time when the ice breaks up to winter setting in.
- k. 100 gallons oil in four months.
- III. a. 1,500l.
- b. 780l.
- c. 3,500l.
- d. 36l.
- e. None yet.
- f. Cannot yet be ascertained.
- g. Master, 70l.; mate, 40l.; seaman, 30l.
- h. 50l. for every six months.
- IV. There are no instances on record of floating lights being off their stations.

5.—HANOVER.

Hanover, 19th September, 1859.

In answer to the letter of the 20th May last, and with reference to my preliminary letter of the 25th ultimo, I have the honour to forward herewith to the British Envoy Extraordinary and Minister Plenipotentiary, George John Robert Gordon, Esq., the answers of the Royal Director General of Waterworks, to questions made relating to the lights, buoys, and beacons, with enclosures.

The Royal Director General of Waterworks has given the answers in conformity with the questions, but has not furnished the requested drawings of the best Hanoverian lighthouse, as no drawings of the old lighthouse at Borkum exist, nor could its construction be of any interest for the case in question; also because the lighting apparatus has been constructed according to the Fresnel system known in England. With the light on the "Knoeck" it is the same.

I avail myself of this opportunity to renew the assurance of most distinguished respect.

(Signed) PLATEN HALLERMUND.

The British Envoy Extraordinary,
&c. &c.

LIGHTS, BUOYS, AND BEACONS.—(GENERAL RETURN.)

I. The lights are attended to by some guards. The buoys and beacons are put up by appointed officials (experienced pilots). Both are under the direct inspection of the respective inspectors of waterworks, who stand under the higher inspection of the director general of waterworks. The latter is finally answerable to the minister of finances and commerce.

II. Funds for the maintenance of the lights, buoys, and beacons, and the stationary sea-marks (kaapen) on the East Friesian Islands are obtained out of the grants made by the Royal Ministry for Finances and Commerce for every official year from 1st July to 30th June.

The amount of such grants averages 10,150 thalers (1,522l. 10s.)

There must be added the renewal of the seven sea-marks (kaapen) (which takes place at an average every 20 years), the expenses of which average 1,200 thalers (180l.) a piece, accordingly, 420 thalers (63l.) per annum.

The total annual expense is, therefore, 10,570 thalers (1,585l.)

III. a. Lighthouse on the island of Borkum.

b. Light on the mouth of the Ems, near the "Knoeck."

c. Four separate lanterns for lighting the Harburgh Elbe navigable water.

IV. General principles have not been laid down on account of the small extent of the Hanoverian coast.

V. Ditto, no classification. (Vide III.)

VI. Two keepers for the lighthouse at Borkum, the first receiving 207 thalers (31l. 1s.) salary, and free lodgings, the second 175 thalers (21l. 5s.) salary.

The attendance to the lanterns at the Harburgh navigable water costs 183 thalers (27l. 9s.)

VII. Vide No. IV.

VIII. All the lights are fixed.

IX. All the lights are white ones.

X. As stated in IV.

XI. The lights at Borkum and on the "Knoeck" are catadioptric ones, according to the Fresnel system. They have been put up about one year ago in the room of the catoptric lights, because they afford a stronger intensity to the light and an important saving in oil.

The lighting of the Harburgh navigable water is effected by the common hydrocarburet lamps.

XII. The known Fresnel construction, executed by the civil engineer Veit Meyer, of Berlin.

XIII. Has been done—vide the enclosed table.

XIV. Vide IV.

XV. The greatest height allowable for lighthouses is not fixed, because the Hanoverian coasts and islands are flat. The Borkum lighthouse is 139½ feet above the common high flood. The light can be seen at a distance of 20 to 40 sea miles.

XVI. The ventilation is done by copper tubes over the glass cylinder.

XVII. On the lighthouse at Borkum, and on the "Knoeck," purified rape oil is used, and in the lanterns at the Harburgh navigable water hydrocarburet.

XVIII. No other method is used for producing light.

XIX. Contracts by public tender only adopted for some articles. The inspector of waterworks notes each single supply of articles.

XX. The inspector of waterworks convinces himself by ocular inspection of the stores.

XXI. The buoys are annually painted with oil colour. The stationary sea marks (kaapen) on the East Friesian Islands annually with black tar.

XXII. The buoys are painted white and black to distinguish the two different sides of a navigable track. The buoy farthest at the entrance of navigable water is put up in a straight line with two stationary marks, and is coloured red. No other general principles govern the selection of colours.

XXIII. The director general of waterworks himself, or by his direction, the inspector of waterworks inquires into new proposals, and decides thereon, reserving the approval of the minister for finances and commerce.

XXIV. None at hand.

XXV. Ditto.

XXVI. Ditto.

XXVII. Drawings cannot be furnished.

a. The Borkum lighthouse is an old four cornered church tower, built of bricks, with wooden stairs.

b. Two stairs under the lighting apparatus is the oil store.

c. Two different lamps are alternately used. One with weights, the other with hydraulic pressure.

d. On account of the short time since being established, the annual cost of maintenance cannot be stated.

e. The illuminating apparatus of the Borkum lighthouse has cost 14,000 thalers (2,100l.)

f. The cost of the whole construction cannot be stated.

XXVIII. The hitherto used buoys are made of oak, in the known shape. The mooring is done with stones of 10 to 20 square feet measure, and iron chains.

Experiments are being made with iron buoys.

XXIX. Vide IV.

XXX. None of peculiar form used.

The casks are of a somewhat oblong form, flat at the top.

The buoys are pointed at both ends.

The stationary sea marks (kaapen) are pyramidal structures, made of hard wood, with four sides, and 40 to 80 feet high, costing 700 to 1,800 thalers (105l. to 270l.)

XXXI. Instructions for the lamp keepers on the Borkum lighthouse, and at the light on the "Knoeck," also those of the superintendent of buoys and beacons are herewith enclosed. Other instructions have not been issued.

TABLE OF PRICES.

		1. LIGHTHOUSE AT BORKUM. Fresnel Lamp. Light,	
		2nd Class.	
Price	-	-	14,000 thalers (2,100l.)
Ordinary repairs	-	-	1s still new.
Oil	-	{ Consumption	- 3,089 lbs. per annum.
		{ Cost	- 250 lbs. = 45 thalers (6l. 15s.)
Wicks	-	{ Consumption	- 26 cils of wicks per annum.
		{ Cost	- 15 thalers, 18 gr. per annum (2l. 6s. 9d.)
		2. LIGHT ON THE "KNOECK." Fresnel Lamp. Light,	
		6th Class.	
Price	-	-	700 thalers (150l.)
Ordinary repairs	-	-	New.
Oil	-	{ Consumption	- 530 lbs. per annum.
		{ Cost	- 25 lbs. = 45 thalers (6l. 15s.)
Wicks	-	{ Consumption	- 6 cils of wicks per annum.
		{ Cost	- 1½ thalers per annum (1. 6d.)

6.—H A M B U R G.

INFORMATION from HAMBURG relative to LIGHTS, BUOYS, and BEACONS in the UPPER DISTRICT.

- I. The information under this head is given in the report of Commander Abendroth. The beacon near Schulau is under the direction of the inspector of the arsenal.
- II. As stated by Commander Abendroth.
- III. The lights in the Upper District are, one beacon near Schulau, and two lightvessels, one of which lies near Schulau, the other opposite the river Lühe.
- IV. V. As stated by Commander Abendroth.
- VI. One keeper is employed for the beacons near Schulau. His salary is 350 marks (21*l.*), with an allowance for house rent.
- VII. As stated by Commander Abendroth.
- VIII. Fixed lights.
- IX. As stated by Commander Abendroth.
- X. No general principles are laid down.
- XI. Common lamplights.
- XII., XIII., XIV. —
- XV., XVI., XVII. As stated by Commander Abendroth.
- XVIII. No other method is used.
- XIX. *a.* The illuminating apparatus at Schulau has been made by the city architect. The building lightvessels and making buoys has been done by contract.
- b.* Common lamps.
- c.* Are obtained from the arsenal.
- d.* Are purchased at Hamburg.
- XX. The stores are tested when bought by the inspector of the arsenal.
- XXI. Painting is done as often as it is considered necessary.
- XXII. The lightvessels are painted red, and the beacon near Schulau is painted white. The buoys are painted white, designating the north side of the navigable channel, and black, designating the south side of the navigable channel.
- XXIII. As stated by Commander Abendroth.
- XXIV. No meteorological observations are made.
- XXV. No system is adopted.
- XXVI. A bell is rung on board the lightvessel.
- XXVII.—XX. No drawings can be furnished.
- (Signed) G. C. BERNDT,
Inspector of the Arsenal.

- XII., XIII., XIV. —
- XV. The whole coast is flat.
- XVI. There is an opening in the roof of the lighthouse, and the lanterns are ventilated partly from within, partly from without.
- XVII. Rape oil well cleansed.
- XVIII. No other method is used.
- XIX. *a.* Since 1815 the house for a beacon has been built by the city architect. The lightvessels are built by contract, and the buoys are made on the same system. The beacons are made by the city architect.
- b.* The apparatus for the beacons have been furnished by Sautter & Co., of Paris, and the illuminating apparatus for the light vessel lately built was furnished by contract.
- c.* The painting is done by the city architect.
- d.* The stores are bought at Hamburg.
- e.* —
- XX. Should the stores prove bad in use they are sent back to Hamburg.
- XXI. Painting is done when necessary. The buoys are painted twice a year, and the colour of the lightvessel is kept in good state.
- XXII. The colour of the lightvessels is red; two of the lighthouse and beacon at Newwerk, black. The buoys are painted black and white, red with a white border, black with a red border, and the buoys to show wrecks are painted green.
- XXIII. Improvements and new arrangements are discussed and agreed to by the Committee for Harbours and Navigation.
- XXIV. Meteorological observations are only made occasionally if specially ordered.
- XXV. No system is adopted.
- XXVI. A bell is rung on board the lightvessels, or guns are fired. The lighthouses are too distant from the navigable channel to allow warning signals to be heard by the ships.
- XXVII.—XXX. Drawings cannot be furnished.
- (Signed) E. ABENDROTH,
Commander and Inspector of Pilots.

HAMBURG.

FLOATING LIGHTS in the UPPER DISTRICT.

INFORMATION from HAMBURG relative to LIGHTS, BUOYS, and BEACONS.

- I. The lights, buoys, and beacons are under the jurisdiction of a board named the Committee for Harbours and Navigation.
- The lights and buoys are under the direction of the commander and inspector of pilots.
- Those in the Upper Elbe are under the direction of the inspector of the arsenal.
- The maintenance of the lighthouses and lightvessels is under the direction of the architects of the above named committee.
- II. The functionaries of the Committee for Harbours and Navigation prepare an estimate of the necessary funds; and, if approved by the committee, this estimate is placed in the State budget.
- III. The lights in the lower district are (on shore), the lighthouse at Cuxhaven, a beacon and two lighthouses at Newwerk, and three lightvessels. In the upper district (see other report).
- IV. Lighthouses are built, and lightvessels provided, should any necessity be shown.
- V. Lights are not classified.
- VI. Two keepers are always employed for each lighthouse, and one for each beacon. The salary of a keeper at Cuxhaven is 650 marks (39*l.*), and of a keeper of a beacon 600 marks (36*l.*), with an allowance for house rent and fuel. The salary of a keeper at Newwerk is 600 marks (36*l.*), and he is allowed some ground for his own cultivation.
- VII. No general principles are laid down.
- VIII. The light at Cuxhaven is the only revolving light, and the same is used seaward.
- IX. None of the Hamburg lights are coloured.
- X. No general principles are laid down.
- XI. The lighthouses at Newwerk have seaward two rows of reflecting lights, but in general but single ones are used. There is a similar arrangement at the lighthouse of Cuxhaven. The beacon is a "Fresnel" of the fourth

(The Hamburg authorities have given no answer to Question I., *a* to *k*.)

- II. *a.* Hamburg has two lightvessels in the Upper District, namely, No. 1, "The Schulau," which lies near Schulau; and No. 2, "The Lühe," which lies opposite the River Lühe.
- b.* Oak.
- c.* About four English miles.
- d.* One mainsail and one foresail.
- e.* One anchor, with a chain of 40 fathoms.
- f.* A bell, which is rung in foggy weather.
- g.* Each vessel has a small boat on board.
- h.* In summer two, in winter three men.
- i.* Never.
- j.* If nothing particular should occur, both vessels are sent to port every two years, in order to have their bottoms cleaned, and make other repairs.
- k.* About 400 lbs. of oil and 24 dozen of which for each vessel.
- III. *a.* 3,000 marks each vessel (180*l.*)
- b.* 250 marks each vessel (15*l.*)
- c.* 4,600 marks each vessel (276*l.*)
- d.* About 155 marks each vessel (9*l.*), inclusive of wicks.
- e.* About 20 marks each vessel (2*s.*)
- f.* 2,200 marks annually (132*l.*)
- g.* Captain, 65 marks per month (4*l.*), and of the seamen, one is engaged for the year, at the rate of 40 marks a month (2*l.* 8*s.*) and the other for four months at the same rate (2*l.* 8*s.*) a month.
- h.* About 10 times every year, on account of ice. Owing to this circumstance the vessel may leave and return to her station the same day, but this depends entirely on the state of the ice within the navigable channel.

(Signed) G. C. BERNDT,
Inspector of the Arsenal.

HAMBURG.

FLOATING LIGHTS.

(The Hamburg Authorities have given no answer to Question I., a to k.)

II. a. Hamburg has three lightvessels in this, the so-called "Lower District," namely:—No. 1, the "Caspar;" No. 2, the "Neptune;" and No. 3, the "Ernest."

THE "CASPAR."

- II. a. The "Caspar," lies at the mouth of the Elbe.
- b. Oak.
- c. The light is 45 feet above water.
- d. Three gaffsails, several jib and top sails.
- e. Four anchors, 2 of 15 cwt., 2 of 12 cwt.; 2 chains, $\frac{1}{2}$ of 120 fathoms, and 1 chain $\frac{1}{2}$ of 120 fathoms.
- f. Marngot's signals, guns, and bell.
- g. None. Answer:—None can be used, owing to the exposed situation of the vessel.
- h. Two officers and nine men.
- i. Every fortnight one officer and two men get leave to go on shore. At times, when ice is making, both officers and also a pilot are on board.
- j. Once a year the vessel puts into port to have her bottom cleaned.
- k. 2,800 lbs. oil, and for 10 marks (12s.), wicks.

- III. a. Unknown.
- b. About 2,400 marks (144l.)
- c. Marks 70,000 (4,200l.)
- d. About 2,500 lbs., and a trifle for wicks.
- e. About 100 marks (6l.)
- f. 12 to 13,000 marks annually (720l. to 780l.)
- g. Captain, 162½ marks, 9l. 15s.; mate, 90 marks, 5l. 5s.; seamen, 51 to 34 marks, 3l. to 2l. a month.
- h. Marks 2,500 (150l.)

VI. a. On account of ice the "Caspar" was off her station, 1857, 5th to 7th January, 1st to 24th February; 1855, 21st to 24th December, 1856, not off the station; 1857, 3rd to 5th February; 1858, 24th February to 8th March.

THE "NEPTUNE."

- II. a. The "Neptune" lies in the Elbe as a "leading mark" at the point where formerly the navigable channel was separated into two branches.
- b. The vessel was built of iron in 1858.
- c. The "Neptune" has two lights, one 45 feet, the other 30 feet above water. Both lights are fixed to the same mast.
- d. Three gaffsails, and several jibsails. All lightvessels are fitted with like sails.
- e. Three anchors; 2 of 15, and 1 of 12 cwt.; 2 chains $\frac{1}{2}$ of 120 fathoms; and 1 chain $\frac{1}{2}$ of 120 fathoms.
- f. Marngot's signals, guns, and bell.
- g. The vessel is provided with good boats.
- h. Two officers and nine men.
- i. Every fortnight one officer and two men get leave to go on shore. At times, when ice is making, both officers and also a pilot are on board.
- j. Once a year the vessel puts into port to have her bottom cleaned.
- k. About 4,000 lbs.

- III. a. Unknown.
- b. An old illuminating apparatus is used on board the "Neptune."
- c. Marks 60,000 (3,600l.)
- d. About 4,000 lbs., and a trifle for wicks.
- e. About 150 marks (9l.)
- f. 13 to 14,000 marks annually (780l. to 840l.)
- g. Captain, 120 marks (7l. 2s.); mate, 90 marks (5l. 5s.); seamen, 44 to 32 marks (2l. 13s. to 2l.) a month. The seamen have some extra earnings.
- h. Marks 3,600 (216l.), inclusive of provisions for the pilots.
- VI. a. Only on account of ice.

THE "ERNEST."

- II. a. The "Ernest" lies at the upper end of the Nordergott, at the point where vessels must alter their course.
- b. The vessel was built of oak.
- c. Thirty feet above water.
- d. Three gaffsails, and several jib and top sails.
- e. Three anchors; two of 8, and one of 7 cwt.; one chain, $\frac{1}{4}$ of 90, one $\frac{1}{2}$ of 120, and one $\frac{1}{8}$ of 120 fathoms.
- f. Marngot's signals, guns, and bell.
- g. Good boats.

- h. Two officers and eight men.
- i. Every fortnight one officer and two men get leave to go on shore. At times, when ice is making, both officers and also a pilot are on board.
- j. About a year the vessel puts into port to have her bottom cleaned.
- k. About 2,000 lbs.
- III. a. Unknown.
- b. Marks 2,300 (138l.)
- c. Marks 45,000 (2,700.)
- d. About 2,500 lbs., and a trifle for wicks.
- e. A very trifling sum.
- f. 10,000 to 11,000 marks annually (660l. to 660l.)
- g. Captain, 120 marks (7l. 2s.); mate, 90 marks (5l. 5s.); seamen, 51 to 34 marks (3l. to 2l.) a month.
- h. Marks 2,400 (144l.)

VI. a. On account of ice the "Ernest" was off her station, 19th December 1855, to 24th January, 1856; 1857, 8th January to 20th January, 28th January to 31st January, 1st February to 8th February; 1858, 11th February to 14th February; 21st February to 8th March. Sometimes the mooring chains broke, but the vessel was again at her station within 24 hours afterwards, so that otherwise she left her station only on account of ice.

(Signed) E. ABENDROTH,
Commander and Inspector of Pilots.

BREMEN.

INFORMATION FROM BREMEN, RELATIVE TO LIGHTS, BUOYS, AND BEACONS.

The questions are only answered in so far as they relate to the arrangements adopted at Bremen. To simplify the report, merely the number of the question, to which the answer is given, is stated.

1. There is, about four German miles (about 20 English) below Bremerhafen, on a sandbank, called the "Hohe Weg" (High Road), a massive lighthouse; and two German miles (10 English) further in sea, at the mouth of the Weser, there is a lightvessel; and, lastly, there is a lighthouse situated at the entrance of the great basin at Bremerhafen, to show the entrance to the harbour.

These different lights are under the jurisdiction of a committee, composed of members of the senate and of the bürgerschaft, and named "Committee for Harbours and Navigation."

The senior member of the senate belonging to this committee is the president, and a member of the bürgerschaft takes charge of the accounts. The buoys and beacons which mark the entrance to the Weser are under the superintendence of the Chamber of Commerce.

II. The necessary funds are furnished by the State, of which funds an estimate is proposed by the above-named committee. The expenditure amounted in 1853 to:—

	Rix-	dol.	groten.	£
For maintaining the light-house	4,948	66	825	
For maintaining the light-vessel	3,699	19	617	
For the buoys and beacons in the Weser	9,018		1,503	

The costs for the light at the entrance to the harbour of Bremerhafen cannot be given separately; they amount to about 100 rix-dollars (17l.)

III.—V. The light of the lighthouse is a catoptric light, of the fourth class of "Fresnel;" that of the light-vessel a garland of lamps.

VI. Four keepers are employed for the lighthouse, with a yearly salary of 1,080 rix-dollars (180l.), exclusive of provisions.

The crew of the lightvessel consists of nine men, inclusive of the captain; the wages of the same amount to 1,824 rix-dollars (304l.) yearly.

VII.—VIII. The light of the lighthouse is a fixed light, and 100 feet above the water.

IX. The light of the lighthouse is a white light, and a smaller light, designating the direction of the navigable channel to Bremerhafen, is red.

X.—XVI. Are answered by the above statement.

XVII. Refined rape oil is used.

XVIII.—XIX. The lighthouse and the lightship have been built by contract, but under the control and in conformity with the drawings and directions of the Government engineers.

The catoptric light of the lighthouse is contracted for; and the provisions for the lighthouses and the lightvessel are furnished for a certain sum agreed for every year. The buoys are made by the State authorities.

XX. The provisions for the lighthouse are tested by the chief keeper, and those for the lightvessel by the captain, and payment is made, but on their written certificate that the provisions are good, both in quality and quantity.

XXI. The painting is generally renewed every year.

XXII. The lightvessel is painted red, to distinguish it from other vessels.

XXIII.—XXIV. There are only thermometers and barometers on board, and their variations are regularly registered by the keeper.

XXV. No system is adopted.

XXVI. By ringing a bell.

XXVII. The lighthouse is a thoroughly massive building, at the top of which is the glazed cupola.

FURTHER PARTICULARS.

a. Bricks and clinkers.—The lower story so far as the highest flood can reach is built of freestone.

b. In the store-room of the tower.

c. Vary considerably, according to circumstances.

Cost of maintenance in 1858:—

d. The wages of the 4 keepers amount to six dollars 30, 24, 18, and 18 a month, or 5*l.*, 4*l.*, 3*l.*, and 3*l.*

	Rix dol.	£
Provisions	1080	0
Cost of illuminating (oil)	847	6½
Ordinary cost of maintenance	406	68
For contingencies	662	22
	726	59
	3723	71
		620

The other expenses in 1858 were for repairing the foundation of the tower, which had been damaged by a flood higher than usual.

e. The cost for the illuminating apparatus, including the fitting up the same, amounted to 11,981 dollars (1897*l.*)

f. The total costs for the lighthouse, inclusive of the illuminating apparatus, amounted to 65,978 dollars 41 groten (10,996*l.*)

XXVIII.—XXXI. Are not answered, owing to the simple arrangements adopted for the Weser.

FURTHER REMARKS.

An ice signal is used at the lighthouse; namely, on an iron bar or rod, about two thirds of the height of the lighthouse. One large ball is hoisted up to indicate that the Weser, as far as Bremerhafen, is full of ice, but not so much as to prevent a vessel sailing up with due caution. But two balls are hoisted up should there be so much ice in the navigable channel as to prevent any vessel reaching the harbour.

The communication from Bremen and Bremerhafen with the lighthouse, that is situated two German miles (10 English) from the shore, is by means of an electro-magnetic and submarine telegraph. The lighthouse communicates with vessels at sea by Marryatt's signals, and by these means any vessel in passing the lighthouse can convey to or receive information from Bremen or Bremerhosen.

BREMEN.

FLOATING LIGHTS.

Question I.—a to h.

The lightvessel "Bremen" is a galliot, painted red, drawing about eight to nine feet water, with two masts, and is moored by two anchors, which are joined by a chain, to which chain the vessel is made fast. The rings of the chain are about two inches English in diameter. The illuminating apparatus is a garland of lights, fixed up to the top of the mast.

Question II.—a to k.

The name of the lightvessel is "Bremen," which lies at the mouth of the river Weser. The light is seen at a distance of 12 to 14 English miles; the sails are those of a galliot. The vessel has a reserve of chains and anchors on board, and several boats, which may also be used to keep up the communication with the lighthouse. The crew are nine men, inclusive of the captain; they are relieved every three months. The vessel remains at her station until ice compels her to leave it. In case of repairs she is replaced by a reserve vessel lying at Bremerhafen. The yearly consumption of oil is about 2,500 lbs.; in 1858 it was 2,401 lbs., costing 365 rix dollars 65 groten (61*l.*), and wicks, five rix dollars (17*s.*)

Question III.

a. The hull costs 8,425 rix dollars (1,404*l.*)

b. The illuminating apparatus cost 500 rix dollars (84*l.*)

c. The total cost of the vessel, with inventory, illuminating apparatus, &c., is 15,383 rix dollars 25 groten (2,564*l.*)

d. The cost for oil and wicks was, in 1858, 370 rix dollars 65 groten (62*l.*)

e. The costs for repairing the illuminating apparatus vary considerably, but they never exceed a trifling sum.

f. The annual expenditure in maintaining the floating lights and the illuminating apparatus amounted to,—

	Rix dol.	gr.	£
In 1851	4,108	17	685
1852	3,094	38	516
1853	3,309	41	552
1854	4,291	41	715
1855	5,440	20	907
1856	3,343	32	557
1857	5,590	48	932
1858	3,659	19	616
	32,877	43	5,480

Or, on the average annually, to - 4,110 0 - 685

g. The wages of the men are:—

	Rix dollars.	£	s.
Captain, per month	40	7	0
Mate	20	3	10
Carpenter	18	3	0
Cook	14	2	7
5 Scamen	each 12	2	0
	Or 60	10	0

h. The annual cost of provisions is - 1,110 - 185 0

Question IV.

The lightvessel "Bremen" has gone twice to Bremerhafen for repairs within the last five years, and the reserve lightvessel, the "Weser," took her station. The station has, therefore, only been left for a short time, when large masses of floating ice prevented the vessel to keep her moorings.

7.—S P A I N.

ANSWERS to the Questions put by the Royal Lighthouse Commissioners appointed in England.

I. The system of administration, which is in force in Spain with respect to lighthouses, buoys, and beacons, is identically the same as that of France. They form part of the especial branch of public works, and depend like the latter on a general board of direction established at the department of public works. There is also attached to the said direction a permanent commission composed of engineers of superior rank of the corps of roads, canals, and ports, and of chiefs of the same rank belonging to the Royal Navy, who are always consulted, when it is intended to modify or vary the general plan of lighting, or to establish some new light, as also upon any system of beacons, in which cases they determine the site or place in which they are to be situated, their height above the level of the sea, and the distinctive character and appearance which they must possess in order to avoid their being confounded one with another.

In all else, the construction and establishment of this class of works, as well as their preservation, appertain to the engineers of the said corps, who are distributed in the provinces; and they and the works are usually visited at stated periods by their immediate superiors, who are other engineers, with the title of inspectors, and who form the superior class of the corps. The duties, therefore, and powers of the said individuals, their responsibility to each other and to the Government are entirely analogous to those which are established in France.

With regard, however, to the lighting and beacons of the coasts of Spain, the captains of ports are under the necessity of watching their effects and of communicating the observations they may make to the engineers, and also, if they think it necessary, to the chiefs of the marine department, so that their recommendations may be so effective as to secure the adoption of every improvement which may be necessary.

II. In the 99th page of the plan of lighting, the general law is inserted, in virtue of which a special tax is collected, the product of which is to be applied to the service of lighting the coasts; but the revenue thus derived enters at once into the public treasury, and the amount of the liabilities of each year, whether for new works, or for materials for the maintenance, lighting, and service in general are met by drafts on the credits opened by the budget of the state.

The revenue derived from the lighthouse tax appears in the appendix, chapter 5, page 25, table No. 101; the ordinary expenses in table No. 102, and the expenses for new buildings in No. 104 of the report.

III. See the plan of lighting, page 86 of the report; appendix to chapter 5, table 92.

IV. See the general plan, 13th and following pages.

V. Do. do.

VI. See regulations for the tower keepers (appendix 2, page 101 of the same plan).

VII. See the plan of lighting.

VIII. Do. do.

IX. See table No. 92.

X. See the plan, 13th and following pages.

XI. See the plan.

XII. See the plates of the plan. The makers are Mr. Sautter and Mr. Lepaute, established in Paris.

XIII. A complete return is being made of all the articles used in each lighthouse. When it is finished a copy shall be forwarded.

XIV. See the plan of lighting.

XV. See the plan of lighting. The observations of the appendix 2, page 185.

XVI. For the ventilation of the lanterns, it has been found that the arrangements adopted by the French builders answer sufficiently well.

XVII. The best olive oil, which generally comes from Andalusia and all the other provinces on the coasts of the Mediterranean and the Balearic Islands, is used for lighting.

XVIII. No other means are used, nor has there been any attempt to employ other means of lighting.

XIX. As the organization of the general maritime system of lighting is of a comparatively recent date, no con-

tracts have been made by public auction, excepting for the building of the edifices, and even some of them have been constructed by the administration for want of bidders. The furnishing the oil has also been contracted for, for the greater number of lighthouses; but so far (excepting in a few cases) for each one separately. It is possible that in course of time a greater number of lighthouses may be included in one contract, and that the supplying collectively the greatest possible number of establishments may be productive of economical results. The lantern apparatuses and the principal supply of objects not made in Spain have been contracted for with Parisian makers.

XX. In order to be certain of the quality of the oil, it is ascertained whether it fulfils the conditions provided for in the deed of contract. The said conditions and the proofs to which the oil is submitted are mentioned in the appendix to the instructions for lighthouses at the end of the plan of lighting, page 142.

XXI. The lighthouses have been painted whenever their proper maintenance and appearance required it; but owing to the recent formation of this branch of the public service, there has not been sufficient time to fix the periods at which the paint ought to be renewed.

The same remark applies to the buoys and beacons.

XXII. For the above reason an exact answer cannot be given to this question.

XXIII. The branch of the service relating to the lighthouses and beacons of the coasts of Spain, being in course of organization, it can only be said in answer to this question, that according to the experience already obtained, all the regulations of the plan adopted fulfil their object, and that, nevertheless, endeavours are being made to study any improvement which may perfect it in any of its parts; so much so that to make sure of the result care is taken to ascertain what is the opinion of the corporations and persons most interested and competent in the matter, and, finally, the proper suggestions are made by the commission mentioned in No. 1.

XXIV. See the plan of furniture, of which copies are transmitted, and the forms for meteorological observations.

XXV. These signals have not yet been established.

XXVI. Do. do.

XXVII. Two projects are enclosed.

XXVIII. See the general plan for beacons.

XXIX. Do. do.

XXX. Do. do.

XXXI. See the plan for lighting.

Note.—Maritime lighting is recent in Spain, and the system of beacons has not yet begun to be in force, as the buoys are only now in course of construction. For both these reasons some of the questions cannot be answered as much in detail as is wished, but this will cease to be the case before long, as complete statistical returns are being prepared which will show the annual cost of all the articles in each lighthouse, and the expenses and observations to which the system of beacons shall have given rise. A report will be published every year on the state of public works similar to the accompanying one, in which will appear all the suggestions which the service to which it refers may offer; and by this means the British Commission will be enabled to keep themselves informed, as to all that passes in Spain, in the department of public works.

Madrid, February, 1, 1860.

DEPARTMENT OF PUBLIC WORKS.

General Board of Direction.

List of the furniture and utensils which the lighthouses of the coasts of the Peninsular and adjacent Islands are to contain, drawn up by the Commission of this branch of the service in conformity with the orders of the general Board of Direction of Public Works on the 16th January last.

To form a general plan of the furniture, utensils, and other objects which the lighthouses ought to contain, it would be necessary to examine and make a special study of each of the edifices which now exist, and this would lead to a want of uniformity, which is precisely what it is intended

to avoid; in order, therefore, to group and classify them, it appears most convenient to take into consideration the different parts of which each edifice should consist, and to ascertain in each of them the number, class, and quality of the objects which they ought to contain. All the objects can be classed in two groups; 1st, the utensils and furniture necessary for the conservation, repair, and daily complete service of the apparatus. 2nd, the furniture, utensils, and other objects necessary to supply the edifices, so that its employés and guards may be able to reside and remain constantly in them, in order to the due performance of the service required.

The former effects are contained in the 79th and 82nd articles, inclusive of the instructions of May 21, 1851, for the better fulfilment of the regulations for tower-keepers of lighthouses; and, as experience has confirmed the advantages and necessity of these articles of furniture when employed in combination with the principal deposits which were ordered to be established by the Royal Order of May 16, 1857, no modification should be made respecting them; but the list furnished by the said instruction should be at once adopted.

With respect to the latter class of effects, which form the subject of this list, the following observations must be borne in mind:—

The buildings of which the lighthouses are composed must possess; 1st, a vestibule; 2nd, a storehouse; 3rd, a cleaning room; 4th, apartments for the tower-keepers; 5th, apartment for the engineer, or for repose.

According to the class, situation, and importance of the lighthouse, each of these divisions will undergo modifications as regards their dimensions, and one of them may even be suppressed, or two of them united under certain circumstances. According to the regulations in force there will be three tower-keepers in the lighthouses of the first and second class, two in those of the third and fourth class, and one in those of the fifth class and in other lights, and an assistant keeper may be added when circumstances require it; in each of these cases, therefore, the necessary objects shall be furnished to each keeper according to their numbers and the room they may be in each edifice.

Each of the five parts of which each lighthouse is to be composed shall contain, with a view to the object for which they are destined, as follows:—

1st, vestibule—two wooden benches with backs, painted with oil; 2nd, the storehouse—a large pine table properly strengthened at one of its extremities, and arranged so as to receive a vice which may serve for filing, cleaning, and putting in order the pieces of the apparatus when necessary, two small benches, one bascule, one press with an upper and lower division, two receptacles for oil.

3rd, cleaning-room—one large pine-wood table, two benches, one press with an upper and lower division, two chairs, one desk, an aneroid barometer, a thermometer, a pluviometer, one clock.

4th, apartment for one tower-keeper—one chest of drawers, six chairs, one brazier, one inkstand, a lamp, a spittoon, an iron bedstead and clothes-rack, a mattress, two pillows, a straw mattress, a wash-hand stand with a complete service of jug, basin, and chamber utensil; kitchen utensils composed of two frying-pans, a pair of tongs, one shovel, a trevet, a skimmer, a copper saucepan, a large spoon, a dust-bin a water-jug, a coffee-pot, a soup-tureen, 12 common plates, six soup plates, a salad-bowl, four cups and saucers, four chocolate plates, two salt-cellar, four glazed earthen pots of different dimensions for cooking, a cruetstand, four bottles for wine, four tumblers.

5th, apartment for the engineer and for repose—a writing table with drawers, a desk, a lamp, a glass, six chairs, a press with an upper and lower division, two mahogany frames for the plans of the edifice, two pairs of sheets, an iron bedstead and clothes-rack, two flock and one straw mattresses, two pillows, four pillow cases, one coverlet, two blankets, one night table, a wash-hand stand with a complete service of jug, basin, and chamber utensil, a small looking-glass with a mahogany frame, one tablecloth, four napkins, two towels, china and glasses for four persons, six plated spoons and forks, six knives, and a large spoon.

In order that the utmost uniformity may be preserved in the arrangement of these effects, the following rules will be observed:—

1st, In each lighthouse the dimensions of the furniture and utensils for each apartment, as also the kind of wood to be used, shall be regulated by the size of the edifice.

2nd, The presses shall consist of two divisions, the upper one with glass and the lower with wooden doors. The latter, as well as those of glass, shall slide instead of being on hinges, and the upper division shall be provided with linen curtains.

3rd, In the lower division of the press in the storehouse all the linen not in use shall be kept, as well as all the clean linen which is to be used during the following week; and in the upper part all the furniture, utensils, and spare pieces

which may not be in daily use, and which form the first group above referred to.

4th, The following articles shall be placed in the press of the cleaning room; in the upper part, every thing which is in daily and constant use for the preservation of the apparatus, the inventory books, and those for noting the observations made each day as above directed; and in the lower part all the dusters and cloths for cleaning purposes which may be in use for the week.

5th, A copy of the general plan of maritime lighting, approved by Royal Decree of the 13th September 1847, and of the regulations and instructions for the better accomplishment of the same shall be kept in either of the presses of the warehouse or cleaning room.

6th, In the press in the engineer's room, the bed and table linen, and the china and glass, shall be kept while not in use; and the plans, books, and other documents composing the archives, shall be kept on one of the shelves of the upper compartment.

Approved by Royal Order of June 30, 1858. The Director General, RAMON DE ECHEVARRIA.

Observations

Which are to be borne in mind in filling up the accompanying return:—

1st, The engineers will be careful to teach the tower-keepers properly, so that the observations may be made with precision and exactitude, and the notes may be placed in their respective columns.

2nd, The observations shall be made at midnight, 6 a. m., noon, and 6 p. m.

3rd, The state of the sea shall be notified in its proper column under the following heads,—smooth, white horses, some sea on, long swell, ground swell, rough, high sea, and heavy sea.

The word "very" may be used when necessary, or two of the above adjectives may be united in certain cases.

If the direction of the sea is different from that of the wind, the quarter whence it comes shall be specified.

4th, The state of the wind shall be classified under the following denominations,—calm, catspaws, light wind, slight breeze, freshish breeze, fresh breeze, strong breeze, half-a-gale, whole gale, and a hurricane.

The word "very" can be prefixed when considered necessary, and the quarter from which the wind blows must be specified.

Note.—This return was accompanied by:—

1st, Two well-executed drawings of the lighthouses at Las Islas Cebretres, and La Isla de Mouro.

2nd, A report from the office of public works at Madrid, 1857.

3rd, A copy of the general plan for the maritime illumination of the coasts of Spain, 1858.

The last two being bound copies.

The Commission have had the advantage of conversing with Señor Lucio del Valle, engineer to the Spanish Lighthouse Board, and have obtained from him, on the 9th of April, 1860, the following additional information in reply to the circular forwarded to the Spanish Government:—

Réponse à l'Interrogatoire de la Commission Royale des Phares et des Balises.

I.—Le Gouvernement fait par lui même tout ce qui se rattache au balisage et à l'éclairage maritime.

Pour s'informer de toutes les questions il y a deux corporations; 1ère, la Commission des Phares, composée d'Officiers supérieurs de la Marine Royale et d'Inspecteurs du Corps Royal des Ponts et Chaussées; 2e, le Conseil des Ponts et Chaussées, formé des ingénieurs du grade le plus élevé.

Ces deux Conseils dépendent du Ministre de Fomento (travaux publics).

Le 1er s'occupe de l'emplacement du phare et de la détermination de la classe et de l'ordre de l'appareil; le 2d entend dans tout ce qui se rattache au projet et au devis de la tour, qui est formé par l'ingénieur ordinaire, et examiné par l'ingénieur en chef du Département.

Ces deux ingénieurs dirigent la construction de la tour et le montage de l'appareil, et après que le phare est éclairé ils exercent l'inspection sur le service de la lumière et sur les gardiens (keepers), (Torres).

II.—D'après la loi du 11 Avril, 1849, tous les bateaux à l'entrée des ports d'Espagne doivent payer l'impôt des phares, qui est comme suit.

Les bateaux Espagnols 1 real de vellon (2.40 peniques) par tonne.

Les bateaux étrangers 2 rs. de vn. (4.80 peniques) par tonne.

Ces droits ont produit dans l'année 1858 :—

	rs.	livs. star.
Bateaux espagnols	781,337	= 7,513
Bateaux étrangers	746,595	= 7,465
	<u>14,978</u>	

III.—On voit dans le Livre des Phares, page 86, la note exacte et détaillée de tous ceux qui existent en Espagne, et aussi de tous ceux qu'on doit encore établir pour compléter le plan d'illumination.

IV.—L'emplacement des phares doit être dans les caps les plus avancés dans la mer, où l'angle de l'horizon éclairé soit le plus grand possible.

Si le terrain est élevé sur le niveau de la mer, ça sera bon pour économiser de l'argent dans la construction de la tour, qui sera alors plus petite.

En Espagne il n'y a pas de feux flottants. On reconnaît son utilité dans de certaines circonstances, mais si on peut les remplacer par des tours fixes, soit en pierre, soit en fer, ce sera mieux pour le service.

V.—Deux classes : Phares et fanaux.

Les premiers, sont les grandes lumières qui s'établissent sur les principaux endroits du littoral pour faire connaître au navigateur le point où il se trouve.

Les seconds, sont les petits phares de localité pour marquer l'embouchure des fleuves, l'entrée des ports, &c.

VI. Dans les phares de 1er et de 2me ordre avec des appareils à feu fixe, 2 gardiens.

Id. id. à feu tournant, 3 gardiens.

Dans les phares de 3me et 4me ordre avec des appareils à feu tournant, 2 gardiens.

Dans tous les autres phares, 1 gardien.

Les gardiens sont de 1ere, 2me, et 3me classe, avec le traitement de

14 reales vellon = 2,80 schellings.

11 reales vellon = 2,20 id.

8 reales vellon = 1,60 id.

On leur donne un appartement pour demeurer avec leurs familles dans la même tour.

On donne à chaque gardien $\frac{1}{2}$ livre d'huile par jour pour ses besoins particuliers.

Ils ont droit à une pension de $\frac{1}{2}$ jusque $\frac{3}{4}$ schelling par jour, lorsqu'après un certain nombre d'années ils se sont inutilisés par le service ou par age.

Tous les gardiens étudient dans une école spéciale établie près du grand phare de 1er ordre de Machichau.

Si on veut plus de renseignements, on peut examiner dans la page 101 du Livre des Phares le Règlement des Gardiens, dans la page 111 l'Instruction qui facilite l'intelligence du Règlement, et dans la page 181 le Règlement de l'Ecole pratique des Phares.

VII. Les feux de la plus grande portée sont, d'après ce que j'ai déjà dit, pour les caps les plus principaux et les plus avancés ; dans les points intermédiaires du littoral on établit les appareils d'ordre inférieur.

Les apparences de tous les feux doivent être variées soigneusement pour ne pas confondre les uns avec les autres.

VIII. La lumière peut être,

1°. Fixe.

2°. Tournante.

La lumière tournante (revolving light) peut se disposer de deux manières :

1°. Avec des éclipses ou des petites interruptions du feu.

2°. Par l'apparence du feu fixe combiné avec des éclats (flashing) de temps en temps.

Cette description fait connaître parfaitement les diverses apparences qu'on peut donner au feu tournant, en changeant la durée des éclipses et des éclats, soit par le nombre des panneaux de verre, soit par la vitesse du mouvement de rotation de l'appareil, soit enfin par l'ensemble de ces deux moyens.

IX. X. Les verres colorés font perdre à peu près $\frac{1}{3}$ de l'intensité de la lumière. C'est pour cela qu'on ne les emploie que dans certains cas particuliers pour marquer parfaitement les phares, mais alors il faut toujours combiner le feu coloré avec le feu blanc ou naturel.

Dans les fanaux ou petits feux locaux, comme la portée de la lumière n'a pas l'importance que dans les phares, on peut employer les verres colorés sans aucun inconvénient et même avec des avantages pour distinguer beaucoup mieux le fanal.

La couleur générale des verres est rouge et quelquefois verte.

XI. On a adopté en Espagne le système lenticulaire de Fresnel, dont les avantages sur l'ancien système catoptrique sont bien remarquables :

1° Les appareils de réflexion ne peuvent pas donner un si grand nombre d'apparences différentes dans la lumière, comme y a besoin pour l'éclairage d'une certaine partie du littoral, parce que la durée des éclipses ne peut être diminuée qu'en augmentant la vitesse du mouvement, ce qui produit l'inconvénient de faire plus petite la durée des éclats. Si on augmente le nombre des lampes autour de l'axe de rotation cet inconvénient disparaît en effet, mais alors il en résulte un autre plus grand encore, celui de la diminution de la portée de la lumière à cause des miroirs métalliques étant trop petits.

2° Dans les appareils à réflecteurs la lumière se distribue inégalement sur l'horizon, puisque quelle que soit la disposition des miroirs paraboliques il y aura toujours un feu plus vif dans la direction de leurs axes respectifs que dans tout le reste. Cette différence est un inconvénient dans les phares à feu fixe.

3° Les réflecteurs absorbent une certaine quantité de lumière, ils salissent, et on ne peut pas les nettoyer sans altérer le poli de leur surface et le brillant nécessaire pour la réflexion.

4° Tous les rayons lumineux qui ne tombent pas sur les surfaces des miroirs sont complètement perdus pour l'observateur qui se trouve dans la mer un peu éloigné du phare.

Les avantages du système lenticulaire ou catadioptrique sont :

1° Un plus grand nombre de combinaisons de la lumière pour distinguer les appareils les uns des autres.

2° La distribution de la lumière se fait également sur tous les points de l'horizon éclairé.

3° Avec les panneaux dioptriques centraux, et avec les prismes catadioptriques inférieurs et les supérieurs qui constituent la coupole de l'appareil on profite la plupart des rayons qui sortent du foyer lumineux formé de mèches concentriques, et par conséquent, malgré la perte de lumière qu'il y a pour traverser les verres, l'intensité du feu dans les phares lenticulaires est plus grande que dans les autres appareils.

4° D'après les expériences photométriques une seule lampe de quatre mèches concentriques produit le même effet que 22 mèches d'Argand. Dans la direction de l'axe des lentilles l'effet de la lumière est égal à 4,400 mèches de cette même classe.

5° La consommation de l'huile n'est pas si grande que dans les appareils à réflecteurs.

XII. Mr. Lepaute et Mr. Sautter, de Paris. Ces deux fabricants ont construit jusqu'à présent tous les appareils employés en Espagne, mais le Gouvernement en demandera aussi quelques-uns à la fabrique anglaise de MM. Chance, Brothers, and Co., près de Birmingham.

On peut voir les dessins des appareils dans la page 200, et les suivantes, du Livre des Phares.

XIV. Dans un même ordre la portée d'un phare varie avec la classe de l'appareil (page 194, du Livre des Phares), par conséquent lorsqu'on étudie le plan général de l'éclairage on ne doit pas oublier cette circonstance dans la distribution des appareils sur le littoral, en choisissant ceux de la plus grande portée pour les points les plus intéressants.

XV. La hauteur de la lumière sur le niveau de la mer varie avec l'ordre et la classe de l'appareil et aussi avec la hauteur de l'observateur.

Il y a dans le livre (page 185), un mémoire où on traite scientifiquement cette question, et on peut voir les tables des hauteurs dans de différentes circonstances.

XVI. On voit dans les dessins la disposition donnée à la coupole de la lanterne pour obtenir l'issue de l'air chaud.

XVII. C'est l'huile d'olives de première qualité et très bien filtrée qu'on emploie dans les phares d'Espagne.

XVIII. Il n'y a aucune autre méthode de produire la lumière.

XIX. Les édifices des phares sont faits par des entrepreneurs, d'après les projets formés par l'ingénieur et approuvés par le Gouvernement.

On fait l'adjudication des travaux à celui qui présente la proposition la plus favorable aux intérêts de l'état.

On a adopté le même système d'adjudication pour l'approvisionnement de l'huile et pour le service du petit bateau qui doit transporter périodiquement l'eau, les vivres, le combustible, &c., lorsque le phare est établi dans quelque île séparée de la côte.

On achete les appareils chez les constructeurs de Paris, d'après les prix réglés d'avance entre l'administration et les fabricants.

Les méthodes qu'on vient d'indiquer ont réussi parfaitement, et elles sont les plus économiques.

XX. On justifie tous les frais au moyen des documents signés par les personnes qui donnent les élets.

On prend note de tout ce qu'on emploie dans chaque jour pour connaître ainsi les existences, et pour pouvoir faire le contrôle quand le phare est visité par l'ingénieur ou quelqu'un de ses subordonnés.

XXI. Les tours sont généralement en pierre de taille, dont la couleur est blanche.

Dans les bouées on emploie les couleurs rouge, noire, et blanche.

XXII. Pour distinguer les bouées les unes des autres on dispose la peinture soit en forme des parallèles, soit en méridiennes, soit enfin par des carreaux résultants de la combinaison des deux lignes de courbure qu'on vient de dire.

XXIII. On a déjà dit que la Commission des Phares et le Conseil des Ponts et Chaussées sont les deux Corporations consultées par le Ministre des travaux publics dans toutes les affaires de l'éclairage et du balisage.

XXIV. Dans les grands phares les gardiens font tous les jours quatre observations météorologiques avec le thermomètre et le baromètre. Il y a aussi un pluviomètre.

XXV. On n'a rien résolu encore sur cette question.

XXVI. Il n'y a rien dans les phares.

Dans les bouées on emploie la cloche, ayant adopté pour cela les bouées du Capitaine Peacock, et celles de l'embarcadere de la Mersey.

XXVII. Je n'ai pas ici les dessins des tours, mais je donnerai quelques renseignements :

a. On peut employer dans la construction de la maison quelque fabrique, mais pour la tour il faut choisir un bon matériel, spécialement lorsqu'elle doit être très-élevée. La pierre de taille, les moellons réglés, et la brique, sont les matériaux les plus usuels.

b. Les magasins de l'huile sont établis dans le rez-de-chaussée dans des caisses en fer ou en fer blanc. La quantité d'huile est connue par la profondeur, de manière qu'il est facile de faire le contrôle.

c. On trouve dans le livre la note détaillée de tous les effets d'approvisionnement. (Page 72 et suivantes.)

d. L'argent employé par an dans l'éclairage, service, et conservation de chaque phare est, terme moyen :

	livs. sterl.
Phare de 1er ordre	- 340
2me	- 280
3me	- 140
4me	- 120
5me	- 103
6me	- 103

Si on désire plus de détails on les trouvera dans le livre. (Page 72 et suivantes.)

e. Les prix des appareils, terme moyen, sont comme suit :

	livs. sterl.
1er ordre { Feu fixe	- 2370
{ Feu tournant	- 2890
2me { Feu fixe	- 1550
{ Feu tournant	- 1800
3me { Feu fixe	- 850
{ Feu tournant	- 1200
4me { Feu fixe	- 320
{ Feu tournant	- 420
5me { Feu fixe	- 250
{ Feu tournant	- 320
6me { Feu fixe	- 200

f. Les frais de construction des phares varie beaucoup naturellement d'après les circonstances. Voici les prix de revient d'un certain nombre, les appareils et tous les frais compris :—

	livs. sterl.
1er ordre { Cap de Peñas	- 4000
{ Estaca de Vares	- 5310
{ Cap de Finisterre	- 5182
{ Cap de Sn. Sebastian	- 7611
{ Iles Cies	- 5633
{ Cadix	- 2420
2me ordre { Cap de Sn. Antoine	- 2491
{ Pointe du Llobregat	- 4203
3me ordre { Sn. Sebastian de Guipurcoa	- 1879
{ Cap de Busto	- 2050
{ Cap Prior	- 2424
{ Corrado	- 2028
{ Ile Fabarca	- 3310
{ Cap de Creux	- 7080
{ Pasages	- 1112
{ Pointe de la Galea	- 1500
{ Iles Sisargas	- 1639
4me ordre { Ile Salvora	- 845
{ Ile Arosa	- 671
{ Cartagena	- 806
{ Cap de Huestas	- 1138
{ Cap la Higuera	- 622
5me ordre { Cudillero	- 451
{ Cap de Santa Pola	- 680
{ Castro Sordiales	- 524
6me ordre { Tijon	- 705
{ Villajoyosa	- 644

XXVIII. On voit dans la seconde partie du Livre des Phares tout ce qui se rattache aux bouées, et l'on accompagne aussi les dessins des modèles adoptés par le Gouvernement espagnol.

La plupart des bouées sont en fer. Elles sont fabriquées à Londres chez MM. Brown, Lenox, et Cie., qui sont aussi les constructeurs des bouées pour le Trinity House.

Pour assujettir les chaînes on fait usage de corps morts en fonte ou en pierre de taille, en leur donnant le poids convenable.

On emploie aussi les vis de Mitchell (screw) dans les bouées très grandes et dans celles qui servent pour assujettir les bateaux. Ce système est plus cher que les corps morts et même que les ancras, mais il est préférable par l'énorme résistance de la vis enfoncée dans le terrain.

Les prix de nos bouées dans les ateliers de Millwall, sont comme suit :—

	livs. sterl.
Bouée A	- 115
Bouée B (grand modèle)	- 310
Bouée B (petit modèle)	- 135
Bouée C	- 157
Bouée D	- 63
Bouée E	- 95
Bouée F	- 52
Bouée F f	- 28
Bouée H	- 55
Bouée H h	- 6 10 0

XXX. Dans le livre on trouvera les dessins de tous les modèles ajoutés en Espagne.

XXXI. On trouve aussi dans le même livre les règlements et tous les documents dont on fait usage pour le service.

Londres, le 20 Mars, 1860.

LUCIO DEL VALLE,

Inspecteur du Corps Royal des Ponts et Chaussées, Membre de la Commission des Phares, d'Espagne, &c. &c.

Residence, Madrid, Calle de Valverde, No. 23.

8.—FRANCE.

MEMORANDUM of the DOCUMENTS accompanying the Note sent in reply to the Questions proposed by the Royal Commission of Lighthouses and Buoys of England.

Number of Order.	Designation of the Documents.
I. PRINTED WORKS.	
1.	Description of the lighthouses lit on the coasts of France on the 15th of August 1855.
2.	Regulations for "gardiens."
2,3.	Instructions sur le service des phares et des fanaux.
3,4.	Reply to claims made relative to the invention of lenticular apparatus.
4.	Detail estimatif du service de l'éclairage.
5.	"Cahier des charges" for the supply of colza oil.
6.	Agreement made with a van contractor for the transport of (all belonging to) the service.
2. DRAWINGS.	
7,8.	Lenticular apparatus of the 1st order.
9.	Lenticular apparatus of the 2d order.
10.	Apparatus of the 3d order (small pattern) and of the 4th order.
11, 12, 13.	Lamp flames of the various orders.
14.	Tide signals of the coasts of France.
15.	Phare des Héaux de Bréhat.
16.	Phare de Calais.
17, 18.	Phare des Baleines.
19.	Phares de la Canche.
20.	Phare de la Grande Ile Sanguinaire en Corse.
21.	Phare de Kermorvan.
22.	Tower for harbour light.
23.	Frame work in wood for directing harbour light.
24.	Cast metal lamp stand for harbour lights.
25.	Lighthouse keeper's house with <i>fanal</i> (small light).
26.	Buoy "en tôle."

Paris, June 26, 1860.

(Signed) L'Inspecteur Général des
Ponts et Chaussées,
Directeur du Service des
Phares et Balises.

REYNAUD.

Notes in reply to the Questions proposed by the Royal Commission on the Lighthouses and Buoys of England.

I. Administrative organization.

A note was sent on this subject on the 22nd of February 1858, to Lord Clarence Paget. The undersigned is informed that it has been transmitted to the Royal Commission, and to it he refers.

(The following is a translation of that portion of the paper referred to which relates to this subject.)

NOTES on the organization and the expense of the lighthouse and beacon, (*Balisage includes buoys and beacons, &c.*) service of France.

Organisation of the Service.

The centralization of the service of lighthouse and beacons dates from the national convention. These establishments belonged to local corporations, and a law of the 15th February 1792 united them amongst the duties assigned to the Ministry of Marine, but charged the Ministry of the Interior with the execution of the works. An imperial decree of the 7th March 1806, changed this service to the Ministry of the Interior, and afterwards to the administration of roads and bridges; but it prescribed a concerted action between the two offices of the French Admiralty and Home Office for establishments to be created, and this disposition gave birth to the Commission des Phares (Lighthouse Commission). Instituted in 1811, this commission was composed in the beginning of three naval officers, three members of the Institute, and three general inspectors of roads and bridges. The commission has now an extra member, and is composed as follows:—

His Excellency the Minister of Agriculture, of Commerce, and of Public Works, President, in whose absence the commission is presided over by one of its members. Messieurs Mathieu, retired rear-admiral, director-general of naval stores, member of the bureau of longitude; Jurien de la Gravière, rear-admiral; Choppart, captain; Reibell, inspector-general of roads and bridges and naval works; Garnier, inspector-general of marine engineering; Leonor Fresnel, retired inspector-general of roads and bridges,

former secretary to the commission; Begat, hydrographer-in-chief to the Admiralty; Mathieu, member of the academy of sciences, and of the bureau of longitude; Dupréy, member of the academy of sciences; Leonce Reynaud, inspector-general of roads and bridges, director of the service of lights and buoys, and secretary to the commission.

The commission of lighthouses is called on to decide (subject to the approbation of the minister) on all questions relative to the establishment of lighthouses and beacons, &c., in all that relates to maritime interests. To it belongs the organization of the system of lighting the coasts of France, the application of lenticular apparatus invented by its first secretary, Augustin Fresnel, and the programme of works to be executed for marine beaconage (buoys, &c.)

The general-inspector secretary of the commission is charged with the direction and supervision of the service of light's and beacons, &c. That direction includes two distinct kinds of business.

1st, the establishment of illuminating apparatus and works belonging thereto, their repairs and all stores, such as wicks, chimnies of glass, &c., which are sent from Paris into the departments.

2d, the execution of all the works of construction of lighthouses, beacons, buoys, and sea-marks, and the service of keeping up the lighting and beaconing, (*that is of marking danger otherwise than by lighthouses*).

The director is assisted in works of the first category by an engineer of the French Board of Works, (pouts, &c.) and four conductors resident at Paris.

The other works are included in the duties of the engineers of maritime departments.

In each one of these departments there is an engineer-in-chief, several ordinary engineers, conductors, and inferior agents of the administration. The service of lights and beacons constitutes a part more or less important of the duties entrusted to these agents.

Commencement of Works.

When the establishment of a new light (fire) is demanded by mariners, or by a commercial corporation, or by the engineers of the département, the affair is submitted to the commissioners of lights, who examine if there is ground for considering the demand, and, in case the reply be affirmative, determine the position, the range (for distance), and the character to be assigned to the light. If the documents submitted to the commission do not appear to be sufficient for forming an opinion, the engineers of the département are invited to complete them, and they often institute on the spot a naval commission chiefly composed of mariners and pilots, which is charged to study the different questions of which the preliminary solution is deemed necessary. The work (report) of this commission, with the opinions prepared by the chief engineer and the prefect of the département, is transmitted to the Commission of lights, who decide on it, taking into consideration the importance of the navigation, the nature of the dangers to be pointed out, and the estimated amount of the expense of the first establishment of the service.

The inspector-general secretary of the commission then draws up the programmes of two projects for consideration, the one for the construction of the edifice, the other establishing the illuminating apparatus, and he submits them both for the approbation of the minister, together with the opinion of the light commission.

There is no instance of refusal of approbation by the minister. The first of these programmes are directed to draw up the engineers of the departments who are directed to draw up a regular and complete plan (project) of the work to be executed conforming themselves to the conditions imposed on them. This project is subsequently submitted to the examination of the inspector-general who addresses his report to the minister. If any part of the project includes nautical questions the Lighthouse commission is again consulted. In the contrary alternative or after these questions have been decided, the project and the report are submitted to the General Council of roads and bridges, which is the assembly competent to decide on all that belongs to the science of constructions. Another simultaneous inquiry takes place, together with the one of which mention has just been made and has for its object to make sure if the projected constructions (works) are not of a nature to exercise an evil influence on the defences of the country. Conferences are set on foot with this object between

the civil and military engineers of the locality, and the mixed commission of public works which sits at Paris gives on the questions in dispute an opinion on which the ministers decide.

When the project submitted has been approved, with or without modification, it is sent back into the department to be entered as a decision in whole or in part, and to be executed under the direction and surveillance of the engineers and their agents. The works which are of a certain importance are visited in course of construction by the inspector-general.

While the edifice is being constructed, the illuminating apparatus is also being constructed in the workshops of Paris, and is mounted and tested at the establishment of lighthouses.

It is sent to its destination as soon as the works are finished, and one of the conductors of the central service is sent to the spot to proceed with its installation and to instruct the keepers. The new lighthouses are announced to mariners before they are lighted. The delay to be observed between the announcement and the lighting of the new lights, as well as the degree of publicity to be given, are regulated in each case by the importance of the light and its chance of being confounded with any other. The system of lighting the coast of France is also brought to the knowledge of mariners by a chart of lights and by a little book. The editions of this book were formerly renewed each year, but they now succeed each other at longer intervals since the modifications in the lights which are generally important, have become more rare. (A copy of one of each of these documents is annexed to the present note.)

II.—THE EXPENDITURE IN 1858:—

The expenditure in 1858 for the service of lighthouses and buoys amounts to 1,200,000 f. and may be divided as follows:—

Expense of maintenance and great repairs of coast lights (<i>phares</i>) and port lights (<i>fauxes</i>), imprints, experiments, &c.	781,440
New works	218,560
Maintenance of buoys and beacons	110,000
New works	90,000
Total	1,200,000

The allowances of engineers and conductors attached to the lighthouse service are not included in this amount.

The majority of these officers are entrusted at the same time with other works emanating from the office of public works, and it would be difficult to estimate that part of their remuneration, which may be considered applicable to the service in question.

III. List of lighthouses lit on the coasts of France.

There is attached to the present note (annexed No. 1.) the description of the lighthouses lit on the coasts of France on the 15th of August 1855.

A new edition of this document is now being printed, and a copy will ultimately be transmitted to the Royal Commission.

IV., V., VII., VIII., XI., XIV., XV. Questions relative to the general principles which govern maritime illumination.

The undersigned believes that he should join these questions so as to avoid repetition, and comply more effectually with the wishes of the Commission.

Distribution of Lighthouses.

Lighthouses (*phares*) were formerly placed at the entrance of ports, or at the mouths of rivers open to maritime navigation. There are none of these at the present day. These points are habitually distinguished only by lights of secondary importance, and the principal lights are carried elsewhere, to places where they are required to be of more service.

It is, in fact, on nearing the coasts that the most formidable dangers exist, and, consequently, it is the seaboard above all which it is important to indicate to the navigator.

So if a light is established on each one of the capes which projects furthest to sea, or on the little island which forms its prolongation seaward, and if these lights are joined two and two, they will occupy the angles of a polygon circumscribed about all the dangers, and they indicate the coast from as great a distance as the elevation and power of the illuminating apparatus permit.

Such a relation should also be observed in the range and divergence of the lights that the navigator cannot approach the coast without having at least one light within his view. In other words, the distance which

separates two angles of the polygon should be less than twice the range.

Those lighthouses, which are particularly required to indicate the seaboard, constitute "*les phares de grand atterrage*," these are the lights which require the greatest power,—these are the lights of first order.

After having indicated the approach to dangers, it is necessary to give the means of arriving at the destination while avoiding them. This is attained by lighting other lights of less range in the larger or smaller bay which is comprised between two lights of the first order. There are points, such as islands, reefs, sand banks, or capes of which it may interest the navigator to know the position. There are straight channels which it may be useful to mark out, and the power of the light to be lit in these places ought to vary with the distance at which it may be necessary to observe it, while the lights of the first order ought to send their rays on all the sea horizon which they command. Some of these last lights may concentrate theirs into an angular space, more or less confined.

Finally, the navigator having been thus conducted to the proximity of the port towards which he is directing his course, there remains but a feeble light to be placed at the end of one of the piers to show him the entrance of the channel.

The general principles just stated cannot be applied rigorously. The peculiarities of an extended seaboard are too various to permit the arrangement of its illumination according to an absolute formula.

Thus, beyond the sides of the ideal polygon, of which the lights of the first order occupy the angles, an island may be met with or a sand bank which it is essential to mark; and a light of secondary importance should perform this service.

On the coasts of France, for example, the Seven Isles are beyond the line which joins the first order lights of Héaux de Bréhat and Ile de Bas, and there there is placed a light called of the third order.

It is the same in the case of l'Île Vierge between the lights of l'Île de Bas and Ouessant. Sometimes also the configuration of the coast does not admit of the approach of two lights of the first order to the points where their lights may cross, and the interval which separates them is closed by a secondary light. This is what is done at the lights of Belle Ile and of l'Île d'Yeu, between which is placed a pile light, and at the lights of Agde and Faranin, between which the light of Aigues Morte has been placed.

Orders of Lighthouses.

The range adopted for the lights of the first order varies from 20 to 27 miles, according to the character they exhibit. That of other lights varies between much more extended limits, because the circumstances are more various. It is comprised between 18 and 2 miles. These last lights are divided into several classes and orders, according to their power. The number of these inferior orders has been fixed at three by the French Administration, as shall be explained below.

Characters of Lighthouses.

These lights, if multiplied, might expose navigators to fatal mistakes, if means had not been discovered to vary their appearance, in such manner that it was easy to avoid confounding them. This resource was not available when the light of lighthouses was produced by the combustion of wood or coal, at all events the only one which was available consisted in grouping several fires on the same spot. It was certainly very limited and very expensive, but the happy invention of Augustin Fresnel came to increase the power of the apparatus and give the means of diversifying their character as much as may be required.

It is above all for the lights of the first order, and for those which at certain points fulfil with them the duty of great coast lights, that it is of importance to have the appearance very distinct, so that the navigator may be duly informed of his position before approaching the coast, and may rectify the error in his reckoning. It is not necessary moreover that each of these lights should have a special character. It is sufficient that the distance preserved between each kind should exceed the error of position which may have been committed under the ordinary circumstances of navigation.

It is doubtless not easy to fix a limit for this error, nevertheless the Commission des Phares has thought that it might admit that a navigator should not deceive himself as to his real position more than about 85 miles, except in extraordinary cases, and after circumstances which call for the greatest caution at the moment of making the land.

Warned of his approach to the shore by the light which he may have within his view, he should not endeavour to make the port during the night, if there be any doubt in his mind.

Moreover, it is to be observed that the mistake which may take place when only one light is in sight, cannot avoid discovery the moment when either one of the neighbouring great sea lights, or one of the secondary lights placed in the same neighbourhood, shall appear.

This consideration has even allowed the neglect of the limit just mentioned.

Thus the first order fixed lights of the Ile de Groix and of the Ile d'Yeu are only distant 72 miles, but the first cannot be seen on the same bearing as the second without at the same time noticing the eclipsing light, with half minute intervals, of the point of Penmarc'h,—of the light varied by flashes of the Isle of Penfret,—or of the eclipsing light, with minute intervals, of Belle Ile en Mer, and even almost always two of these.

These considerations induced the Commission des Phares in the programme arranged by it in 1825, on the report of the Admiral de Rosel, to allow only three different characters for the lights of the first order: fixed light, revolving light, of which the obscurations recur at intervals of a minute, and a light eclipsing every half minute.

A fixed light should always be placed between two eclipsing lights of different intervals.

Nevertheless, experience having proved that navigators do not always take sufficient note of the difference observed between the intervals of the eclipses in the revolving lights of which mention has just been made, and, on the other hand, the lights having been multiplied beyond what was foreseen in 1825, the necessity has been recognized of admitting a larger number of characteristic distinctions.

One of them belongs in some measure to the infancy of the art, and which having been adopted at the end of the last century for one of our most important sea lights, that of Havre, was maintained on that point by the programme of 1825. It consists in placing two fixed lights beside each other, at such a distance that they do not mingle within their range, and show from all points as a well marked group.

This character has, without doubt, the inconvenience of requiring a double expenditure, but it has the merit of being clearly distinctive.

Moreover, several are found on the coasts of England.

It was adopted in France to point out from the offing the dangerous coast at the approaches to the mouth of the Canche, and to illuminate the coasts of the Gulf of Gascony, in the interval comprised between the light of Cordouan and that of Cape Ferret at the entrance to the basin of Arcachon.

Another character, which had been at first reserved for the lights of the second and third order, has been ultimately applied to lights of the first order. That is, the fixed light varied by flashes succeeding each other every three minutes or four minutes, that is to say, at intervals sufficiently long to prevent the possibility of confounding them with ordinary eclipsing lights. This has been chosen for the lights of Calais and the Ile de Sein, and at Porquerolle, so as to avoid all possible mistake between these lights and those in their neighbourhood.

Finally, the colouring of light has been called in in certain circumstances to determine a distinctive character. It had been rejected in the first instance absolutely, and in fact it presents inconveniences which should lead to its employment only with great reserve.

On the one hand it reduces the intensity of the light in a very great proportion, and, on the other, atmospheric conditions occasion at times accidental colouring, which might give occasion to mistakes as to the colour of the light, but it has been admitted, as it will be seen below, that these objections had not always the weight attributed to them, and yielding to the pressing request of the navigators, the Commission des Phares has admitted red colour first for the lights of inferior order, afterwards for the flashes of the lights of the first order. It thought that there could be no serious objection to colouring the flashes of varied lights red, because these flashes are not required to increase the range, but to characterize the nature of the light. Instead of varying by the intensity it varies in some sort by colour, and the coloured light being placed in contact with the white light preserves its relative value, so as to be distinguishable even in foggy weather.

The red colour has been adopted in preference to all others as being the most advantageous in every way.

This important subject will be referred to again further on. Let it suffice to say at present, that the first order light of Fatouville, at the mouth of the Seine, consists of a white fixed light, varied every three minutes by red flashes, and that the Commission des Phares has lately proposed

to replace the existing illuminating apparatus of the light at Biarritts by a light of which the flashes following each other every 20 seconds shall be alternately white and red, and to place on the new lighthouse which is to indicate the western extremity of the Isle of Ouessant a light of the same kind, but in which two white flashes alternate with a red flash.

Thus in the existing state of things, the great sea lights of the first order on the coasts of France exhibit eight different characters, which are the following:—

1. Fixed light.
2. Lights eclipsing from minute to minute.
3. Lights eclipsing from half minute to half minute.
4. Lights varied by white flashes.
5. Fixed white light varied by red flashes.
6. Eclipsing light, with flashes alternately red and white.
7. Eclipsing light with two white flashes, succeeded by a red flash.
8. Two fixed white lights.

The same characters and others besides are applied to lights of an inferior order. As it shall be explained in that part of the memorandum which treats of illuminating apparatus, we shall confine ourselves at present to saying that some of these lights are fixed red lights, and others also fixed lights but alternately red and white.

Resumé.—It may be seen that the laws which govern our marine illumination may be summed up in these terms:

To indicate the approach to the coasts at the greatest possible distance by lights, arranged and diversified in such manner that the navigator may be informed of his position as soon as he sees one of them; then to place amongst them lights of which the range may be regulated according to the distances at which it is important to observe them, and which may direct in all surety to the entrance of the port. And to this may be added the problem has been solved in such a manner that on nearly all the points of our seaboard the mariners prefer to make the land by night rather than by day, because they are better and sooner informed of the position of the points which they ought to recognize, and find for their guidance signals which are more apparent and more precise.

The distribution of lights raises still other questions.

In the first place occurs that of the height which should be assigned to them.

It is easy to judge that this height should be such that the tangent drawn from the focus of the apparatus to the surface of the sea may encounter the eye of the observer at a distance from the foot of the tower exactly equal to the range of which the light is susceptible.

Two elements enter, then, into the calculation necessary to determine the height, and these are,—the luminous range of the illuminating apparatus, and the height of the observer above the level of the sea.

If it were desired to calculate the luminous range of apparatus of the first order according to the intensity of the focal light, and taking for the law the decrease in proportion to the square of the distances, and for term of comparison the distance at which an apparatus of the fourth order or an ordinary light, such as the burner of a carcel lamp, radiating freely into space, can be seen distinctly, much higher figures would be found than those which are generally admitted. Thus, let the range of a carcel burner be estimated at three nautical miles only, and it will be found, by the method which has just been indicated, that an apparatus such as that of a light of the first order, with eclipses every minute, having an intensity of about 3,500 burners, ought to range 177·48 miles. An apparatus having an intensity of 600 burners, should range more than 73 miles.

It has not been possible to prove these figures by experiment, for no one of our lights is placed at a sufficient height, and is not in view from a point sufficiently elevated to admit of observations at such considerable distances, but some facts come, if not to support these calculations, at least to prove that the actual ranges of our lights considerably exceeds that which is assigned to them in the official publications.

The fixed light of Cape Béarn, of which the intensity cannot be estimated at more than 600 burners, is sometimes perceived from the lighthouse of Agde, which is distant about 50 miles. This latter light, of which the intensity is about 3,500 burners, is seen from the former very distinctly in all ordinary conditions of the atmosphere, and has consequently a range beyond 50 miles.

But numerous considerations do not allow such considerable ranges to be reckoned on, and these have led to the reduction of the ranges which may be called theoretic, and to their reduction in a proportion the greater as the order of the light is of a higher order. The reduction is

still more marked for the eclipsing lights than for the others.

1st, it is important to consider the opacity of the atmosphere of which the action increases with the distance, and this element cannot be closely appreciated.

2d, a lamp with more than one wick is more liable to vary in intensity than a lamp with one wick only. It requires a certain amount of skill in the keeper, and great vigilance to ensure its maximum effect during the whole night, from which it follows that it is prudent to reckon all the less on the full power of which the apparatus is capable, the higher the order of the light.

3rd, It is also to be remarked that the phenomenon of vision is of physiological order,—that all eyes have not the same faculty of perception, and that prudence should induce a stipulation rather for organs inferior to the average power than for those which surpass it. And it is all the more necessary to have regard to this consideration the more navigators have an interest in seeing the light at a great distance.

4th, when the navigator has entered into the zone illuminated by a light of the first order he is better informed of his position than he was before; he knows on which side his looks should be directed to perceive the second rate light, and the slightest glimmer suffices to fix his attention.

5th, a light which only appears during a small number of seconds is not so well perceived at a like intensity as a permanent light.

6th, lastly, the intensity of the flashes in an eclipsing light is not the same during the entire continuance of the flash. It attains its maximum in the middle, and one cannot reckon on it in calculating the range, for the luminous appearance would be of too short duration to be usefully observed at that limit.

Such are the considerations which have presided over the settlement of the limits to be assigned to the range of the different illuminating apparatus. The figures which have been adopted have doubtless nothing determined, the subject did not admit of it, but they have the merit of having been accepted without dispute, and of being rather under than over the truth in the ordinary conditions of the atmosphere.

The subjoined table gives the luminous range of the principle illuminating apparatus calculated from the law of decrease, according to the square of the distances, admitting a range of three miles for a carcel lamp radiating freely into space; and admitting the maximum intensity for the different apparatus. It places in their relation the ranges which have been adopted in practice.

THEORETIC RANGES, deduction for the opacity of the atmosphere made, and practical range of the lights.

Apparatus.	Hourly consumption of oil.	Intensity of apparatus.	Ranges.		Observations.	
			Calculated.	Adopted.		
			Carcel burners.	Miles.	Miles.	Term of comparison.
CARCEL LAMP	Grammes 40	1	—	—	3	—
CATAOPTIC APPARATUS						
4th order. Fixed, of 0° 375.	60	14	11' 23"	10	—	—
8rd order. Fixed	175	90	28' 46"	13	—	—
2nd order. Fixed	500	280	50' 25"	18	—	—
2nd order. Eclipses 30° to 30'	500	1,200	103' 92"	20	—	—
1st order. Fixed	760	600	73' 47"	20	—	—
1st order. Eclipsing 30° to 30'	760	1,900	130' 77"	22	—	—
1st order. Eclipsing from minute to minute.	760	3,500	177' 48"	27	—	—

The luminous ranges being thus limited, the heights to be assigned to the different apparatus above the level of the sea is calculated, making an hypothesis as to the elevation of an observer with respect to the same plane. The known formula is employed:

$$P = \sqrt{\frac{R B}{0.42}} + \sqrt{\frac{R h'}{0.42}}$$

which takes into account the refraction of the atmosphere, and in which—

- P indicates the range;
- R the radius of the earth at lat. 45° = 6,366,669m.;
- h the height of the focal light above the level of the sea;
- h' the height of the observer's eye above the level of the sea.

It seems that the hypothesis under consideration should be made in the same spirit which presided over the determination of the luminous ranges; that is to say, in such a manner that the effective ranges should be rather over than under the ranges indicated.

A height consequently should be taken as a point of departure, which may be regarded as the lowest at which the eye of the observer placed in a vessel may be found above the sea level; such as, for example, two metres; but one would be thus led to set down figures which would lead to very considerable expenditure on construction, and these expenses would not always have a sufficient motive.

Let us suppose, for example, that a light of the first order, with eclipses from minute to minute, has its base placed at the level of the highest tides. In order that it may be seen at the limit of its range by an observer placed as has just been said, it would be requisite that the focal light should be placed at about 130 metres above the same plane, and it would have sufficed to raise it to 100 metres if one were content with a range of 24 miles, so then it is evident that the advantage which may be derived from allowing a small vessel to perceive the light at 27 miles, instead of observing it only at 24, is not sufficiently great to cause the adoption of the increased expenditure which the increased elevation would require, namely, that of 30 metres of a tower which already has an elevation of 100 metres.

It has not even been thought that it is fitting to reach the last elevation.

The elevation of the towers are regulated as well by the power of the apparatus as by the expense of construction, and the navigators are aware that they should raise themselves to a determined height above the level of the sea, if they wish to perceive a light of which the elevation is known to them, up to the limit fixed for the range.

The subjoined table shows the heights which have been given to certain of the lighthouses of the coasts of France, of which the base is covered at high tide, or is raised but a small distance above the level of the sea; and places in relation the ranges of these lights, and the altitude to which the eye of an observer should be raised to perceive it at these distances.

Name of Light.	Order.	Character.	Range.	Height above the level of the highest tides.		
				Base of Tower.	Focus of the Apparatus.	Observer's eye.
Haut de Brehat.	1st	Fixed - -	20	4' 00"	45	8
La Hague	"	Fixed - -	20	1' 50"	47	7
Duikerque	"	Eclipsing from minute to minute.	27	1' 40"	59	27
Baleines	"	Eclipsing from 30° to 30'	22	0' 45"	50	11
Penmarch	"	Eclipsing from 30° to 30'	22	0' 03"	41	10
Cordouan	"	Eclipsing from minute to minute.	27	3' 00"	59	27
Four	2nd	Eclipsing from 30° to 30'	18	3' 20"	24	13
Lilier	"	Flashing from 4' to 4', preceded and followed by short eclipses.	18	4' 00"	32	8
Haut-banc du Nord.	3rd	Fixed - -	15	7' 00"	22	6
Aigues Mortes	"	Flashing from 4' to 4', preceded and followed by short eclipses.	15	1' 00"	20	7

Certain of the capes which are marked by lights of the first order are so lofty that they raise a question diametrically opposed to that just referred to. It is a maximum and not a minimum which has to be determined.

Two principal considerations lead one not to exceed certain limits for the height of the base of the tower. In the first place, the highest points of mountains are subject

to be clouded; in the second place, the communications with the lighthouse became difficult, and the cost of transport renders the construction more expensive.

The most elevated lighthouse on the coasts of France is the fixed light of first order of Cap Béar. It is 229 meters above the level of the tides. In clear weather this light is seen at great distances at sea, but it is more frequently masked by the fog than if it had been placed on one of the lower gradients of the cape, at an elevation of about 150 metres; and perhaps it is to be regretted that this plan was not adopted. It has also been proposed to place a light of the first order on Cap Sicié, between Marseilles and Toulon, and this point appears to be very well fitted for the purpose when one glances at the chart; but the Commission des Phares has rejected this proposition, because inquiries have shown that the cape is often clouded in consequence of its elevation.

The most elevated lighthouses of the French seaboard are, after the lighthouse of Cap Béar, those of Fécaup (130 m.), La Hève (121 m.), Fatouville (128 m.), D'Agde (126 m.), Cap Camarat (130 m.). The lighthouse of Cap Carbon in Algeria has an elevation of 220 m., and it would probably have been more advantageous in all ways to have placed it lower.

It is impossible to state anything on this subject absolutely. It may be necessary to place a lighthouse on a culminating point, so as to place it in sight of the whole sea horizon, and, moreover, all elevated spots are not equally exposed to be masked by clouds; but it may be stated as a general thesis that there is no real advantage in exceeding a height of 130 m. in all that concerns the really useful range of the lights.

Floating Lights.

There has been no question up to the present time of floating lights, and one need not dwell at length on that subject, because this method of illumination is but little used in France.

Lights placed upon buildings are there much preferred, and that preference is founded on the following reasons:

1st. Floating lights raise the illuminating apparatus to but a small elevation (12 to 14 miles) above the level of the sea, and consequently they have but a very limited range.

2d. They do not seem to offer so much assurance of permanence as the others, when they are moored at points where the sea is at times very heavy.

3d. They require more expenditure on maintenance, and are with difficulty subjected to a sufficiently active surveillance.

They are only employed to point out the sand banks on which it is not thought that they permit the placing of a fixed construction, either by reason of the expense which would be required, or in consequence of the movement of the bank. There are, in fact, but three on the coasts of France. They indicate the moveable bars at the mouth of the Gironde.

Leading Lights.

A question very interesting for practical application is that of knowing what is the distance to be fixed between two lights which are wanted to point out the direction of a passage.

It is necessary, on the one hand, that the lights should be distinct, up to the distance at which they should be seen, and on the other, that when they do not show at the same height one may not stray from the line for which they serve as beacons to such an extent as to go out of the passage, without observing with certainty that they are not placed in the same vertical line.

The first of these conditions springs from the phenomenon of irradiation of which the action is of physiological order, and varies with individuals. The second belongs to correctness of eye, to the feeling for form, which again is still less susceptible of an accurate estimate.

Experiments have been made on this subject at the lighthouse establishment. They have led to the admission that two white lights of the intensity of those which are given to the photophores, that is to say, equal to 50 carcel burners, are very distinctly seen when the radii proceeding from the eye of an observer to each one of them make, in horizontal projection, an angle of 4' 30", and that it is sufficient when these lights are placed at different elevations that the angle is made 6', in order that one may judge whether they are or are not placed in the same vertical line. The breadth of a given channel being known, the position of one of the lights being determined, the conclusion is arrived at from the experiment given as to the position to be assigned to the other light. The figures, moreover, which have been given are looked on as the lower limit, and it is of advantage that the lights should

be seen at more open angles before the limits of the channel are approached.

VI. Number and pay of lighthouse keepers.

The number of keepers varies with the importance and position of the lighthouse.

There are three for the lighthouses of the first order, two for the lighthouses of second and third order. The lights of the fourth order, or fanaux, have but one single keeper.

In the lighthouses which are isolated at sea, there are always three keepers, whatever the order of the light may be, so that the service may never be exposed to interruption, and that leave may be given to the persons employed at regular periods. The lighthouses of the first order which are so placed have four keepers.

The keepers are divided into seven classes, of which the salaries are the following:—

	Francs.
Maitres de phare	- - 1,000
Gardiens de 1re classe	- - 850
„ 2me „	- - 775
„ 3me „	- - 700
„ 4me „	- - 625
„ 5me „	- - 550
„ 6me „	- - 475

The keepers are provided with lodging, fire, and light. They may obtain rewards, of which the maximum is fixed at a month's allowance.

They have the right to a retiring allowance, and in consequence there is a deduction of 5 per cent. on the amount of their allowances.

To this note is annexed the regulations for the keepers on the coasts of France.

VII. and VIII. Replies have been given above to these questions.

IX. Coloured lights.

White lights are those which, for a given expenditure of oil, have the greatest brilliancy, and range the furthest. These are the most numerous, and for a long time others were not allowed on the coasts of France.

The red lights, after these, are most used.

The red colour, while it shows itself with sufficient distinctness, absorbs the least of the luminous rays.

It is obtained by means of glasses coloured with salts of copper, of silver, or gold. Copper gives a very fine red, but has the disadvantage of absorbing $\frac{2}{10}$ of the white light produced by combustion. Silver gives an orange red, and gold a red of a fine purple; each red absorbs about $\frac{3}{5}$ of the light produced. It is impossible to be exact on this subject, because it is very difficult to compare the intensities of two lights of different colours.

A phenomenon of a physiological character, which was discovered after experiments made at the lighthouse establishment (atelier des phares), proves moreover that the red light is less disadvantageous than we might be led to believe by the figures just given. These experiments demonstrate, that at equal intensities red ranges (porte) further than white.

The necessity of preventing confusion between certain lights of very small range has caused green colour to be allowed occasionally.

That is the colour which, after red, is the least disadvantageous. It absorbs about $\frac{3}{5}$ of the light produced.

The other colours absorb much more, and have all been rejected.

X. Principles which govern the choice of colours:—

The colouring of lights is intended to give them a distinguishing character, easily recognized. Nevertheless white lights appear red, and green lights become white, when the atmosphere is misty. It follows that coloured lights never ought to be liable to be seen alone. It is necessary to associate them always with one or several white lights, so that the contrast may cause their nature to be appreciated.

Thus in misty weather, a white light being placed near a red light, the first may assume a red colour, but not to such a degree as to appear as red as the second.

If the white light is associated with a green light, the red colour which the first will present will admit of the appreciation of the true colour of the second.

It follows from this that the lights of the first order which at great distances are seen alone, should never be entirely red, but that, without inconvenience in that case, red and white flashes may be made to alternate, and that fixed red lights are not admissible except for lights of small range (6 to 15 miles), and on condition that they are placed near white lights.

This arrangement is often had recourse to, when two lights are associated to give a course. One of them is white, and illuminates all the sea horizon; the other is red, and its rays are concentrated into an angular space of 10 to 20 degrees, so as to restore to it the intensity which the colouring takes away.

Green lights are chiefly used to indicate the extremity of a pier, to which the navigator has been conducted by other lights.

XI. Arrangement of illuminating apparatus. A reply has been given above to this question.

XII. Drawings of illuminating apparatus employed on the coasts of France.

The apparatus employed on the coasts of France are of two principal kinds; lenticular apparatus and catoptric apparatus. Lenticular apparatus are divided into four orders, according to the number of wicks in the burner of the lamp which illuminates them, or in other terms, according to the quantity of oil which they consume. Some makers have thought fit to increase the number for commercial interests; but the public administration has never admitted a classification which is without value with regard to nautical interests, does not appear to have sufficient motive, and has the disadvantage of assuming marked differences where these are but very slight.

The subjoined table shows the fundamental data for the lamps of each of these four orders:—

Order.	Number of Wicks.	Diameter of Wicks.	Hourly Regulation Consumption of Coiza Oil.	Remarks.
1	4	0.085	700	
		0.064		
		0.043		
		0.022		
2	3	0.069	500	* There are two models of burners of the 3d order, and apparatus of several sizes; the largest burners are placed in the largest apparatus.
		0.045		
		0.023		
		0.009		
3	2	0.019	175	
		0.033		
		0.016		
		0.024		
4	1	0.021	50	
		0.020		
		0.020		
		0.016		

This division by orders has been extended for greater simplicity to catoptric apparatus, and those of this kind which are only illuminated by one lamp with a single wick are ranked with apparatus of the 4th order.

All these which are furnished with a lamp of two wicks, or which include several reflectors, and consequently several lamps with one wick, are regarded as appertaining to the 3d class.

Four sheets of drawings attached to the present note represent the apparatus most used on the coasts of France. They are numbered.

Lenticular apparatus of the first order. (Sheets Nos. 7 and 8.)

1st. Apparatus for fixed light. An apparatus for a fixed light consists of a lenticular drum ("tambour," which is surmounted by a catadioptric crown ("couronne"), and preceded by rings also catadioptric.

It sends to the horizon all the rays which emanate from the focus ("foyer"), and distributes them equally on the whole circumference. This apparatus is represented on the right side of the sheet.

2d. The left side of the same sheet represents an apparatus for a light, varied by flashes from 4 m. to 4 m. These flashes are obtained by means of lenses of vertical elements, which are made to pass in front of the fixed apparatus. The upper lens makes an angle of 4° with the lower lens, so as to prolong the duration of the flash. The flashes are at times coloured red by the application of coloured glasses against the last-mentioned lenses. Another arrangement gives the same appearance to the light. It consists of interpolating angular lenses, similar to those of an eclipsing light, between the lenses of the fixed light. It has a certain economical advantage, and it is generally adapted for apparatus of other orders. It has the disadvantage of requiring that the whole apparatus should be made to revolve, and that is the reason why a hesitation existed as to its adoption. Moreover, it is long since apparatus of 1st order of this character have been executed in France, with which the mariners appeared to be but little satisfied in consequence of the long interval which separates the flashes.

3d. Apparatus for eclipsing from minute to minute.—This apparatus is composed of an octagonal drum, formed by eight annular lenses, and surmounted by a crown, also octagonal, which may either augment the intensity of the flashes produced by the drum, or prolong their duration.

It is on this last point that attention has been fixed. The upper panels make an angle of 4° with the lower panels, and precede them in the direction of the movement.

The catadioptric rings placed below the apparatus constitute a fixed light, which enables navigators not to lose sight of the light at less than ten miles from the coast. This apparatus is represented on the Sheet No. 8.

4th. Apparatus for eclipsing from 30 seconds to 30 seconds.—This apparatus shows the same arrangements as the preceding, except that the drum and the crown are each composed of 16 panels, instead of numbering only eight.

The duration of the flashes may be prolonged in this apparatus, as has been said with regard to the preceding; or their intensity may be augmented by placing the catadioptric lenses immediately above the dioptric lenses. The 4th figure of sheet No. 8 represents a panel so disposed; the lower catadioptric rings producing a fixed light.

5. Apparatus for eclipsing from 20 seconds to 20 seconds.—Each panel only takes in an angle of 15°, the flashes being very near each other, but of small intensity. The usual practice is to suppress the fixed light, and to have three panels placed above each other, as is shown in fig. 5 of the same sheet.

The duration of the revolution of all the eclipsing apparatus is fixed at eight minutes.

Apparatus of the 2d order.—An apparatus of the 2d order for a fixed light is represented on the 9th sheet, and also an apparatus of the same order, with eclipses from 30 seconds to 30 seconds, with prolonged flashes.

Apparatus of the 3d order.—It is not necessary to give drawings of apparatus of the 3d order; they admit of the same arrangements as the preceding.

Apparatus of the 3rd order (small model) and of the 4th order.—The sheet of drawings No. 10 represents a very various apparatus, which shall be described shortly.

Figs. 1, 2, and 3.—Apparatus of 3rd order (petit modèle), showing a light alternately white and red, at intervals of 20 seconds. The lower part of the apparatus consists of a drum of a fixed light; the upper part is formed of a polygonal drum of 12 sides, which is moveable. The lenses of this drum are covered by red glasses. This apparatus has been placed on the "Phare de Walde," near Calais, and is executed in cast glass (verre coulé).

Figs. 4 and 5.—Apparatus of the 3d order (petit modèle), fixed light, varied by flashes, in cut glass.

Figs. 6 and 7.—Small catoptric apparatus for eclipsing light. This apparatus is principally intended for lights provisionally established, when the renewing of an eclipsing light is commenced. The intensity of its flashes is about 200 carcel burners.

Figs. 8 and 9.—Lenticular apparatus of 4th order, fixed light, illuminating $\frac{1}{2}$ of the horizon lamp of constant level (tountain lamp). When an apparatus of this kind has to illuminate the whole horizon, a moderator lamp is substituted for the fountain lamp.

Figs. 10 and 11.—Same apparatus, but of small model.

Figs. 12 and 13.—Lenticular apparatus of the 4th order, in cast glass. These apparatus are very light, and may be placed in a small lantern, which is hoisted every evening on a wooden crutch, or on a cast metal candelabrum, between two directing triangles of forged metal, which oppose themselves to the oscillation. These are very commonly used in France.

Figs. 14 and 15.—Catoptric apparatus of the 4th order, called "appareil sideral," is less useful than the preceding in all respects. The French administration no longer has them made.

Figs. 16 and 17.—Catadioptric apparatus of the 4th order, called "photophore." This apparatus, which has the merit of being very inexpensive, is used for leading lights which do not require a great range; it illuminates an angular space of about 25°.

Figs. 18 and 19.—Lenticular apparatus of the 4th order, in cast glass, for leading lights. This apparatus is much more powerful than the preceding. It has just for the first time been applied to a lighthouse, with fixed

red light, on the Côte de St. George, at the embouchure of the Gironde.

Figs. 20 and 21.—Lenticular apparatus of the 4th order, in cut glass, for leading lights. Gives more brilliancy than the preceding, but sends the luminous rays only into a very small angular space.

The apparatus in cut glass are executed at Paris, in the workshops of Mr. Henry Lepaute, and in those of M. M. Sautter and Co., according to drawings given by the engineers of the central lighthouse service. The apparatus in cast glass are only made by M. M. Gouin & Co.

It is known that lenticular apparatus were invented by Augustin Fresnel. The lenses can be combined, moreover, in divers ways, without any real invention resulting therefrom. The actual director of the lighthouse service has caused many various apparatus to be executed, without ever dreaming of wishing to associate his name with that of the veritable inventor. It has not been so everywhere, and there are added to this note, under the numbers 3 and 4, two little pamphlets which had to be published to rebut certain regrettable pretensions, and to reply to certain attacks still more to be regretted.

It is very essential that the keepers should give to the lamp flames all the development prescribed by the instructions. With a view to be very exact on this subject, the administration has caused to be engraved representations of the natural size of the flames of lamps of divers orders. These documents have the numbers 11, 12, 13.

XIV. and XV. Replies have been given above to these questions.

XVI. Mode of ventilating lanterns.

The drawings attached to this note give an account of the dispositions adopted for this purpose.

The air is introduced into the lantern by a series of rectangular openings made in the lower sill of the lantern, and which are shut at will. It escapes by a central chimney in all the lanterns, and besides by ventilating chimneys placed at the foot of the cupola under each panel in lanterns of the three first orders.

XVII. Nature of the oil.

The oil employed for the illumination of lighthouses is colza oil. Experiments, into the details of which it appears useless to enter, establish that it is the most advantageous of all the common oils, as respects the production of light.

Schist oil, produced by the distillation of bituminous rocks, has been employed for a year in the illumination of certain harbour lights. It has the disadvantage of producing an extremely thick smoke when the flame is not properly managed, but it is cheaper, and has a luminous intensity nearly double for the same consumption. The manner of burning it so as to produce the volume and brilliancy required for lights of the three first orders has not yet been attained.

XVIII. Other methods of producing light.

Several other modes of producing light have been tried, but no one of them has appeared to be of such a nature as to enter into practice. The magneto-electric machine appears to offer a chance of success, and it is at present the object of experiments which are followed out at the "Atelier des Phares." It presents a constant and economical source of electricity, but the problem is not so well solved in what concerns the production of light. The carbons which are found in commerce leave too much to be desired, both as to the duration and the luminous intensity. Certain more favourable results have been already obtained, and are an encouragement to renewed attempts.

XIX. Mode of negotiating for the execution of works and diverse supplies.

The construction of the building of lighthouses is the subject of public adjudications which take place on estimates. When works at sea are in contemplation, which are subject to incidents which do not admit of an appreciation of the expenditure to be made, the adjudication only extends to the furnishing of the materials of construction at the port of embarkation. The transport and the placing of these materials are effected at the cost of the administration, under the immediate direction of the engineers.

The agreements are passed from time to time, and are submitted to the approbation of the minister for the furnishing of floating lights, buoys, beacons, illuminating apparatus, and all the small provisions of wicks, glass chimneys, utensils, &c. These last provisions are delivered to the central lighthouse establishment at Paris, who forward them to the lighthouses as they are wanted.

Special agreements have been entered into for furnishing oil at the lighthouses. The paper of agreement for these contracts is annexed. (No. 5.)

An agreement has been made with a transport contractor for all the transport which appertains to the lighthouse service. (No. 6.)

XX. Reception of supplies.

All the supplies for consumption, except oil, are made at the central lighthouse establishment, where they are verified by the engineer attached to the central service, who prepares when required a memorandum of the receipt.

Oil is received and verified at the lighthouses, according to the provisions of the "Cahier des Charges." (Annex No. 5.)

XXI. Renewal of the paint of lighthouses and buoys, &c., and the materials employed.

The paint of most of the lighthouses is renewed only every two or three years. The floating lights are painted each year. The buoys and beacons are painted every six months. The paint used is white lead or white zinc.

XXII. Manner of colouring.

The system adopted for the colouring of buoys and beacons on the coasts of France has been described in the preliminary observations placed at the head of the description of the lighthouses (annex No. 1.) It need only be added that all the salient angles of docks (mousoirs) and all the towers of harbour lights are coloured white.

XXIII. Examination of propositions relative to lights and beacons, &c.

The note sent to Lord Clarence Paget, to which reference has been made, relative to the first question proposed by the Royal Commission, has shown the course followed for the commencement of works belonging to the establishment of new lighthouses and new buoys, and to important modifications to be introduced into existing establishments.

As to all the questions which belong to the improvement of illuminating apparatus, and to the dispositions to be given to them, they are dealt with by the Engineer Director-General of the service, and it is in like manner to his examination that all inventions concerning lighting and buoyage are referred. The Minister decides on his recommendations.

XXIV. Meteorological instruments, barometers, thermometers, and a small number of rain gauges, are the only instruments of this kind which are placed at lighthouses. The keepers enter their observations on registers, of which it is easy to fancy the composition.

XXV. Tide signals.

The document attached (No. 14) explains the system of tide signals adopted on the coasts of France for indications to be given during the day. The same system can be applied by night by replacing the ball placed at the intersection of the mast and the yard by a red light, and the others by white lights. These night signals are only in use in the port of Havre.

XXVI. Fog signals.

Numerous experiments have been made at the central lighthouse establishment, for the purpose of discovering what is the best apparatus to employ.

It has resulted from these, that a trumpet properly arranged, or whistles acted on by steam or compressed air, give excellent results; but the expense which the placing of machines necessitates, have not allowed the adoption of the system. In the actual state of things, it has been decided to rest content, in the meantime, with a bell, with reflectors of mason work, and set in motion by weights. There is a project of varying the sound, for the purpose of avoiding confusion. The question is still under consideration.

XXVII. Drawings of the buildings of lighthouses.

There is attached to this note, under the numbers 15 to 26, drawings of the lighthouses described below.

No. 5. Phare des Héaux de Bréhat. 1st order, fixed light, built of granite; the oil store is placed in the building marked A. on the drawing.

It contains the regulation supply. The annual expenses of maintenance are estimated at 10,376f.

The illuminating apparatus cost 45,977f. 87c.

The total expenses amounted to 577,984f. 73c.

No. 16. Phare de Calais. 1st order, varied by flashes; built of brick and calcareous stone; the oil store is placed in the cellars.

Regulation stores.

Expense of annual maintenance - 8,215f. 69c.

Price of illuminating apparatus - 61,209f. 86c.

Total expenditure - 248,190f. 68c.

No. 17 and 18. Phare des Baleines. 1st order, clipping from 30 seconds to 30 seconds; built of calcareous stone; the oil store placed at A. on the drawing.

Regulation stores.

Expense of annual maintenance - 8,134f. 95c.
Price of illuminating apparatus - 70,017f. 22c.
Total expense of first establishment 550,263f. 77c.

No. 19. Phare de la Canche. 1st order, fixed. The embouchure of La Canche is indicated by two lighthouses, with fixed lights of the 1st order, distant the one from the other 200 metres. They have both the same form. Between them is a small house, intended for the lodging of the maitre de phare, and for reserved apartments.

Built of bricks and calcareous stone; the oil cellar is placed at A. on the drawing.

Expense of annual maintenance of
both - - - - - 15,610f. 80c.
Price of illuminating apparatus - 98,422f. 33c.
Total expense of first establishment 586,480f. 88c.

No. 20. Phare de la Grand Ile Sanguinaire in Corsica. 1st order, varied by flashes. Constructed on a mamelon, which is 98 meters above the level of the sea. The families of the keepers are not lodged in this lighthouse. Built of granite. The oil stores are at A. on the drawing.

Expense of annual maintenance - 10,427f. 25c.
Price of illuminating apparatus - 55,446f. 92c.
Total expense of first establishment 153,011f. 44c.

No. 21. Phare de Kermorvan. 3d order, fixed light. Built on a headland of rock, which bridge of masonry joins to the mainland. Built of granite. Oil stores at A. on the drawing Fig. 2.

Expense of maintenance - - - - 1,848f. 75c.
Price of apparatus - - - - - 7,053f. 74c.
Total expense of first establishment 55,123f. 18c.

No. 22. Tower for harbour light. Drawing of the type adopted. Is executed in stone or in brick. The expense varies from one place to another; it may be estimated at a mean of 8,000 francs.

No. 23. A scaffold in carpenters work, for a harbour light or leading light.

No. 24. Candelabra, in cast metal, for harbour light; a little shelter of canvas is at times placed at the foot of these candelabra, so that the light may be lit under cover.

No. 25. Dwelling of guardian with "Fanal." This arrangement is often used for leading lights.

XXVIII. to XXX. Buoys and Beacons.

Various forms of buoy are employed on the coasts of France; they resemble more or less those which are in use on the coast of England, and it is not yet perfectly decided which one merits the preference.

The sheet of Drawings, No. 26, represents the last

form of buoy adopted by the French administration. This buoy is executed in sheet iron (tole); it weighs about 1,750 kilogrammes, the cast ballast not included. This ballast is disposed so as to be regulated according to the length of the mooring chain. Its maximum weight is 740 kilogrammes. The form of the marks (voyants) vary with each buoy. The mooring chains are of iron, round, of 0.034m. diameter. The moorings are mushrooms in cast metal, of from 600 to 700 kilogrammes, for sandy bottoms, and anchors with forked fluke for rocky bottoms. These buoys hold themselves well on the water.

Beacons are executed according to divers systems, according to the local circumstances.

On certain points they consist of simple perches of wood or iron, which are plated on the shoal to be pointed out, and are usually surmounted by a mark (voyant). This arrangement is economical, but it is but little satisfactory. The beacons are badly seen, and are frequently broken.

Certain of these works consist of pyramids of three or four sides, executed in forged iron, and which are furnished with panels of plank or sheet iron on their upper part. This construction is more expensive, but it is durable and very visible.

In conclusion there are also to be found towers of masonry, executed not of hewn stone as formerly, but of small materials, of which the transport and disembarkation are easy. These stones are built in with a mortar of Portland cement in the interior of the work, and with a rapidly setting cement, such as the Parker Medina, on the outer courses. It is the rule that the towers should have an elevation of at least four meters above the level of the highest tides, and that their diameter should be the half of their height, and never be less than three meters.

Such is the information which the undersigned thinks of a kind to meet the wishes of the Royal Commission. He regrets not to have been able to enter into more extensive details, but the Royal Commission will find him very anxious to reply to all the new demands which it will do him the honour to address to him.

REYNAUD.

Paris, the 26th of June 1860.

On the 23rd of January, 1861, Mons. Reynaud had the goodness to furnish the Commission with the last edition of the following printed documents, carefully drawn up and containing very precise instructions:—

1. *Instructions pour le service des phares lenticulaires.*
2. *Instructions sur le service des fanaux.*
3. *Detail estimatif des dépenses annuelles du service de l'éclairage des phares et fanaux des côtes de France.*

9.—DENMARK.

ANSWERS TO QUERIES RELATIVE TO LIGHTS, BUOYS, AND BEACONS.

a. *Lights, Buoys (floating marks), and Beacons.*

I. The light and buoy service is placed under the superintendence of the Ministry of Marine, who decides directly upon all concerns relative to the personnel, its admission and dismissal, discipline, &c., decides upon the foundation and placing of new light establishments and sea marks, upon alterations in the old ones; further, upon all matters that may subserve the developing of the light, and buoy system.

One light engineer and two buoy inspectors, furnished with instructions relative to their respective official duties, manage the particulars of the business.

a. Instruction for the light engineer, d.d. 14 March, 1859.

b. Instructions for the buoy inspectors, d.d. 6th May, 1852, and 16th February, 1853, herewith appended.

Under the engineer are placed all technical matters relative to the lights, such as the maintenance of the establishments, of the apparatus and inventory; further, the supply of the lights with articles of consumption, &c.

Under the buoy inspectors are placed the maintenance and attendance of all the floating marks and beacons of the country, for which purpose the fairways of the monarchy are divided into two districts, of which

the one, the eastern district, embraces the fairways east of Jutland and the duchies; the other, the western district, the channels on the western coast of the monarchy south of "Blaavandshuk" to the Ell.

The buoy inspectors constantly frequent each his district, in order to ascertain the condition of the marks, whether they be in their due positions, and whether the local inspection, organized at different places, be performed in a satisfactory manner.

The buoy inspectors thus constantly having opportunity to observe the burning of the lights, are, relative to the control of the management of the lights and the service of the keepers, co-ordinate with the light engineer, and are, therefore, named "light and buoy inspectors."

II. The necessary funds for the light and buoy service are obtained by appropriation of the legislature, "the council of the realm" ("Rigsraadet"), and are always voted for a biennium of finances.

The expenditure consists of two principal categories, viz., ordinary and extraordinary expenses. The first embrace the sums annually expended on wages of the personnel, on the maintenance of the materials approved of, &c.; the latter are the sums appropriated to the motivated material of the ministry for the erection of new lights, for the augmentation of the sea-mark material, and upon the whole for works of rather great extension.

In 1858, the ordinary expenses on the light service amounted to, say,—

	Rdl.
For wages - - - - -	38,835
„ oil and fuel - - - - -	21,302
„ maintenance, ground rent, &c. - - - - -	27,130
	87,267
„ steaming assistance to light and buoy service, estimated to - - - - -	2,300
Extraordinary - - - - -	63,200
	152,467

In the same year, the ordinary expenses on the buoy service were, say—

	Rdl.
For wages - - - - -	4,470
„ local inspection - - - - -	7,140
„ maintenance - - - - -	12,855
	24,465
Extraordinary - - - - -	9,856
	34,321

The light assistants by all lights - - - 300 rdl. each
 The wages of the attendants are regulated separately for each light, yet in such a manner that the same do not exceed for each individual - - - - - 300 " "

By the Lightvessels.

Lightship masters, each - - - - - 600 " "
 Mates, each - - - - - 360 " "

Further, the light-masters and the assistants obtain a piece of ground large enough for keeping respective two cows or one cow, or compensation thereof in money; they have free lodgings and pay neither tithe nor royal taxes.

To the lightship masters and mates is given shipfare free during the station time of the vessel, and when laid up in winter quarters, respective 1 rdlr. and 64 sch. daily allowance in lieu of the fare in natura.

The servants act under the personal responsibility of the concerned light-master, and may be chosen, with the exception of those employed at the lights of the 1st order, among the female sex, if the circumstances will allow. The lightmaster may, if he chooses, hire and take these servants, to the support of which he obtains an annual compensation of from 150 rdlr. to 180 rdlr., according to the local circumstances.

III. Plan to the new list of lights hereunto appended.

Note.—This list of lights is preserved with the original papers.

IV. The establishment of a light being resolved, it is to be decided upon whether the light can be shown from the shore or absolutely must be shown from a vessel; and it is evident that we, the territorial circumstances allowing of the foundation of a tower, and for the rest, the option being with us, rather choose the first alternative, regarding the relative greater cost of the annual maintenance of a lightvessel. Any general principle, therefore, cannot be put down, yet we endeavour to pack the lights as outwardly as possible on the points that are to be passed.

V. The lights are divided into government and communal lights; to the first, the main part, are reckoned all the "sea lights;" to the latter, a few small lights, only leading marks at the entrance to roadsteads or harbours. This sort of lights, as far as they are thought proper to be mentioned in the list of the lights of the monarchy, is therein classified as "harbour lights." They are maintained at the cost of the respective communities.

VI. The inspection and control of the lights, as mentioned in § 1, is rewarded as follows:—

The light engineer, salary - - - - -	1,400 rdl.
„ „ allowance per day when travelling - - - - -	3 „

The light and buoy inspectors being naval officers their pay as such, and corresponding allowances when travelling.

The personnel of lower officials is distributed as follows:—For a light of the 1st order are allowed three for a light; of the 2nd, 3rd, 4th, or 5th order; two officials; and for a light of the 6th order, one official. The localities of a few lights established on very isolated points on uninhabited islands, where it is necessary to keep boats, compel, however, to deviate from this arrangement, and to augment the regulated number by 1-2 individuals.

Commissioned are:—For the lights of the 1st, 2nd, and 3rd order, two lightkeepers (one lightmaster and one assistant); for the lights of the 4th or 5th order, one lightmaster; the official by the light of the 6th order is named "attendant," the small and frequently quite plain apparatus regularly not claiming a steady watch in the burning time as necessary, if but a regular attendance be kept, and where thus the nature of the service not forbids the keepers to unite another occupation as principal livelihood with the light service; hence this sort of officials is sought for among the populace in the vicinity of such lights, generally they are post or custom officials.

To the class of servants are reckoned the 3rd official by the lights of the 1st order, and the subalterns by the lights of the 4th and 5th order.

The commissioned officials in the lightvessels are—one master and one mate.

The salaries for the commissioned officials are as follows:—

By the Lights.

The principal lightkeepers (lightmasters) by lights of the 1st and 2nd order - - - - -	600 rdl. each
„ „ of the 3rd order - - - - -	500 " "
„ „ of the 4th and 5th order - - - - -	450 " "

VII. Head lights or lights of the 1st order are considered necessary only on such points of the coast of the country where they have to lead in from the open sea, lights of the 2nd and 3rd or lower order being perfectly sufficient for the leading or warning of the navigation in the fairways that surround the islands.

VIII. Regarding the lighting power of the light apparatus, are in use—

- a, fixed lights,
- b, revolving lights, and
- c, fixed lights with flashes.

See the list of lights mentioned, sub 3.

IX. See the list of lights, by which it also will appear that the coloured lights are either red or green, the red light always being preferred to the green if the circumstances permit of any choice.

X. The lighting power of a light is defined according to the speciality of the fairway that is to be illuminated. To make the light more powerful than necessary is, from a state economical point of view, considered as wrong as it in nautical respect could be pernicious. As regards the mechanical arrangement of the light apparatus, the species that gives to the light the greatest intensity is preferred, viz., "fixed light with flashes," if for the option for the rest be free and no mistaking it for other lights in the vicinity to apprehend.

The coloured light is indeed one distinction more besides the three above mentioned to define the character of the lights, the use of coloured light, however, weakening the lighting power, it is only applied to a few small lights where necessary, and where these are not to be reckoned in the category of sea-lights."

Such are the principle rules which, as mentioned in the execution, are subject to different influences, hence they cannot be considered to involve any general principle.

XI. The lights have either lens or reflecting apparatus as noted in the annexed list. Generally, the lens apparatus are preferred, whose advantages are too often demonstrated and too universally acknowledged as to need being exposed. The lens apparatus will therefore, by-and-by, be introduced in all Danish light establishments, however, with the following three exceptions:—

- 1. Fixed lights, whose illuminating angle is less than 180°.
- 2. Revolving lights of lower order than the 3rd, such not being answerable, or of the 3rd order with very short, 10 sec., or with very long, 2 min. flashes.
- 3. Harbour lights, where the use of reflecting apparatus generally is more convenient as well in reference to the application as to the attendance.

XII. All the lens apparatus in use in the Danish light system are on the Fresnel principle executed by the mechanic Lepaute in Paris, always furnished with the most recent improvements. As regards the wished-for drawings, refer to the mechanic himself.

XIII. Annexed, the sent table filled up.

TABLE OF PRICES.

LENS LIGHT OF THE FIRST ORDER.	Price, - fixed	149l. 5s. 6d.	
		Ordinary Repairs -	10l. 13s. 1d.
		Oil { Consumption -	13·8l. gallons.
			Cost - - -
Wicks { Consumption -	4·2'		
	Cost - - -	13·8d.	
LENS LIGHT OF THE SECOND ORDER	Price, - flashing	130l. 3s. 2d.	
		Ordinary Repairs -	8l. 14s. 11d.
		Oil { Consumption -	9·7s. gallons.
			Cost - - -
Wicks { Consumption -	1·2'		
	Cost - - -	3·3d.	
LENS LIGHT OF THE THIRD ORDER.	Price, fixed and flashing	822l. 7s. 10d.	
		Ordinary Repairs -	7l. 3s. 6d.
		Oil { Consumption -	4·25 gallons.
			Cost - - -
Wicks { Consumption -	0·97'		
	Cost - - -	1·9d.	
LENS LIGHT OF THE FOURTH ORDER.	Price, - fixed	158l. 17s. 7d.	
		Ordinary Repairs -	5l. 0s. 11d.
		Oil { Consumption -	3·18 gallons.
			Cost - - -
Wicks { Consumption -	0·97'		
	Cost - - -	1·6d.	
LENS LIGHT OF THE FIFTH ORDER.	Price, - fixed	102l. 1s. 7d.	
		Ordinary Repairs -	3l. 7s. 3d.
		Oil { Consumption -	1·48 gallons.
			Cost - - -
Wicks { Consumption -	0·56'		
	Cost - - -	0·9d.	
REFLECTOR LIGHTS WITH NINE BURNERS.	Price, - flashing	168l. 4s. 6d.	
		Ordinary Repairs -	5l. 0s. 11d.
		Oil { Consumption -	5·95 gallons.
			Cost - - -
Wicks { Consumption -	2·1'		
	Cost - - -	1·6d.	
SIDERAL REFLECTOR LIGHT WITH ONE BURNER.	Price, - fixed	4l. 9s. 8d.	
		Ordinary Repairs -	2l. 4s. 10d.
		Oil { Consumption -	1·49 gallons.
			Cost - - -
Wicks { Consumption -	0·33'		
	Cost - - -	0·39d.	

XIV. In the selection of the lighting apparatus we seek to obtain the greatest possible difference in the lighting effect between contiguous lights principally by alternating with fixed lights, revolving lights, and, where necessary, with fixed lights with flashes. For further distinction are also used different division of time for the apparition of flashes, varying from ten seconds to two minutes. Coloured lights as mentioned in X. are avoided, namely, as regards the principal fairways.

XV. As regards the height of the light of the lighthouses it is adopted the same in new lights not to exceed 180 feet Danish measure.

XVI. The ventilation of the lanterns is regulated by 3 to 5 brass ventilators provided in the parapet wall beneath the lantern, and by a turn-cap on the summit of the cowl of the lantern. The products of the combustion are through copper-pipes furnished with dampers carried from the lamps up into a great vertical copper tube, which opens in the turn-cap mentioned above, and, by openings in the sides, can take up any vitiated air in the lantern room. The smoke from the stove is by other copper pipes carried through the cowl, and to the end of the tube a turn-cap is fitted. In order to prevent the lantern panes from being coated with dew and ice during the winter, the lanterns in the greater lighthouses are provided with double plate-glass panes, between which chlorcalcium is put in order to attract the moisture that might force its way in between the panes.

XVII. XVIII. For the light-flames is with very few exceptions no other illuminating stuff in use than best refined rape-seed oil.

XIX. a. All the lighthouse buildings, lightvessels, and all materials belong to the navy yard, and the maintenance thereof is provided by the same.

The lightvessels are built and equipped at the navy yard.

The buildings are erected by contract with mechanics throughout the country and the materials are principally delivered by public tenders.

b. All apparatus, the lens apparatus and reflectors for the lightvessels excepted, are made in the

mechanical workshops in the country, and so are the lanterns, which are made of bronze with transverse framing and double plate-glass panes, and covered with a double copper cowl.

The lens apparatus are furnished by the manufactory of Lepaute in Paris, and the silvered parabolic mirrors for the lightvessels by the manufactory of Wilkins in London.

c. All the light-buildings are painted and maintained either by agreements to different amounts made yearly with mechanics in the vicinity, or by contracts for several years to definite yearly amounts. This latter mode is found answerable particularly for isolated establishments.

d. All materials for the light establishments are provided either by public tenders or by contracts, are stored at the navy yard, and are sent off twice a year to the light establishments.

e. A few lights are attended to and maintained by contract yearly.

These contracts are successively rescinded, a direct administration being considered more answerable.

XX. All materials for the lights are, before being put in store, tested by a committee, of which the engineer is a member. Each lot of oil is tested by burning in test-lamps for the special purpose, and if the lamps burn free for 20 hours, without much charring of the wick, the oil for the rest being limpid, having a fresh odour, and being free from acid, which is tested by lacmus-paper, it is accepted. The whole stock of oil is consumed within nine months after the testing. The wicks and glass-chimneys are tested by comparing the same to pattern checked for the purpose. The wool in the wicks is made of untwined silk and the warping of brown cotton.

XXI, XXII. All light establishments, lightships, beacons, and floating marks are subject to inspection once a year. The brick-towers, where used as day-marks, are kept whitewashed as far as thought necessary for the furtherance of the purpose, otherwise the natural stone-colour is preserved; all the iron towers are painted white with red upper parts (caps); all the lightvessels have the outer-side of the hull painted red, with a white cross, in the horizontal part of which the name of the station is set in black Roman letters. The beacons are generally painted black or tarred, and the floating-marks, namely the buoys, are painted with such colours as are regarded the most agreeable to the purpose,—the guidance of mariners. In the annexed list of buoys the different colours given to buoys, perch buoys, &c. may be seen.

XXIII. In the year 1854, a plan to an adequate coherent illumination of the fairways of the monarchy has been elaborated by a Commission appointed for the purpose; this plan has been approved of by the ministry, and endeavours are continually made for carrying it into effect.

The plan gives for each singular establishment the order and class of the light apparatus, the character or lighting effect of the light, the height of the light-flame over the level of the sea, and the range of the lighting. As to future experiments with new illuminating stuffs and other essential improvements and changes in the method at present in general use, we cede to the greater nations to try such, adopting but the results which have proved practicable and answerable for the development of the light system, either through the initiative of the light-engineer, propositions from committees O. T. L., or by immediate ministerial resolution.

As regards the development of the buoy system, the buoy inspectors have the initiative relative to the improvement of the material, and concerning propositions to the placing of new seamarks, such are generally made by the officers of the navy, who generally are detached on surveys in our waters; none of the mentioned arrangements, however, can be put in operation without authorization of the ministry.

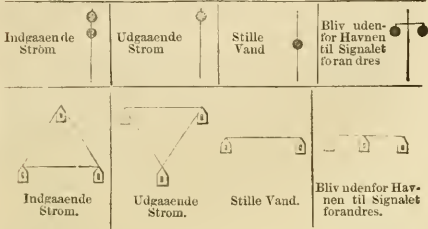
XXIV. The observations of the barometer, of the psychrometer, of the appearance of the air, the direction and force of the wind, are made in the Danish light-houses at 7 and 10 A.M., at noon, and at 2, 4, 11 P.M. The quantity of rain-water fallen is emptied at 9 A.M.

XXV. Signals indicating to passing ships the state of the tide are not made from any point on the coast of the monarchy, nor from the lightships, as notice for the entrance into a few friths on the western coast, and for the post steamers in Korsør harbour, a few common

optical telegraphical means are put up, which, however, are of no interest for the navigation in general. The annexed drawing shows the signal-system in use in Korsør harbour.

STRÖM-SIGNALER for POSTDAMP-SKIBENE ved KORSÖR HAVNE-INDLÖB.

	Dag-Signaler.	Nat-Signaler.
Indgaaende Strom	2 Balloner i Top	Gives med Lanterne som nedemunder vust.
Udgaaende Strom	1 Ballon i Top.	
Stille Vand	1 Ballon paa halv Stang.	
Ualmindelig haard strøm.	Rødt Flag over Ballonerne.	
Bliv udenfor Havnen til Signalet forandres.	2 Balloner heist trærs over Staugen.	



XXVI. Neither are fog-signals given from the shore; the lightship masters are, however, instructed to let a gong be struck in such cases, five minutes at a time, with an interval of five minutes.

XXVII. Drawing of Skagen light, hereunto annexed.

- The materials of the Skagen light-buildings is yellow, hard-burnt bricks, the exterior course of masonry in the tower excepted, which is made of red Dutch fire-bricks (clinkers). The mortar is rich Faxö lime and sharp granulated sand, in the proportion of six sands to one lime. The fundament is laid with pommerian timbers; viz. 264 piles of $\frac{1}{2}$ inch, and a timber frame of $\frac{1}{2}$ inch pommerian timber. Upon this are set two entire courses 18 inch cleft granite stone, and thereupon as high as to the surface of the ground five circular courses of cut granite stone in bond of union, and in the interior laid with burnt bricks. The sole is made of cut granite stone, all the bands, benches, the platform and coping-stones on the parapet wall of Bremen sand-stone.
- The oil-room is arranged in the ground-floor of the principal building, and surrounded by double walls, stone-floor and vault of masonry, and iron door, so as to be fire and frost proof. Where the localities permit thereof the oil-cellar is arranged under ground in the corridor building that unites the dwellings with the tower.
- Every six months the quantity of oil and lime of Vienna as necessary for the consumption in nine months is delivered, and yearly what other articles are wanted for the consumption in 15 months.

As to the store of light-inventory, see the accompanying list.

	£	s.	d.
d. Salary of principal lightkeeper	-	-	56 1 6
Salary of the assistant	-	-	28 0 9
„ lighters	-	-	22 8 7
Consumption of oil	-	-	104 13 5
Glass-chimneys, wicks, cleansing material, inventory, &c.	-	-	11 4 4
Freightage and postage	-	-	5 12 2
Maintenance of the buildings	-	-	44 17 2
e. The price of the lens apparatus for the Skagen light, being a fixed light of the 1st order, 1,644. 2s.			
f. The cost of the light establishment of Skagen amounts, viz. :-	£	s.	d.
Ground and lot of land	to	61	17 9
Buildings	-	18,109	11 3
Lantern with panes	-	1,218	4 5
Lens apparatus	-	1,644	0 2
Setting up of the apparatus and lantern, inventory, &c.	-	-	374 19 5
Total	-	£21,408	13 0

Inventory of Stores for Skagen Light.

Lamps	-	-	-	3
Spare burners	-	-	-	3
Teller	-	-	-	1
Smoke-pipes	-	-	-	3
Keys for clockwork	-	-	-	2
Screw-jacks	-	-	-	3
Need-lamp	-	-	-	1
Watch-lamp	-	-	-	1
Lighting lamps	-	-	-	2
Lanterns	-	-	-	3
Oil-heater	-	-	-	1
Oil-filtering machine with footboard	-	-	-	1
Oil-cisterns with lock and footboard	-	-	-	8
Oil pump	-	-	-	1
Oil cans	-	-	-	4
Cock for oil barrel	-	-	-	1
Oil troughs (one with double bottom)	-	-	-	4
Iron-plate scraper for cleansing of burners	-	-	-	1
Wick-formers	-	-	-	4
Wick-measures	-	-	-	4
Iron-plate basket for cleansing material	-	-	-	1
Iron-plate boxes for wicks and skins	-	-	-	2
Iron-plate cases for rouge powder and lime of Vienna	-	-	-	2
Pairs of spectacles	-	-	-	2
Trimming-scissors (1 straight, 2 curve, 2 flat)	-	-	-	5
Pliers for glass-chimneys	-	-	-	1
Box for tools.	-	-	-	-
Bubble-plummet (round)	-	-	-	1
Plumb-bob	-	-	-	1
Knives (1 common, 1 soldering-knife)	-	-	-	2
Screw keys (1 screw-wrench)	-	-	-	2
Hammer	-	-	-	1
Pinchers	-	-	-	1
Nippers	-	-	-	1
Soldering-iron	-	-	-	1
Screw-driver (with three blades)	-	-	-	1
Plough-diamond	-	-	-	1
Glass-breaker	-	-	-	1
Watch	-	-	-	1
Looking-glass	-	-	-	1
Thermometer	-	-	-	1
Flag with line	-	-	-	1
Mortar with pestle	-	-	-	1
Set of measures (1, $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, and $\frac{1}{8}$ pot)	-	-	-	1
Funnel	-	-	-	1
Set of fire-tongs and shovel	-	-	-	1
Fire-box	-	-	-	1
Iron-box for fuel	-	-	-	1
Set of blinds	-	-	-	1
Set of curtains for apparatus	-	-	-	1
Tablet	-	-	-	1
Spitting boxes	-	-	-	2
Mats	-	-	-	2
Sweeping shovel	-	-	-	1
Dusting brush	-	-	-	1
Pencils	-	-	-	2
Seal	-	-	-	1
Posthag	-	-	-	1
Iron money-chest with lock	-	-	-	1

XXVIII. Hereunto annexed a list of the perch buoys and description thereof.

Close Explanations.

Those floating marks mentioned in the list under the name of "conical buoys" (coniske Tønder) all together deriving from a former buoying system, are by and by, as they are drawn into condemnation for great age, to be replaced by pointed or bottle-shaped buoys, which possess greater supporting power and work less in the moorings.

Also the supporting means of the stakes of the perch buoys, in as far as they are conical buoys, are by and by to be changed for bottle-shaped ones.

Those floating marks set apart as belonging to the ancient store of materials, the actual buoying system consists, a few marks of common barrel-form omitted, partly of Peacock's buoys, pointed and bottle-shaped buoys, partly of summer and winter perch buoys, or, as they also called, cask buoys (Tøndevagern) and log or ice perch buoys.

The Peacock buoys and the elements and appearance of the perch buoys are briefly touched upon in the "general review." The buoys are ordinarily made of oaken staves put together in the customary manner by strong iron hoops, kept at their place by small plate irons rivetted to the staves and by iron bands, which lengthways of the buoy cross the hoops.

The buoys are of different sizes, suited to the localities in the fairways where they are employed, the length of the nun buoys (Spidstøndene) thus being 13, 9, 6, and 4 feet, with a diameter over the middle of 5 $\frac{1}{2}$, 4 $\frac{1}{2}$, 3 $\frac{1}{2}$, and 2 feet; the length of the bottle-shaped buoys is 9, 7, 5, and 4 feet, with a diameter at the bottom of respective 4 $\frac{1}{2}$, 3 $\frac{1}{2}$, 3 $\frac{1}{2}$, and 2 $\frac{1}{2}$ feet.

The buoys for winter use of both sorts differ from those prepared for summer use but therein that the staves are lengthways over the whole, coated with hand iron to the very points, which are coated with thin iron plates, to prevent the ice from cutting the wood and breaking the staves.

Besides through the different size and form, the buoys are distinguished through different colour, and where the circumstances make it desirable for further guidance for the navigation, also through one or another distinction painted on the buoy, or through one of those top-marks for the perch buoys mentioned in the "general review."

From the above given dimensions and shapes differ, however, a little the nun buoys made of iron plate, which altogether are 12 $\frac{1}{2}$ feet long, with a diameter of towards 4 feet on the broadest.

These iron buoys and all the 13 feet nun buoys are floating in an upright position; the stability necessary for this purpose is provided through a fixed bottom applied at a certain height from the foot-end, thus furnishing them with a compartment into which the water may run through holes managed in the lower end of the buoy.

The attendance to the floating marks, as far as the circumstances allow, is placed under the local control of the coasters in the neighbourhood, who keep boats, against an annual reward.

In the eastern district, where the boats ordinarily are small and at some places unfit for the managing of the larger and more ponderous sea marks, together with their mooring apparatus, the perch buoys as more transportable are used for marking.

In the western district, where boats well fitted for the attendance of the larger marks are not wanting, and where besides it is in the interest of the navigation that both sides of the principal fairways, cut deep in between the islands and the sands, are distinguished through high showing marks, distinguishable at a long distance in the hollow sea setting in under a sea storm; in this district the perch buoys are not employed, but in a few small fairways not much used, and in the inner part of the by-passages where sea and current are less strong than in the outer-passages.

Where in the list it is not noted to the respective marks, that they are taken in during the winter or changed for special winter marks, they still lie out all the year round, and are only taken in for inspection, during which they are replaced by spare marks. The use of the 5 and 6 feet iron-tipped winter buoys, formerly employed only in the southern part of the western district, for replacing of the more expensive 7 and 9 feet buoys, is, however, of late, from economical points of view, extended for replacing also of the rest of the 7 and 9 feet buoys in the district, denoting points that are kept marked during the winter, with exception only of the few buoys of the often mentioned dimensions, which instead of the Peacock's buoys are used as winter entrance marks, and on account of this their special purpose not easily to be changed for less showing marks.

That we may effect the yearly shifting necessary for the inspection, and thorough drying of the floating marks, we have two sets of buoys and perch buoys.

The reserve goods are kept in what are called buoy magazines, whose site is chosen in such a manner that the distribution of the marks therefrom can be made speedily and conveniently. Such magazines are in Copenhagen, Dragør, Elsiner, Kallundborg, Svendborg, on the Isle of Læsø, in Norby and Sønderho, on the Isle of Fanø, at List, on the Isle of Amrum, in Husum, and in Horst, near Büsum.

All floating marks but the winter perch buoys, are laid down in slack mooring, the length of which is determined according to the nature of the bottom, the force of the current and the sea, that in stormy weather most frequently prevails in the fairway. Hence the moorings for the marks in the eastern district are always at least twice as long as the depth, and in the western about four times as long as the depth.

The winter perch buoys, because of the particular manner in which they are made to float, must stand in tight mooring.

The annexed drawings give but the necessary explanations of the construction of each particular sort, not the different dimensions of each sort, the size not having influence on the principle of construction.

The drawings thus showing :

No. 1, a Peacock's buoy.

No. 2, an upright floating iron nun buoy (Spidstønde).

No. 3, an upright floating, 13 feet, nun buoy of oaken staves.

No. 4, an ordinary nun buoy for summer or winter use.

No. 5 and 6, a bottle buoy for summer, and another for winter use; and

No. 7, a summer and winter perch buoy.

Concerning these marks, their moorings and their original cost, is to remark.—

No. 1. The uprights and stanchions are wooden, of a light construction and tipped with iron bands, the buoy itself consisting of iron plates 1 inch thick, rivetted together over an iron keel, weighing about 250 lb. serving as ballast.

The weight, however, being too light to give the buoy the necessary stability, 4 pig-irons à 100 lb. are of late added, rivetted to the keel on both sides, but these are not shown in the drawing.

The mooring chain is 1 $\frac{1}{2}$ inch in diameter, and 20 fathoms long, the anchor is a flat, rough hewn granite stone of about 1,000 lbs. weight, to which a smaller stone of about 500 lbs. is backed by chain $\frac{3}{4}$ inch in diameter, and 15 fathoms long. The buoy seldom possessing power sufficient to stretch the moorings chain of about 1,350 lbs. weight, and which ordinarily bores itself into the soft ground, and through the thereby lessened swing room easily is exposed to part under a gale suddenly sprung up; 3 or 4 buoys of such supporting power, that the chain is kept from sinking too deep in the sand, are distributed on a length of about 14 fathoms from the anchor stone.

Nos. 2, 3, 4, 5, and 6. As mentioned above, the means of transport in the eastern district make troublesome, yet, forbid the employment of bulky sea marks in the fairways of the district. With special regard hereto, the taper, nowhere else employed, iron nun buoys, of about 1,600 lbs. weight, sketch No. 2, are constructed.

The buoys are made of iron plates rivetted together, having three compartments, the one above the other, separated by iron platforms and united by angle rings. The two upper compartments are watertight, and the bottom separating one from another has in the middle a hole, with a screw cover, of such a width that a man in case of repair may pass through it. The lower very narrowed and funnel-formed compartment is, on the contrary, open beneath, in order to allow the entering of the water, the outer rim being, moreover, provided with small holes, through which the air is forced out by the pressure of the water by degrees as it rises in the compartment. The upper plate of the buoy carrying a holster for the top perch, and being of the same diameter as the above-mentioned covered hole, is inserted in the upper angle ring by tap screws, and packed with cement. In the upper compartment of the buoy the plates are of $\frac{3}{16}$ ths, in the middle of $\frac{1}{16}$ ths, and in the lower of $\frac{1}{16}$ ths the inch iron.

At present these buoys are used only for denoting some of the most dangerous shoals in the district, but successively, the circumstances allowing thereof, they will get a more extended employment. They are lying out during the winter without being changed for special winter marks, as it appears that the same, though sometimes injured or dragged away by the ice, seldom are totally lost, but are in the spring found either hanging about the moorings or thrown up on the nearest coast, towards which the watertight compartments and the narrow fairways where they are used may have contributed.

In contradistinction to the iron nun buoys is shown in drawing, No. 3; a nun buoy, likewise constructed for floating in an upright position, of such a form as experience has proved the most answerable for nun buoys, and as generally the totality of the buoy material in the western district made of oaken staves.

In the buoys of this description, the water penetrates into the ballast room, through some holes made in the staves. In the list of the perch buoys this sort of buoys is noted only under No. current 44 and 150, but of late their number has much increased. They are very striking, and are, as the above-mentioned iron nun buoys, made farther distinguishable by a top sign, generally consisting in a balloon of basket-make or iron bands set up on a short perch.

As the iron nun buoys, these buoys are used for denotation of the most dangerous shoals, and besides for marking of the turning points from the principal passages into their ramifications, but they are always taken in during the winter, as the ice otherwise would act detrimentally upon them. Some are then replaced by perch buoys, or by six feet nun buoys floating in the ordinary manner, as shown in the drawing No. 4, whose apex however is not provided with a top sign, such a one with difficulty living in the ice,

whereas all the staves are close bound with hoop irons, applied in such a manner, as shown in the drawing No. 6, representing a bottle-shaped buoy, on the one side of which the binding is shown as it is applied to the buoys of both sorts, confectioned specially for winter use.

The mooring chain of the iron nun buoys is made of $\frac{1}{2}$ inch chain. The anchor is a cast square iron sinker, weighing about 2,500 lbs.

For the 13 feet nun buoys are used chains of $\frac{1}{2}$ inch in diameter, and for the 9 and 7 feet buoys chains of $\frac{3}{4}$ inch in diameter. The anchor for these marks is a somewhat flat-hewn granite stone, weighing at least 800 lbs.

The mooring chains for the other sea buoys, as for the summer or cask buoys, are $\frac{3}{4}$ inch in diameter, and the stone sinker weighs between 400 and 600 lbs.

For the winter buoys are commonly used $\frac{3}{4}$ inch chains.

The stone sinkers for the floating marks are either provided with an eye bolt, soldered into a hole bored for the purpose, or encompassed with an iron band, provided with an eye for the shackling on of the chain.

No. 7. The buoy for the summer perch buoys is five feet long, its bottom having a diameter of about three feet.

In the lower part of the buoy is a fixed bottom plate adjusted, furnished, as the upright floating 13 feet nun buoys, with holes in the side for the flowing in of the water. Under the summit of the buoy is, moreover, hung up a so-named balance lead of 150 lbs. weight, which ordinarily has the shape as shown in the sketch.

In the log or winter perch buoy the log is not, as before, made of solid wood, but of water-tight fir staves joined together, encompassed with iron bands. By this improvement this floating mark is made lighter and made to ride better.

Of the perch buoys of this description the log perch buoy is the most used, because it costs the least and stands the ice well. The cask buoy is therefore only laid down on spots where the current is so strong as to draw those under, or the bottom so steep, that the log perch buoy at tight mooring is exposed to the risk of being lost.

The length of the perches of the buoys do never exceed 18 feet on the cask buoys, seldom 15 feet on the log buoy.

In the eastern district are used a few iron buoys of the same construction as the Peacock's buoys, but to a lesser scale, for supporting a perch of 18 feet with top signal. The marks ride excellent, but are, however, not to be preferred to the cask buoys, which are very distinguishable and by far less expensive than the iron buoys.

As the log or winter perch buoys are to float with the upper iron band of the cone in the very edge of the water, and thus have to be laid down in a quite tight mooring, their dimensions are to be determined according to the different depths where they are used.

To the one shown in the sketch are given dimensions for a depth of 12 feet, such being the ordinary depth in which perch buoys are applied in the pilot fairways.

In this depth the shackle fitted to the end of the root pole is put directly to the sinker.

Is this sort of perch buoys to be used in depths above 12 and towards 18 feet, only such a length of chain is shackled to as the respective depths exceed 12 feet; but from a depth of 18 feet and above it will be agreeable to the purpose at the same time to make the root pole and the cone each of them two feet longer, and the diameter above of the latter two feet greater than the sketch has it.

Is the perch buoy laid down in more than 24 feet water; it is, moreover, to be observed that the portion of the mooring longer than to a depth of 24 feet be made of rope, that the cone may have the power to bear the weight of the mooring. The rope is then shackled to the chain.

For depths under 12 to 8 feet, the minimum in which marks of this description are laid down, the nature of the ground for the rest being such as to allow of applying poles, from the length of the root pole to the sketch are then to be drawn two feet and from the length of the cone one foot, as the diameter of the cone at the upper edge can be then a couple of inches smaller.

In order to diminish the top heaviness the perch ought to be made a few, at least two, feet shorter, and the portion of the root pole showing above the cone, six inch shorter and $\frac{1}{2}$ inch smaller than shown in the sketch.

To the mooring chain is ordinarily given not above $\frac{3}{4}$ inch in diameter, and the weight of the stone sinker ought not to exceed about 900 lbs.

Concerning the durability of the totality of the floating marks, supposing that they be managed and attended to as intimated above, it may, as to the oaken buoys, especially the larger, be put down to 20 years at least; and as to the winter perch buoys to about 12 years; as to the Peacock's buoys and the iron buoys, sufficient experience is not as yet made in this respect.

The prices, without top signals and mooring apparatus, are as follows:—

	Rdr.
For a Peacock's buoy - - - -	460
„ an iron nun buoy - - - -	470
„ a 13 feet nun buoy of oaken staves - - - -	173
„ 9 „ do. - - - -	150
„ 6 „ do. - - - -	80
„ 4 „ do. - - - -	50
„ 9 feet bottle-shaped buoy - - - -	150
„ 7 „ do. - - - -	120
„ 5 „ do. - - - -	65
„ 4 „ do. - - - -	50
„ a summer perch buoy with bands and balance lead - - - -	80
„ a winter perch buoy - - - -	30 à 40
„ a 9 feet winter buoy - - - -	225
„ 7 „ do. - - - -	180
„ 6 „ do. - - - -	125
„ 5 „ do. - - - -	95

The annual expenditure on the whole floating sea mark establishment in both districts may be put down to the following sums:—

	Rdr.
Administrative cost - - - -	4,470
Local attendance - - - -	6,547
Maintenance of the materials - - - -	12,800
	<hr/>
	23,817

Of which 1,000 rdr. may be put down for salvage money and transport expenses for the picked up marks.

XXIX None of the denoted distinctions prevail in the marking system of the monarchy; but the buoying of the pilot-fairways, and of the entrances to the harbours and roadsteads is ordinarily subjected to the respective pilot stations and harbour authorities, though generally under the control of the buoy inspectors.

As a general rule concerning the marking of the fairways with floating mark, observe—

In the eastern buoy district.

Entering into friths and passages the direction of which is north and south, or east and west, the perch buoys with black or red perches, coming from north or east, according to the direction of the fairway, are kept on the starboard, and those with white perches on the larboard side.

In the "Sound" all the buoys are laid down in the western side of the passages, numbered with white cyphers, as the list shows it.

Where the position of the perch buoy brooms is not mentioned, the brooms are bound upwards.

In the western buoy district, observe :

Entering from the sea into the passages, the black buoys and perch buoys with brooms are kept on the starboard, the white buoys and perch buoys on the larboard side.

The larger poles (spirbaaker) are kept in the same manner.

The passage to Hjertering is in this respect considered as a continuation of Graadyb, and the passage to Romø, Høierløbet, and Listerlei as a continuation of Listerdyb.

The black buoys, only a few excepted, are bottle-shaped, and the white pointed at both ends. The black are denoted with white Roman chifferes, the white with black Roman letters. On the leading marks the name of the inlet for which they are placed, is painted in Roman writing. These signs are applied in such a manner as readily to be seen from passing ships.

In the "Leierue," on the coast of Sleswick, the smaller poles (stikbaaker), coming from south are kept on the larboard hand. The entrance-pole for each "Leie" is marked with two brooms set horizontally.

A seamark having a balloon as top sign, the diameter of which being under $\frac{1}{2}$ foot, the same in the list is called "kurv" (basket).

In the passages within the islands winter buoying is not kept; the poles, however, remain out, and are completed in the spring as far as they during the winter have been cut away by the ice.

The sands in this buoy district being frequently subjected to small alterations, one or more floating marks must very often be removed into other landmarks, hence the positions of the floating marks given in the list are not quite permanent.

4. The papers in original of which the translations sent are printed.

XXX. See the annexed drawings and description.

XXXI. Copies of instructions for the light and floating sea-mark establishment, with regulations for the management of the lights herewith annexed.

Note.—These instructions are preserved with the original papers.

b. Floating Lights.

I. Annexed three drawings litr. A, B, C, of the newest Danish lightship, showing,—

a. The hull, as coloured, its dimensions and lines, with sections showing the internal arrangements.

b. Its draught of water.

c. Its masts.

d. Its moorings.

e. The method of mooring.

d. and e. The moorings consist of mushrooms anchored to 3,300 lbs., with 165 fathoms $1\frac{1}{2}$ inch chain, divided for convenience into 15 lengths, these lengths are shackled together in the customary way; to each mooring belongs a buoy chain $\frac{3}{4}$ inch in diameter, in order that the anchor may be weighed through it—further an iron buoy.

f. The illuminating apparatus in position.

The apparatus shown in the drawing is a new one, and of English construction, with eight parabolic silvered reflectors. The most ancient apparatus as yet in use in two of the Danish lightships are composed of many small common lamps, each provided with a small brass concave reflector, and swinging by balance-rigs, in a simple copper lantern c. 18 inches high. The lanterns are placed together, one close to another, in an iron basket surrounding the mast.

g. The mode of suspending the lantern, and

h. The mode of suspending the lamps is shown in the sketch.

II. a. The name of the lightship is “Kobbergrundten,” and its position, latitude $57^{\circ} 8' 30''$ N., longitude $11^{\circ} 20' 30''$ E. of Greenwich, in the Kattegatt, south of the ground of the same name. All the lightships being named after their respective stations, whose site the list shows.

b. The hull is oak, copper bolted and coppered.

c. See the list of lights.

d. The vessel is fitted with four sails, see the sketch.

e. Two common anchors weighing 900 lbs., with two lengths 90 fathoms 1 inch chain. In case of the moorings parting, the ship has either to seek the nearest harbour until new moorings can be sent her, or she may anchor at her ships' anchors.

f. The stations of the lightships are too isolated as to hold communication with the shore by any sort of signalling, the necessary communication being performed through their own tenders, of which each ship has two, or through coasting vessels in regular turns, paid by contract.

g. No life-boats attached.

h. Each ship has a crew of 10 men, master and mate inclusive.

i. Relief takes place only at the end of the station year, and is voluntary.

j. From the first days of March to ult. December, if frosty weather not forces her to quit the station sooner. Such is the station time for all the lightships, except the one stationed in “Læsø Rende,” and in the “Drogden,” that remain at the station as long as the ice shall permit.

k. The consumption of oil averages annually 2,900 potts and of wicks 210 ells.

III. a. The cost of the hull of the lightship averages 36,455 rdlr. 64 sch.

b. The cost of the illuminating apparatus with appurtenances is 8,314 rdlr. 83 sch.

c. The cost of the vessel, when complete for service, exclusive of victualling and lighting stores, also exclusive of light-apparatus, is 49,833 rdlr. 11 sch.

d. The annual cost of oil averages 1,200 rdlr., and of wicks 25 rdlr.

e. The annual cost of repairs to illuminating apparatus averages 80 rdlr.

f. The estimated annual expenditure on maintaining the floating light in a state of complete efficiency in a period of eight years, is about 1,500 rdlr.

g. The scale of wages paid to the crews accommodated to the actual one in the merchant shipping, which at present is as follows, per month:—

1 Carpenter - - 20 rdlr.

1 Cook and sailor - 16 „

5 Sailors a 16 rdlr. - 80 „

1 Boy - - 12 „

128 rdlr. monthly.

h. The annual cost of victualling averages 960 rdlr.

IV. In the last five years, the following lightships have been forced to quit their respective stations, viz.:

The lightship in the Læsø Rende, three times.

„ Knobten (Anholt), once.

„ Kobbergrundten, three times.

The moorings having parted, always in rigorous weather, and on autumn or winter days.

Copenhagen, Marine-Ministry,
Admiralty Department, March 23, 1860.

BÖCHER.
SUENSON.

Note.—This return was accompanied by books marked—

1. Fortegnelse over Söimerkerne i det Danske Monarki, &c., 1855, which contains a list of sea marks.

2. Fortegnelse over Fyrene i det Danske Monarki, 1854, which contains a list of lights.

3. Books containing regulations for inspection, cleansing of apparatus, and general service; and

4. The papers in original of which the translations sent are printed.

10.—RUSSIA.

The Russian Hydrographical Department has the honour to forward the informations about the White Sea light-houses. The difficulty is in the translation, but if the reports about the state of the light-houses can be of any use, sent to the Royal Commission as they are, in the Russian language, they may be sent immediately.

Note.—The Return was accompanied by drawings of buoys and beacons, but as there appeared to be nothing unusual in their form or construction the drawings are not inserted. They will be preserved with similar documents.

INFORMATIONS ABOUT WHITE SEA LIGHTHOUSES.

I. The Superintendent of White Sea light-houses is a naval officer, subordinated to the Commander of the port of Archangel, and his technical part dependent from the Hydrographical Department.

The keepers are selected from the officers of the pilot corps.

II. All the materials are bought on the sums of Navy Department. The cost of maintaining them in the year 1858 is,—

By contract.		£	s.	d.	
By contract.	Grease, 2,628½ lbs., cost	-	34	10	0
	164 glass tubes, 6d. each	-	4	2	0
	White kid leather	-	1	8	0
	Linen, 60 yards, for towels	-	0	15	0
	Wine and spirit for clearing tubes and lantern	-	0	15	0
	Cotton wicks, 235 dozens	-	1	10	0
	Cloth	-	0	4	0
	Hempseed oil, 2394½ lbs.	-	38	12	0
	Soap, 26 lbs.	-	0	2	0
	Black cement, 20 lbs.	-	0	1	6
	White rosin, 5 lbs.	-	0	0	4
	Turpentine, 4 lbs.	-	0	1	6
	White lead, 25 lbs.	-	0	12	0
	Chalk	-	0	1	6
Lead in pieces and in sheets, 30 lbs.	-	0	15	0	

	£ s. d.
Pewter, 10lbs. - - -	0 14 0
Sal ammoniac, 5lbs. - - -	0 2 6
Iron wire - - - - -	0 0 10
25 barrels for grease - - -	1 9 0
26 iron lamps - - - - -	0 16 0
2 pumps - - - - -	1 2 0

To remount the refractors a sum of 7l. 16s. is annually paid.

III. There are four lighthouses in the White Sea: Mondinga, Tijginsk, Morjovski, and Orloo.

VI. There is one keeper in each lighthouse, selected from the pilot corps officers; their salaries are from £60 to £70.

VIII. All are fixed.

IX. Colours are white.

XV. The extreme height above the level of the sea is 200 feet; higher, for many climatical reasons the light is badly seen.

XVII. From 1st August to 1st October the oil generally burned is fish and animal grease, and from 1st October to the end of navigation hempseed oil.

XVIII. Grease, well cleaned, burns well; costs about 14s. for a pood (40 pounds); in 10 lamps burns about a pound an hour; but at a low temperature the grease becomes too thick, and therefore from the 1st October they burn hempseed oil, which costs 4d. a pound.

XIX. The lighthouses in the White Sea were constructed by contract, but all the repairs are made by the Government workmen.

XX. Oil and grease are tested by burning them in the lamps.

XXI. The lighthouses are painted every year, or every two years. The buoys are painted every year with oil paint.

XXII. Entering from sea the red beacons are left to the right, and black to the left.

XXIV. The following instruments are in the four lighthouses: one barometer, one thermometer, one compass, one eye-glass, one artificial magnet, and instructions for making meteorological observations.

XXVI. At Orlov lighthouses, where the fogs are often seen, a bell is applied to the tower, which is heard in calm weather at 12 miles from the lee side.

TABLE.

WHITE SEA LIGHTHOUSES.

Moudiuga, with 14 lamps.	Price.	Ordinary repairs.	—
		Oil	{ Consumption - 11 gallons.
	{ Cost - 1l. 16s. 18d.		
	Wicks	{ Consumption - 5½ dozens.	
{ Cost - 9½d.			

From 1st August to 1st October, during 606 hours 41 minutes, is lighted by fish-oil, and from 1st October to 1st November, 470 hours 5 minutes, during the cold weather, with hempseed oil.

Tijginsk, with 16 lamps.	Price.	Ordinary repairs.	—
		Oil	{ Consumption - 13½ gallons.
	{ Cost - 2l. 4s. 2d.		
	Wicks	{ Consumption - 6½ dozens.	
{ Cost - 10½d.			

From 1st August to 1st October fish-oil grease; from 1st October to 16th November hempseed oil.

Morjovetz, with 7 lamps.	Price.	Ordinary repairs.	—
		Oil	{ Consumption - 6½ gallons.
	{ Cost - 1l. 0s. 10d.		
	Wicks	{ Consumption - 2¾ dozens.	
{ Cost - 4½d.			

From 1st August to 1st October fish grease; from 1st October to 1st November hempseed oil.

Orlov, 15 lamps.	Price.	Ordinary repairs.	—
		Oil	{ Consumption - 12½ gallons.
	{ Cost - 2l. 1s. 8d.		
	Wicks	{ Consumption - 6 dozens.	
{ Cost - 10½d.			

11.—HOLLAND.

(Translated from the Dutch.)

STATEMENTS relative to COAST LIGHTS and placing BUOYS and BEACONS in the NETHERLANDS.

I.—COAST LIGHTS, BUOYS, and BEACONS.

I. The management of the coast lights, buoys, and beacons is solely in the hands of Government.

This management rests with the minister for the marine, under whom there is an inspector general and seven inspectors (in as many districts) who are charged with the direction and superintendence of this branch of the service. They are responsible to the before-mentioned minister.

II. The costs for the construction and maintenance of lighthouses, floating lights, buoys, and beacons are placed yearly on the list of Government expenses.

The material costs of maintenance amounted in 1858 to:—

a. Lights	f. 55,958
b. Buoys	34,050
c. Beacons	4,700

III. A list of the coast and shore lights is herewith annexed under letters A. and B.

IV. In the selection of positions for lighthouses, the principle is generally adopted that the coast lights should, in the first place, be fixed in positions the most important to mariners as points of observation on shore, and, in the second place, be connected with the buoys which point out the entrances from the sea.

On account of the numerous lights on the coast of the Netherlands, which are placed in such a manner that the circle of lights intersect each other, or at least touch upon one another, there is no necessity for floating lights in the outer roads or neighbourhood thereof. They might easily become confused with the

lights on the coast, or be placed too far within the circle of lights of one or other of the coast lights, and where they would be entirely superfluous.

But it has been long the conviction in the Netherlands that it would be of great service to navigation in general to place a floating light in the North Sea near the North Hinder Bank, eight leagues to the westward of the West Kapelle coast light.

In 1858 the North Hinder floating light was placed. It furnishes in that position a most excellent point of observation for the passage of vessels which are proceeding from the North Sea to the English Channel and back; and it is further serviceable for touching at the coast of Holland and the sea entrances further to the southward; its circle of light joins that of the large coast lights there.

V. In the Netherlands the following classification of lights exists, viz.:—

- a. Coast lights.
- b. River and shore lights.
- c. Harbour lights.

The harbour lights, generally speaking, are only of local importance, and are excluded from the cares of Government, appertaining to the direction of the authorities of the community where they are situated.

In this respect an exception is alone made when a harbour light is at the same time required for tidal navigation.

(See the Lists A. and B. mentioned before in Article III.)

VI. In providing for the necessary service two or three keepers are placed with each light, under one foreman, who is responsible for the proper care of the light to the inspector of the district who has the management of the lights.

- Each river or shore light is attended by one keeper, under the superintendence of the inspector of the district.
- The foremen receive a salary of from f. 500 to f. 800 annually, with an addition of f. 50 annually for management expenses.
- The keepers from f. 250 to f. 350 annually.
- The foremen and keepers have generally the privilege of a free residence.
- VII.—X. For the purpose of distinguishing the coast lights there are two kinds,—fixed lights and revolving lights, as mentioned in the lists under Article III.
- Flashing lights and coloured lights are not made use of along the Netherland coast.
- XI. All the coast and inner lights, revolving as well as fixed, are catadioptric, dioptric, or catoptric, as mentioned in the lists in Article III.
- The preference is given in this country to the catadioptric apparatus for lights.
- XII., XIII. This apparatus is manufactured and furnished by Mr. Henry Lepante, of Paris, according to the model by Fresnel.
- The required statement, filled up, is annexed under letter C.
- XIV. In order to make the improvements available which have been introduced from time to time in the apparatus for lights, they renounced the catoptric apparatus in the Netherlands for the dioptric, and then employed the catadioptric.
- XV. Sixty Netherland ells (mètres) above the level of the sea is considered to be the extreme height which should be given to a coast light; although a height of forty-five ells (mètres) is usually considered sufficient.
- XVI. The best mode of ventilating the lanterns of the coast lights is considered and carried into practice by the introduction of air-holes into the lantern foot of those lights which light up to the entire horizon, and of brass ventilating slides (according to sketch under letter D.) in the dark divisions of lanterns for lights which light up only a portion of the horizon.
- XVII. Purified rapeseed oil (patent oil) is used for the lights.
- XVIII. No other kind of lights is made use of for Netherland coast lights.
- XIX. a. The rule is that the construction of lighthouses, with the magazines and dwelling houses, according to a statement and drawing furnished, is publicly disposed of; a mode of proceeding generally employed in Government works, and has produced a good result, because the execution thereof takes place under intelligent and careful superintendence by practical men.
- The same method is resorted to for obtaining beacon tops.
- A statement is annexed, under letters E and F, of the usual conditions by public tender for the various contracts, and for the construction of Government marine works.
- The stipulations are usually made with respect to the nature of the works.
- The North Hinder floating light vessel was built on one of the Government wharfs. The same with the vessel in reserve.
- The beacon buoys are constructed by and under the supervision of Government. At a former period the attempt to allow private persons to execute the work produced no good results.
- b. The illuminating apparatus for the lanterns of the coast lights are purchased in other countries. (See the reply to articles 12 and 13.)
- The lanterns for the coast lights are manufactured in the Netherlands.
- The apparatus and lanterns for the floating light, as well as for the vessel in reserve, were manufactured and furnished by W. Wilking, manufacturer, in London.
- c. In regard to the necessary maintenance of the works, amongst which painting is included, the contract is granted by public tender (as mentioned under a).
- d. The stores are partly furnished from the marine magazines, partly bought of private individuals.
- e. Organic lamps as well as reflectors for the illuminating apparatus are also manufactured in the Netherlands in a very satisfactory manner.
- XX. The oil is tested as well by burning as by examination into the weight of similar qualities by means of the arcometer.
- Other stores are tested by comparing them with the patterns and models on hand.
- XXI. Iron lighthouses are painted every other year; wooden structures for lights every three years; floating light vessels yearly; buoys and beacons twice a year. The materials for paint consist of white lead, yellow ochre, red lead, vermilion, and blacking [lamp-black].
- XXII. Iron lighthouses are painted the colour of Benthem stone; iron supporters for lights are painted black; wooden structures for lights, a bright yellow; and the lanterns for the coast light are red outside and black inside.
- The principal colours for buoys in the channels leading to the entrances from the sea are black, white, and red.
- XXIII. When proposals are made for the introduction of improvements in the coast lights, buoys, &c., the minister for the marine gives orders for an inquiry to be made by practical men, who make a report to him of the result.
- XXIV. On each of the coast lighthouses are placed a thermometer; on board the floating light a set of meteorological instruments, viz., a barometer, a set of dew point hygrometers, a psychrometer, and a deep sea lead, with two thermometers.
- XXV. The system mentioned here is not adopted in the Netherlands. Under certain circumstances alone, signals are made with flags and streamers by pilot vessels, to indicate at certain periods the height of the water in shallow parts of the entrances from the sea.
- XXVI. In thick foggy weather the usual signals are made on board the floating light by sounding the bell, preceded and followed by striking on the gong.
- If any vessel, by pursuing a wrong course or otherwise, should be in danger of the sand banks, it shall be made known, in as far as possible, from the floating light, by firing a gun and hoisting signal flags.
- Under letters G and H are annexed the Royal Decrees of the 28th June, 1858, (State newspapers Nos. 54 and 55.) concerning the exhibition of signal lights at night, and also the making of fog signals for the prevention of collisions.
- XXVII. In reply to the request made under this head, there are annexed hereto three sets of drawings (Appendix, letter L.) of the last constructed lighthouse, with a statement (Appendix, letter K.) showing the particulars described, under letters a and f.
- XXVIII. A drawing of the beacon buoys in use is herewith annexed under letter L., with a statement (Appendix, letter M.) showing the size of the buoys, the materials of which they are made, and the ground tackle by which they are moored.
- As the size of the buoys differs greatly, and the ground tackle should be proportioned to their formation, and to the depth of the channels where they are placed, it is not possible to make a statement of the costs.
- XXIX. Coming from the sea the white buoys are on the starboard side, and the black ones to larboard.
- Red buoys are placed at the separation of two channels.
- White and black in squares are buoys painted for the purpose of pointing out wrecks.
- The objects for beacons placed along the outer roads of the sea entrances, such as the Flaaks, the Ooster, the Banjaard, are painted with vertical or horizontal black, white, or red streaks.
- The names of the sand banks are painted on the buoys.
- XXX. Along the Banjaard are two iron Herbert's buoys (iron inverted cone buoys) as per drawing, letter N.; near the Schouwen Sandbank there is an iron bell beacon vessel (iron bell beacon buoy), as per drawing, and statement letter O. (See likewise the annexed notice, dated the 3th August 1858, under letter P.)
- Before the mud entrance (slykgat) of Godereede and the shell entrance (schulpengat) of Texel there is a Peacock's life buoy, but which kind of object for beacons, with regard to its stability, has furnished fewer good results.
- XXXI. A copy of the instructions for the management of the coast light on West Schouwen is hereto annexed under letter Q.
- There are no general instructions for the district inspectors. The regulations of the service conform to the local circumstances of each district. Those given to the inspectors of the first district are copied and annexed under letter R.

Besides the inspection of the district inspectors a general inspection is made by the inspector general at times not appointed.

The maintenance of the buoys and beacons in the channels takes place by contract with parties who moor the buoys, and who are bound to provide a vessel with her crew fitted for the purpose on their own account, but who receive the materials for the buoys from the Government magazines.

II. FLOATING LIGHT NEAR THE NORTH HINDER BANK.

I. The drawings of the floating lightvessel De Noord Hinder are annexed hereto as an Appendix, letter S., pointing out at the same time the particulars as required in *a, b, c, f, g.*

Under *d* and *e.* The vessel lies moored to a mushroom anchor of 1,800 Netherland lbs., and a chain cable of 0,038 Netherland ell, veering out according to circumstances 275 Netherland ells (150 fathoms) with a depth of water of 40 Netherland ells (21 fathoms).

Under *h.* The light is according to Wilking's system.

II., *a.* The floating light vessel is named Noord Hinder, and lies near the sandbank of the same name in the North Sea.

(See the annexed notice, dated the 26th August 1858, under letter T.)

b. She is built of timber, and copper fastened.

c. See the notice under letter T.

d. See the drawing.

e. Two bow anchors, one of 953 and the other of 865 Netherland lbs.; one of them provided with a chain cable of 0,032 Netherland ells, the second with a chain cable of 0,029 Netherland ells, each of them being 200 Netherland ells in length.

f. Some of the signals are arranged between the floating light and the pilot boats.

g. No other than the usual boats, amongst which there is one whale boat.

h. The crew consists of thirteen men, of whom there are always eight on board.

i. The masters and the mates are relieved every month, the keepers every two months.

j. The floating light has not yet been placed there a year. Experience must show within what time she ought to be replaced.

k. The consumption of oil is calculated at 1800 Netherland cans per year.

III. The costs are,—

a. For the hull, f. 53,000.

b. The illuminating apparatus and the lanterns, f. 5,256.

c. For the vessel entirely ready for service, excepting provisions and materials for lights, f. 77,500.

d. Yearly costs for oil and wicks are calculated at f. 900.

e. The annual costs of maintenance of the illuminating apparatus.

(Have not yet been furnished.)

f. The vessel has been too short a time in the service to give an estimate of the costs here alluded to.

g. The wages of the crew are as follow:—

	frs.
1 Chief master, per month	110
1 Second ditto „	100
2 Mates, each „	70
6 First keepers, each „	45
3 Second do. „	35

All of them with free maintenance on board, without any extra addition.

h. The annual costs for provisions furnished by Government are calculated at 2,500f.

APPENDIX, STATEMENT A. and B.

- The price of the illuminating apparatus in use, including therein the costs of the optical and organic portions of each kind, with the description.
- The calculated annual costs of the usual repairs, including therein the lamp-glasses, wear and tear and breakage, with the cleansing of the materials employed.
- The consumption and costs for oil and wicks in a certain number of hours. The price of the oil is placed at 40 pence per gallon (the gallon at 454 Netherland cans).

Description (Dioptric, Catoptric) stating the order and number of Lights.	Description.						Fixed Illuminating Apparatus.			Revolving Illuminating Apparatus.				
	Fixed.	Flashing.	Fixed and Flashing.	Continuous.	Shifting.	Revolving.	Costs of the			Costs of the				
							Optical part.	Organic part.	Requisite materials.	Optical part.	Organic part.	Requisite materials.		
Price:	f.					f.	f.	f.						
1st size	15,373	Lighting	270° of the horizon.	-	-	31,000	11,788	2,376	809					
2d „	10,585	„	270° „	-	-	25,000	7,944	2,405	637					
3d „	4,924	„	245° „	-	-	not used	3,260	1,275	388					
4th „	1,022	„	270° „	-	-	2,640								
The usual annual repairs and other costs:														
1st size	350	-	-	-	-	350								
2d „	150	-	-	-	-	150								
3d „	160	-	-	-	-	160								
4th „	73	-	-	-	-	73								
Consumption of oil:														
1st size	83 cans in 100 hours.	-	-	-	-									
2d „	48 ditto	-	-	-	-									
3d „	20 „	-	-	-	-									
4th „	07.5 „	-	-	-	-									
Cost of the oil:	f.													
1st size	33.24 in 100 hours.	-	-	-	-									
2d „	21.37	-	-	-	-									
3d „	8.81	-	-	-	-									
4th „	3.30	-	-	-	-									
Consumption and cost of wicks:	Netherland Ells in 100 hours.	Cost in f.												
1st size	0.352	0.78												
2d „	0.386	0.63												
3d „	0.256	0.22½												
4th „	0.085	0.64												

The consumption of oil for the revolving lights is equal to that of the fixed lights.

In the Netherlands fixed and revolving illuminating apparatus is only made use of. The costs of the optical and organic part of the revolving as well as the fixed illuminating apparatus of the 4th size cannot be separately stated, not having been given in detail by the contractor.

*With the Lanterns.

APPENDIX, LETTER K.

STATEMENT regarding the particulars under letters a, f, appertaining to the reply to Article No. 27.

a. Building Materials:—

1st. Stone Coast Lighthouse on Schiermonnikoog.

Situation	-	-	On a down.
Foundation	-	-	Freestone flags, masonry, and brickwork.
Lighthouse	-	-	Brickwork carried up outside; inside plastered and white-washed.
Staircase	-	-	Of cast iron.
Foot of lantern	-	-	Of freestone.
Gallery	-	-	Of freestone.
Floors	-	-	Of freestone. The tiles rest on brick joists inserted between binders of wrought plate iron.
Ballustrade and rails	-	-	Of iron.
Doors and cupboards	-	-	Of wood.
Frames	-	-	Of iron.
Lanterns	-	-	Of copper.

2. Stone Coast Lighthouse on West Schouwen.

Foundatain on piles	-	-	Of deal piles.
Lattice work	-	-	Of fir deals.
Foundation masonry	-	-	Of brickwork.
House and walls	-	-	Of brickwork.
Lighthouse	-	-	Plastered outside with Portland cement.
Lighthouse and walls	-	-	Plastered inside, and white-washed with the usual materials.
Staircase	-	-	Of freestone, but in the two upper compartments, of iron.
Foot of the lantern	-	-	Of freestone.
Gallery	-	-	Of freestone.
Floors	-	-	Of freestone. The tiles of both the above floors rest on iron plates, and these on cast iron girders.
The ballustrade and rails	-	-	Of iron.
Doors, frames, and cupboards.	-	-	Of wood.
The covering of the magazines.	-	-	Of lead.
Lanterns	-	-	Of copper.

3. Iron Coast Lighthouse on North Schouwen.

Situation	-	-	On a down.
Foundation	-	-	Of freestone, flags, and masonry of brickwork.
The lower portion	-	-	Of freestone.
The lighthouse	-	-	Of cast iron, painted outside and inside.
Staircases	-	-	Of cast iron.
Foot of the lanterns	-	-	Of cast iron.
Gallery	-	-	Of cast iron.
Floors	-	-	The bottom one of freestone, the rest of cast iron plates, but the upper ones covered by tiles.
			There are no girders made use of, except under the uppermost floor, which are of cast iron.
			The floor plates have edges fastened to each other by screw bolts.
Bullustrade and rails	-	-	Of wrought iron.
Doors and frames as well as the magazine.	-	-	Of iron.
The cross beams	-	-	Of cast iron.
Cupboards	-	-	Of wood.
Lanterns	-	-	Of copper.
			The lighthouse is secured at bottom with screws; the foundations are joined together by screw bolts of wrought iron.

b. Situation of the oil magazine:—

Shown in the drawing under letter I.

The apparatus:	1 reflector	} Illuminating apparatus of the 1st size (on the west-coast of Schouwen.)
	1 large lens	
	1 small lens	
	6 reflectors	
	3 laups	
	4 wickholders	

The costs of maintenance of the lighthouse on West Schouwen, including therein the customary expenses, amounted in 1858:—

For repairs	-	-	f. 600
For materials for the lights	-	-	764
For oil for the illuminating apparatus and the keepers rooms	-	-	2,175
			<u>f. 3,535</u>

e. Vide Statement under letter C.

f. The costs of the whole construction of the lighthouses, keepers dwellings, lanterns, apparatus for light and other materials, amounting, up to the first beginning of the lights:—

For those on Schiermonnikoog (two lighthouses)	f. 119,596;
Schouwen (west side),	f. 160,223;
Schouwen (north side),	f. 37,860.

APPENDIX, LETTER M.

STATEMENT appertaining to the Reply to Article No. 28 respecting the Beacon Buoys now in use.

Anchor-formed Buoys.

Description.	Length without the lower part.		Outside diameter.	Thickness of the sides.		Thickness of the bottom.	Remarks.
	Ells.	Ins.		Ells.	Ins.		
No. 1	5-00	2-00	2-10	0-034	0-035	Has 2 bottoms	
" 2	4-00	1-50	1-75	0-030	0-035		
" 3	3-00	1-30	1-32	0-025	-	} Are made without bottoms.	
" 4	2-60	1-00	1-27	0-020	-		
" 5	2-10	0-55	1-10	0-015	-		
" 6	1-55	0-60	0-78	0-012	-		
" 7	1-20	0-50	0-57	0-011	-		

Bulging-formed Buoys.

Description.	Length.	Outside diameter.	Thickness of the sides.	Thickness of the bottoms.
				Ells.
No. 1	2-50	1-50	0-140	} 2 bottoms, viz.: 1 thick 0-045, 2 thick 0-030.
" 2	2-20	1-65	0-040	
" 3	2-40	1-50	0-040	} 2 bottoms, thick, 0-010.
" 4	2-15	1-35	0-035	
" 5	1-90	1-20	0-035	
" 6	1-70	1-05	0-035	
" 7	1-50	0-90	0-032	
" 8	1-20	0-72	0-030	

The buoys are made of Rhenish wainscoating, and bound according to Drawing.

They are moored to usual buoy chains of the thickness of 0-032 to 0-013 ells, and the chains are anchored to single cast iron sinkers of 1,580 Netherland lbs, and generally to blocks of freestone of from 1,300 to 200 Netherland lbs., according to the size of the buoys and the depth of water wherein they are moored.

LIST OF THE DOCUMENTS NOT TRANSLATED.

- Appendix, Letter A.—Coast lights in the kingdom of the Netherlands.
- Appendix, Letter B.—River and shore lights in the kingdom of the Netherlands.
- Appendix, Letters E. and F.—General conditions for goods and materials for Government marine by public tender.
- Appendix, Letter F.—Notice to mariners by the Department for the Marine.

- Appendix, Letter G.—Government newspaper of the kingdom of the Netherlands, No. 51, containing a decree of 28th June 1858 (regulations for signals by night and fog signals), for the prevention of collisions.
- Appendix, Letter H.—Government newspaper of the kingdom of the Netherlands, No. 55, containing a decree of 28th June 1858, respecting the carrying of lights by steamers, &c.
- Appendix, Letter O.—Statement and conditions for building an iron bell beacon vessel.

- Appendix, Letter P.—Notice to mariners of the Marine Department regarding the bell beacon vessel in the North Sea near the Scouwen sand bank.
- Appendix, Letter Q.—Revolving coast light of the 1st size of West Scouwen, containing instructions for management of the lights, and the maintenance of the illuminating apparatus, and the lanterns.
- Appendix, Letter R.—Containing instructions to the Inspector of Pilots of Buoys and Beacons and Lights in the 1st district.

12.—BELGIUM.

The following is a translation of the return made by direction of the Belgian Government.

NOTE on the lighthouses (phares) and harbour lights (fanaux) of Belgium.

I. The construction of lighthouses and harbour lights is part of the general administration of roads and bridges, (ponts et chaussées), under the superintendence of the Minister of Public Works. An annual sum is carried to the budget of that department for the maintenance of the apparatus, the painting of the buildings, habitations of keepers, &c.

The "exploitation" of lighthouses, that is to say, their illumination, depends on the general direction of the navy, to which the lighthouses are handed over, when the administration of roads and bridges consider that they fulfil all the required conditions before they are put in action.

The general direction of the navy is under the orders of the Minister for Foreign Affairs.

The "budget" of the navy includes each year the sum necessary for the illumination of the lighthouses, and for the payment of the persons concerned.

The lighthouses of the coast of the North Sea are under the authority and the superintendence of the inspector of pilotage resident at Ostende. The floating light "Paarde Markt" is under the direction of the sub-inspector of Belgian pilotage, residing at Flesingen.

The inspectors of pilotage ought to assure themselves that the harbour lights are lit at the hour prescribed, and that they produce a clear and suitable light.

The subordinate staff of the lighthouses, such as keepers, watchmen, and others, is subordinate to them, and they have the right to suspend them for five days.

Heavier punishments are inflicted by the general director of the navy, under a revocation which can only be pronounced by the minister.

The buoys also form a part of the pilotage service.

The State directs the placing and maintenance by means of the inspectors of pilotage.

There are no beacons (balises) on the coasts of Belgium.

II. The "budget" of the expenditure of the Ministry of Foreign Affairs for 1858 contains the following allocations for the maintenance of lighthouses and harbour lights during the same "exercice."

"Personnel" (officers) on the coast of Flanders	- 6009
On board the floating light "Paarde Markt"	- 7050
	<hr/>
	13,059

Materiel.

Lighting of the lighthouses and harbour lights on the coast of Flanders	- 3500
Ditto for the floating light "Paarde Markt"	- 3500
	<hr/>
	7000

The budget of the Minister of Public Works includes the maintenance of buildings for watchmen, &c., a sum of 1,000f.

The budget of the Minister of Public Works provides for the maintenance of buildings, keepers' houses, &c., a sum of 1,000f.

III. Here follows a list of lights, with a description of each, similar to the Admiralty list of lights.

VI. The existing light at Ostende has two keepers, whose annual pay is 840f.

Fanaux have but one keeper, whose pay varies from 540f. to 1,200f.

VIII. The lighthouse at Ostende has a fixed light.

IX. The colours adopted for the little fanaux are three in number,—natural, green, and red colours.

XI. The apparatus of the lighthouse in construction is dioptric

XII. A drawing of the apparatus can only be furnished when the new light at Ostende is constructed.

XIII. The light at Ostend and the little fanaux of the coast of Flanders burn "l'huile à quinquet" (oil for Argand lamps), perfectly purified.

The annexed note of charges contains all the elements for the valuation of the different objects provided for the service, oil, &c.

In all that concerns the floating light, details will be found in accordance with the programme furnished by the Royal Commission.

XVII. The oil which is used is oil doubly purified, like that commonly sold under the name of superfine oil, destined for carcel lamps.

XVIII. Oil only is used.

XIX. *a.* Buoys in Belgium are made of iron, under estimates.

b. Lighthouse apparatus is not the object of an adjudication.

The department of Public Works addresses itself to the makers who seem to offer the best guarantee.

c. Painting is done by public adjudication.

d. Materiel is also furnished by public adjudication.

The law in Belgium requires that all provisions shall be made in this manner.

XX. A commission of three or of five members in certain cases; the inspector of pilotage examines and admits or rejects the materials.

XXI. They are painted with oil paints, generally once a year. The parts which are of iron are painted in "minium."

XXIII. Propositions of this kind are submitted to an inquiry by Government. The departments of Foreign Affairs and of Public Works consult together when it is proposed to change the lighting of the coast.

XXIV. The meteorological observations are made in the lighthouses.

XXV. The state of the tide is indicated.

XXVII. There is but one apparatus of first order in Belgium, and beside it is in course of construction.

The information asked in No. 27. can only be furnished when it shall be finished.

XXVIII. The buoys which are used in Belgium are not placed at sea, but in the interior, and in the Belgian portion of the Scheldt.

XXIX. The buoyage of the Scheldt is done by common agreement with the Netherlands. The buoys are black, when the navigators ought to leave them to port in coming from the sea; white when under the same circumstances he should leave them to starboard. Only a few red buoys are used as yet, when the navigator may pass them indifferently to port or starboard.

XXX. The general order for the floating light service is annexed, as also the journal to be kept on board.

Reply to the questions asked by the Royal Commission relative to floating lights in Belgium.

Belgium has but one floating light moored passage of Wichingen, near Paarde Markt.

- a, b, c* These questions are answered by the plan sent herewith.
- d, e* The mooring apparatus is composed of two anchors, of the weight of 17 quintals English, joined by a ground chain of 1½ inch English by 70 fathoms long.
- In the middle of that chain is a swivel, to which another chain is rivetted, of the same diameter, and of 120 fathoms long, passed through the hausehole, fixed to the windlass and finally in the chain well. It is hauled in and paid out as circumstances require. The lantern was made by Mr. Robert Wilkins and Son. Its diameter is six English feet; it has eight silver lamps, and shows a red light.
- g* The lantern is hoisted to the mast in the ordinary manner by means of two chains, which pass through two blocks under the cross-trees, and which join and end in a single chain fastened to a hand-winch placed on deck.
- h* The lamps turn on a universal joint, called cup and ball gimble principle.
11. *a* The vessel has no other name but that of the floating light of Paarde Markt.
- Its position has been shown by the reply to No. 111, which includes a list of lights in Belgium.
- c* The light, which is of a red colour, can be seen by the naked eye by an observer placed at 18 feet above the level of the sea, in clear weather, at a distance of 8 miles, of 60 to a degree.
- d* The vessel is provided with a lantern mast and a large lug sail and a mizen.
- e* A chain of 1½ inch English by 90 fathoms, and an anchor of 18 English quintals, are kept in reserve to replace the mooring apparatus, if it should happen to give way.
- f* The vessel is provided with a series of signals, by means of which it communicates with the coast.
- g* A lifeboat which cannot be sunk is placed on the deck.
- h* The crew is composed of eight men; of whom four in summer and five in winter are always present on board.
- i* The master and the mate pass, turn about, a month on shore, and a month on board. The sailors remain on board two months out of three. A supplementary sailor is engaged for the winter months from October to the end of March.
- j* The vessel quits her station every two years during 10 days, to have her bottom scraped, cleaned, and repainted. The end of June is chosen for carrying out this work, or the first days of July.
- k* The illuminating apparatus consumes yearly about 1,600 litres of superfine colza oil, specially purified for carcel lamps, and wicks in proportion.
111. *a* The price of the hull alone is 41,000 f.
- b* The illuminating apparatus, with blocks, chain, and accessories, cost 11,325 f.
- c* The total price of the floating light ready to enter the service, but without oil and stores, was 74,213 f.
- d* The annual expenditure of oil and wicks amounts to about 2,050 f., of which 1,989 is for oil, and 61 for wicks.
- e* The floating light has been in use since 1848. The apparatus has had no need of repair up to this time.
- The lamp glasses which are broken are not included under the head of repairs.
- f* The works necessary for keeping the floating lights in perfect condition do not amount to 1,000 f. in the mean, by the year.
- g* The pay of the master by the year is 1,320 f.
- | | | | | |
|-----------------------------|---|---|---|-------|
| The mate | - | - | - | 1,140 |
| Sailors of the first class | - | - | - | 1,020 |
| Sailors of the second class | - | - | - | 840 |
- They receive besides a certain quantity of victuals
- h* The cost of these provisions is 1,650 f. on a mean by the year.
- IV. The floating light has occupied her station from the end of 1848, and has never quitted it in consequence of any accident.
- In February 1855 the vessel was obliged to take refuge at Ostende, in consequence of ice; but she resumed her moorings some days afterwards.

13.—AUSTRIA.

COMMUNICATION ON LIGHTS, BUOYS, AND BEACONS, ON THE AUSTRIAN COASTS.

- I. The superintendance of all the lighthouses, buoys, and beacons belongs to the Imperial Royal Admiralty.

The deputies of the Exchange at Trieste have to attend to the management of the lighthouses, and they have to give their inferiors instructions in their sphere of action.

The duties of the deputation of the Imperial Exchange extend themselves to the erection of the lighthouses, the repairs of the same, the pay of the men who are employed, and the discipline of them; their rights, on the other hand, consist in the collection of the legitimate lighthouse taxes and in the appointment of their own men.

The inferiors of the Admiralty have to attend on their own responsibility to the superintendance of the buoys and beacons.

- II. All the taxes levied on commercial vessels belong to the treasury of the deputation of the Imperial Exchange Commission, in order to pay for the lights and all the necessary expenses, repairs, and renovations of lighthouses, according to the enclosed Order, 471, of the 15th January, 1854, marked A. B. C.

During the year 1858, these taxes amounted to 72,732d. 62kr.; the expenses to 69,876d. 05kr.

The costs of buoys and beacons are paid for out of the Imperial Treasury after the receipt of an annual estimate, submitted under the superintendance of the Admiralty, and after having been approved of by the Imperial Board of Trade. These expenses, for which commercial vessels pay no charge whatsoever, amounted during 1858 to,

Buoys and piles	-	3549d. 37kr.
Beacons	-	4288 „ 37 „
Altogether	-	7837d. 74kr.

- III. The enclosed list gives information respecting the lighthouses which have already been erected at the Austrian coasts, and therein are likewise pointed out the positions of seven new lighthouses, which are to be completed within five years.

IV. In selecting positions for lighthouses the Imperial Government is guided by the principle to facilitate as much as possible the navigation near the coasts of Austria washed by the Adriatic Sea; consequently the most suitable positions are chosen by a Commission consisting of shipowners, naval gentlemen, and the Imperial navy, who, combined, are best able to point out the condition of the coast, but particularly also, where possible, the entrance into the harbours, and the positions of dangerously situated rocks or shallows.

V. In the list (3) is given the classification of lights.

VI. The number of assistants employed at the lighthouse of Trieste is four, and they have to signalize during day time always the amount of sails and steamers in sight; at Salvoire are two; and at all the others three are appointed.

The harbour light at the point of the Mole of Fiume is attended to by the authorities of the place, together with the lighting of the town. The assistants usually get 30fls. per month, with oil, fuel, and water for their own use.

VII. The selection of particular classes of lights in use at certain places takes place according to the rules laid down in No. 4; thus there is placed, for instance, at Lagosta a first class light, in order to enable the ships to avoid in proper time the last little rock of

- Agostini, which is very small, dangerous, and above 9 sea miles distant, while a light of the third class is quite sufficient for Trieste.
- VIII. The light apparatus in use are,—
1. *Triest*.—Lenticular catoptric revolving apparatus à la Fresnel, 3rd order, the fire white, flashing.
 2. *Salvo*.—21 argand lamps with large reflectors, the fire white, fixed.
 3. *Rovigno*.—Catoptric lenticular revolving apparatus à la Fresnel, 4th order, large model, the fire white; every two minutes through 8" red flashing.
 4. *Porer*.—18 argand lamps with large reflectors, the fire white, fixed.
 5. *Punte Bianca*.—Catoptric lenticular revolving apparatus à la Fresnel, 3rd order; fire white, fixed and flashing.
 6. *Lagosta*.—Lenticular apparatus of the 1st order, with mixed optical arrangement, viz., the principal part or the centre catoptric, the upper and lower parts, however, dioptric.* The fire white, fixed.
 7. *Punta d'Ostro*.—16 argand lamps with large reflectors; the fire white, fixed.
 8. *Sacca di Pieve*.—20 argand lamps with large parabolical reflectors; fire white, fixed.
 - 9 and 10. *Malamocco*.—Two lighthouses with lenticular catoptric apparatus of the 4th order, small model. Both fires are white and fixed. The Fiume harbour light is quite simple, fixed red, and is lighted with gas like the town lamps.
- IX. As just recorded there are at present in use only the two colours, white and red.
- X. At the lighthouse near Rovigno the red flashing ray is used because it is situated between and not far from the two lighthouses of Salvo and Porer, both of which have white fixed fire; and at Rovigno are quartered also the Austrian coast pilots.
- XI. The various apparatus were mentioned in 8. The catoptric apparatus à la Fresnel were taken as the best, since they consume the smallest quantity of fuel and furnish at the same time the finest light, on which account they are introduced gradually everywhere.
- XII. Mr. Henry Lepaute at Paris is the maker of the most approved catoptric apparatus à la Fresnel, and the drawings may be had from him.
- XIII. Here is the Table according to the question.
- XIV. The selection of the different optical apparatus is arranged according to the principle expressed in 10.
- XV. The circumstances of the locality are taken into consideration respecting the utmost height of the lighthouses, with especial calculation for the fog caused by the easterly winds, on which account the height of the same at the eastern coast of the Adriatic ought not to be above 400 feet.
- XVI. The most approved kind of ventilation seems to be that of the lighthouse of Lagosta, which consists of eight openings, supplied with bronze covers, and which may be closed and opened at pleasure.
- These openings of ventilation are marked *a* in the enclosed design of such a lighthouse, No. 1.
- XVII. They burn usually fine olive oil. But for the lights à la Fresnel, they use the olive oil named *for di pila*, which is imported from Istria and Dalmatia, because it is not so fat.
- XVIII. No other kind of proceedings is applied for the production of the light but olive oil.
- XIX. The lighthouses are erected according to circumstances partly by private agreements, partly by means of public tender, and partly by the Commission of the Exchange themselves, and private contracts seem to be the most economical, and in most cases also to have answered best.
- The light apparatus à la Fresnel, are ordered from Mr. Henry Lepaute in Paris.
- The argand lamps, together with the reflectors and what else belongs to the same, are made by M. Giovanni Rosario, at Milan.
- The Commission of the Exchange attend to the paint and other stores as they think best.
- The buoys and beacons are, according to the contract, in the Stabilimento tecnico Triestino. The anchors and chains which may be necessary are ordered from the works of Mr. H. Wood, in Liverpool.
- The piles are fitted and kept in repair by a contract for five years by means of public sale.
- XX. An employé of the Commission of Exchange pays every year an official visit to all the lighthouses, in order to convince himself of the perfectly good keeping of the same, as well as of the light apparatus and of the whole furniture, and in order to propose necessary repairs, alterations, &c. At every lighthouse is kept a list of all articles there, which must be strictly correct at all times.
- XXI. The lighthouses are usually once in two years whitewashed inside with lime.
- The chamber of the light apparatus is painted white with oil paint, and the cupola green with oil paint.
- The buoys and beacons are coated once in six months with red oil paint (minium), which, after repeated trials, seems to answer best as a means to preserve iron, or sheets of iron, placed in the water.
- The piles are painted every year once from the level of the water upwards with tar.
- XXII. Hitherto all lighthouses have been painted in one way, but they will be painted in future most likely white and red, or somewhat similarly, in order to enable the navigators to distinguish one from the other, easily from the distance.
- XXIII. Every renovation or alteration of a light apparatus is to be first submitted for approval on the part of the Admiralty by the Commission of the Exchange; and every new introduction is to be examined previously by a Commission.
- As to the buoys, beacons, and piles, the proposals for all needful increase, alterations, or improvements, repairs, &c., are to be made by the employés of the Admiralty.
- XXIV. Every lighthouse is supplied with a thermometer and a telescope, respecting which the keepers have no printed rules.
- XXV. Since the difference between tide and flood is small in the harbours of the Adriatic, amounting to from three to four feet at the utmost, the height of the water is nowhere reported.
- The local circumstances of the harbour of Malamocco, where the current is very considerable, as well during the tide as during the flood, demand particular care on entering, especially if the wind is strong and contrary; and therefore the pilots stationed there announce to ships which are about to enter, the most useful signals by means of three flags,—a red, a blue, or a white one.
- The red flag hoisted on the pilot ship designates:—
You are not able to enter; retire.
 The blue one:—
Presently you will be able to enter, till then withdraw, and remain in sight.
 The white one:—
You may enter; we start to meet you.
- At night time the red flag is replaced by two Bengal lights, the blue one by one Bengal light, and the white flag by means of a lantern, which is drawn up and down frequently.
- XXVI. At the extreme point of the large northern dam of the harbour of Malamocco is situated an iron scaffolding of the height of 42 feet, which is supplied with a kind of clockwork, which is wound up when a fog happens to arise, and which signalizes to ships, by means of strokes upon a gong, the entrance into the harbour.
- XXVII. Enclosed are three drawings of the Lighthouse of Lagosta, and one of that at Porer; both of these lighthouses are built of stone; the former appears to have the preference.
- The Commission of the Exchange not being in possession of the necessary data, the information required thereon cannot be supplied.
- XXVIII. The enclosed design represents buoys, beacons, and also one of the piles which are in use.
- XXIX. The up-buoysing at harbours, canals, banks, &c., is conducted according to local circumstances and requirements.
- XXX. Only those piles of oak stems pointed out in 28 are peculiar.
- XXXI. The Commission of the Exchange compose for each lighthouse separate rules for the keeper, which depend on local circumstances. Printed rules were never promulgated.

* It is evident that throughout this return the words "catoptric" and "dioptric" are reversed.

LOCAL RETURN.

NORTHFLEET.

NORTHFLEET LIGHTHOUSE.

LIGHTHOUSE.—(SPECIAL RETURN.)

- I. Northfleet, Kent.
 II. The Conservators of the River Thames.
 III. The Conservators of the River Thames.
 IV. One light only.
 V. None.
 VI. None.
 VII. 3rd September, 1859.
 IX. It was built by contract by Messrs. W. Simpson and Co., of Grosvenor Road, Pimlico. The engineer was Stephen Wm. Leach, the engineer to the Conservators of the River Thames.
 X. Harbour light.
 XI. Wrought iron. It is constructed in open skeleton work, excepting strips of iron arranged so as to show in the line of sight two lozenge-shaped pieces of closed work, the lower 16 feet, the upper 8 feet in height.
 XII. There is no lightning conductor.
 XIII. Fifty feet.
 XIV. Fifty-three feet.
 XV. It is intercepted by a bend of of the river.
 XVI. See last answer.
 XVIII. Fixed; white and red. White to the northward of mid-channel in Gravesend Reach, which is the portion of the river for ships to navigate in; and red to the southward of mid-channel, which is the portion of the river for ships to anchor in.
 XX. Sunset to sunrise.
 XXI. Dioptric.
 XXII. Fourth order.
 XXIII. No alteration has been made.
 XXIV. Messrs. W. Wilkins and Co.
 XXV. Through the ball surmounting the lantern.
 XXVI. There are none.
 XXVII. See last answer.
 XXVIII. No register is kept.

	£	s.	d.
XXIX. Cost of construction	-	387	0 6
Cost of site and conveyance of deeds	138	12	0

	ft.	in.
XXXI. Diameter of lantern (inside measure)	-	4 6
Height in glass	-	3 3
Height of ball from top of glass	-	4 0
Height from floor of lantern room to bottom of glass	-	3 3
Cost of lantern, dioptric apparatus, and fitting		235l. 2s. 2d.

- XXXII. See answer to Question XXIX.
 XXXIII. Nil. No repairs are likely to be required.
 XXXIV. It has been once painted at a cost of 10l. 6s. 9d. This will last probably two or three years.
 XXXV. £2 per annum for cleaning.
 XXXVI. Included in amount given in answer to Question XXXI.
 XXXVII. Cost for one year 3l. 4s. 6d.
 XXXVIII. It is lighted with gas.
 XXXIX. See last answer.
 XL. The net cost for one year was 12l. 11s. 2d.
 XLI. There is no such apparatus.
 XLII. The Conservancy Fund.
 XLIII. to XLVII. These questions do not apply.
 XLVIII. None have been made.
 XLIX. None have been made.
 L. It was not then built.
 LI. LII. See answer to Question L.
 LIII. Glass chimnies only are required, and the supply is renewed when the number is reduced to six.
 LIV. None used.
 LVI. None used; nor are any required.
 LVII. There are no keepers.
 LVIII. None.

TABLE OF PRICE.

DIOPTRIC. 4th Order.	{	Price	-	232l. 2s. 2d.
		Ordinary repairs	-	3l. 4s. 6d.
		Gas - Cost	-	12l. 11s. 2d.

BUOYS AND BEACONS.

- I. Conservators of the River Thames.
 X. No. 1 Beacon at the India Arms Wharf, Northfleet, which is described on a separate form; No. 2 Beacon at West Thurrock, in Essex.
 b. July 1859.
 c. To enable vessels to clear Black Shelf, off Grays. It consists of a pole surmounted by a circular disc, and stands near West Thurrock Church on the foreshore of the river, near the edge of the saltings.
 e. Wood.
 f. Red.
 g. It is not lighted.
 h. Thirty feet.
 i. £11 18s. 5d.
 j. See answer X. b.

MARINERS' EVIDENCE, No. 579. Page 579.

SIR, Buchan Ness, 29th September, 1859.
I HAVE received your letter of the 23rd inst., with your views on the subject of the more definite marking of the Outer Dowsing Shoal.

It shall be appended to the answers you have already furnished us with relative to the general lighting and buoying of our coasts, and for which, as I have before stated, we are much obliged to you.

I remain, &c.
(Signed) W. A. B. HAMILTON,
Rear Admiral.

Chairman of the Royal Commission on Lighthouses.
Mr. Peter D. Dodds,
Sunderland.

39, Wear Street, Sunderland,
23rd September, 1859.
SIR, I SHOULD not have troubled you with any further remarks about lights, buoys, &c., had I not heard so much grombling about the Outer Dowsing Shoal being so much neglected. Now Sir, I do not like to hear this, for of all nations in the world, I do not know of one that pays greater attention to lights, buoys, and beacons, and making the way clear than does ours.

Knowing that two or three persons here have taken each a copy of your questions to answer, and to call your attention to that shoal in particular, I thought it my duty to give my opinion.

You will observe in my remarks on a former occasion that I never noticed it, for this reason, that in consequence of its close proximity with the Dudgeon, I thought it would be better without a light, because it would only cause confusion (for I do think that there is as much danger in having too many lights as there is in having too few), more especially to those vessels coming from the Baltic. Of course we must look at both sides of the question, or rather the interests of all parties concerned.

I am aware that there are times, especially in the winter season, and east winds prevailing, when a lightship near that shoal would be serviceable to a certain class of ships; I mean those that load here for India and the Red Sea, which are of a great draught of water, and are generally provided with a pilot who, with an east wind, generally shapes a course to go between the Dudgeon and Outer Dowsing. There are also times when they may be plying to windward against strong SSE. winds, apt to stretch off outside the latter shoal in hopes of the wind veering a point or two to the eastward, and enabling them to weather it. Coasters, however, who are well acquainted, invariably steer for the former, and when they make it, go either to windward or to leeward, as circumstances suit them. With regard then to those who prefer going between the two: I admit that a light near the Dowsing would be of service. But then, how would it answer for the Baltic men, which are as numerous as the coasters, and I would ask those advocates for the Dowsing Light, what sort of one would they propose. It surely would not be a single light, because it might be mistaken for the Dudgeon. It would not do

to have two sights, because it might be mistaken for Hasbro' Sand. It would not answer to revolve, because it might be mistaken for the Leman and Ower, or Cromer. Neither would it do to have three lights, because it might be mistaken for the Newarp. To make such a mistake may appear to some men paradoxical, more especially to those navigators who are accustomed to have good timekeepers on board, and who would consider it bad navigation to be one mile out of their reckoning in a distance of 300 miles. But I assure you that when I came passenger on board a fine Danish barque four years ago last March, after a good run of four days, when they were looking out for the Leman and Ower, they made Winterton and Hasbro' Lights. When I got on deck the master declared he could not imagine what lights they could be. We were then running under snug canvas, blowing hard, wind about east. We soon made all the other lights, which only increased his confusion, for he was completely bamboozled. He begged of me to take charge of the ship and pilot her to the Downs. I did so for my own sake, and on the following day I landed at Ramsgate.

I state these facts merely to prove that it is possible to have too many lights in the vicinity of dangers, and which I think would be the case were there one placed near the Outer Dowsing.

With regard to the buoys on that shoal, I really do not know whether there is more than one, if not, two are indispensable, one on the north end, black with staff and ball, and one on the south end, white, both to be nun buoys.

I beg further to remark, that all the years I have been trading in these waters, I never but once fell in with that shoal, I knew my position, and of course was on the lookout. I can also assert that I do not recollect of a ship being lost upon it. We have had many missing ships, which have been supposed to be lost on it, but I think it is the height of presumption for any man to affirm, or imagine even, that they have suffered by one particular peril when they are exposed to so many, especially when not a vestige of the ill-fated vessels were ever seen.

In my former remarks relating to tide-signals, I forgot to state the loss of two foreign Indiamen, the first a Dutch ship in the winter of 1857; the other a Bremen ship in the following winter. The wind was moderate, and the sea strong from north-east on both occasions, but not so strong as to prevent them hauling off to sea had they foreseen the danger (too little water). The consequence was, they came to the ground on the bar, broke their tow-ropes, and drove ashore behind the North Pier, and were wrecked (see "Shipping and Mercantile Gazette"). Had their been tide signals established on either pier to denote the depth of water on the bar, both these fine vessels would have been saved.

Sir, you will perhaps be so good as to append these remarks to the others corresponding to their respective questions and answers.

I have, &c.,
(Signed) PETER D. DODD.

W. A. B. Hamilton
Rear Admiral.

LONDON:
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Printers to the Queen's most Excellent Majesty.
For Her Majesty's Stationery Office.

December 12 1861

List of the records of the Light Horse
Commission taken by the Chairman
Admiral Hamiliton.

Correspondence . -

33 Volumes bound, according to
the files. The whole numbered
and arranged,

1 Register of Correspondence by
which any paper can be found.

1. Index.

1 Minute book containing the
manuscript of part of the
appendix. -

1. address book. - ^{No 2.}
Files. 15. 12. 19. 31. unbound. 1 (receiving file)
accounts kept by Secy.

11-9 Maps. Gen. General.

1. large Portfolio to accompany the
returns from Foreign Countries
(see appendix) marked
Drawings maps Netherlands
Vienna. Belgium Denmark
Spain.

✓ 3 ditto. America.

✓ 1. do. England.

✓ 1. do. from local authorities
in England. The British Isles with
Index Map.

✓ 1. do. drawings maps. Scotland

1 do. France



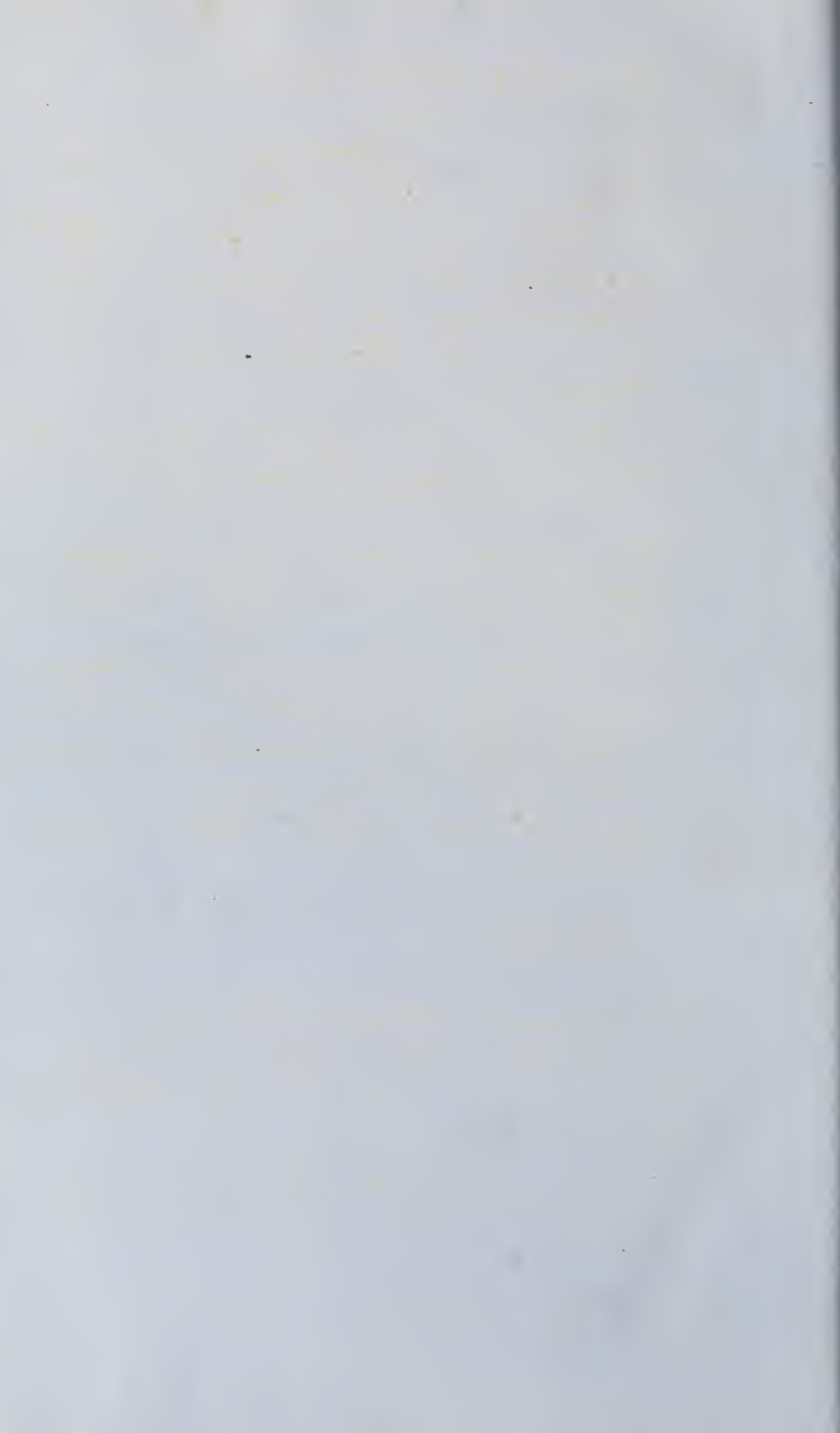
- 1. do. maps. Charts of the coast of Ireland 1859.
- 1. do. Ireland. Drawings.
- 1. do. France. -

all these are arranged with reference to the report and appendices. So that any paper referred to therein can be found. -

- 1. Blue book office copy of the report and appendix.
- 1 a miscellaneous list of maps charts and drawings rolled together.
- 2. maps of Liverpool Bay in cases.
 - 1. date. of Ireland. - in case
 - 1. date. light-house map in case
 - 1. date. on spring roller.
 - 3 light house maps 2 mounted on rollers. -

Books.

- 4. Spanish reports bound. - all the books referred to in the Foreign reports. see appendix American, French, &c
- 6 Volumes bound Inverious reports on light-houses. 1822. 1854. 1855.
 - 1. Post office directory.
 - 1. Clergy list.
 - 2. British & Foreign light lists bound



1. British list of lights. Volume
1. American report on Fisheries.
2. Neutral's Almanacks.
1. French dictionary
1. — Burns date.
1. Fundamental treaty on Light Houses
1. Land list.
2. Imperial Calendars.
1. Standing orders.
1. Court guide.
1. Johnson's dictionary
1. Mercantile Marine Navy list
1. Highhouse Munimenta. Stevensen
1. Murray's Travel book France
- 15 books of sailing directions.
1. Report on Harbours & Refuge.
1. Scuttler's Juice list.
1. Table of Light-dues.

A great lot of miscellaneous papers printed and manuscript, chiefly proofs and revises of the report and appendices as they passed through the press. —

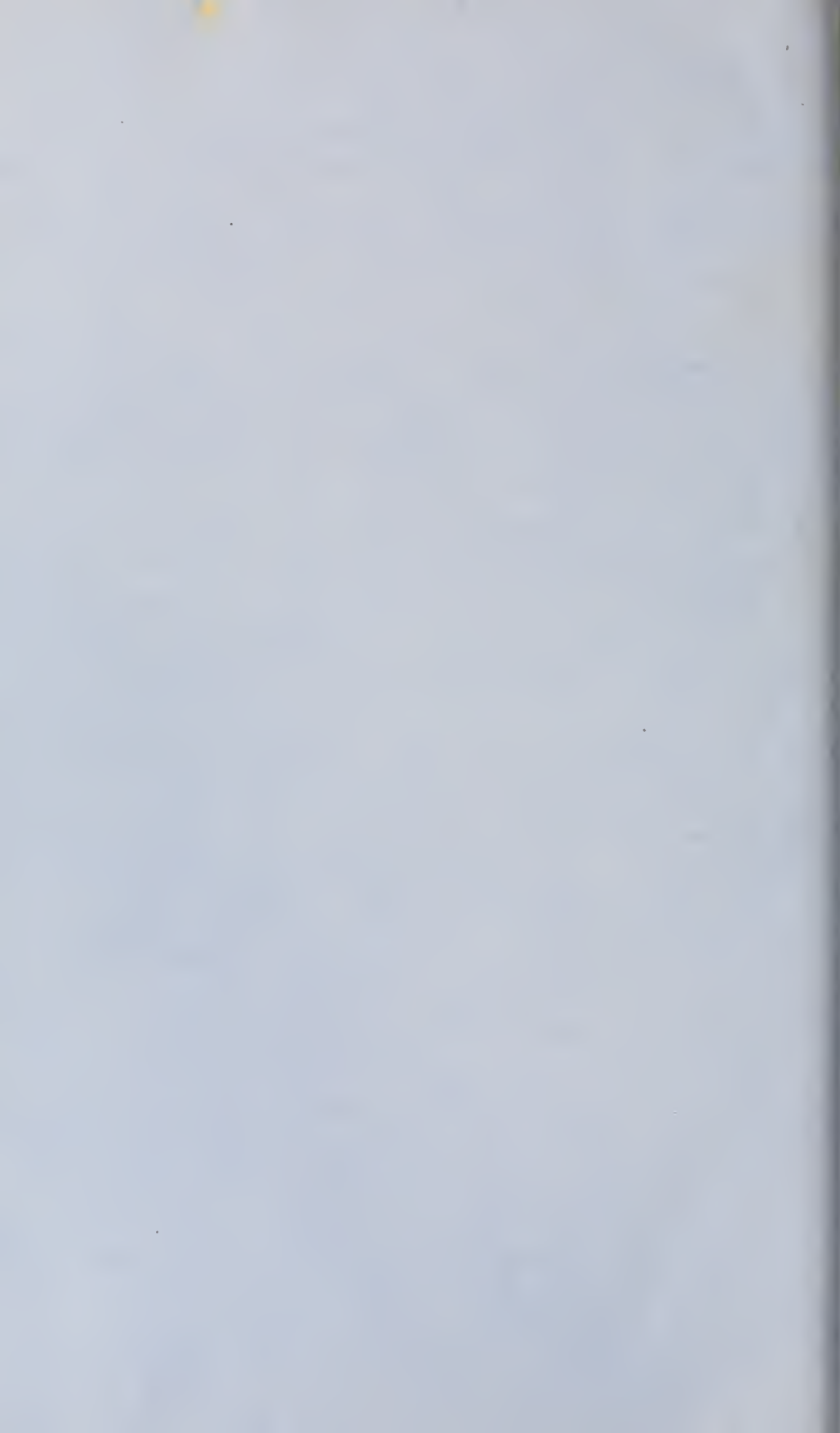
but some returns from the Trinity House which it was not thought advisable to print are in this lot. —

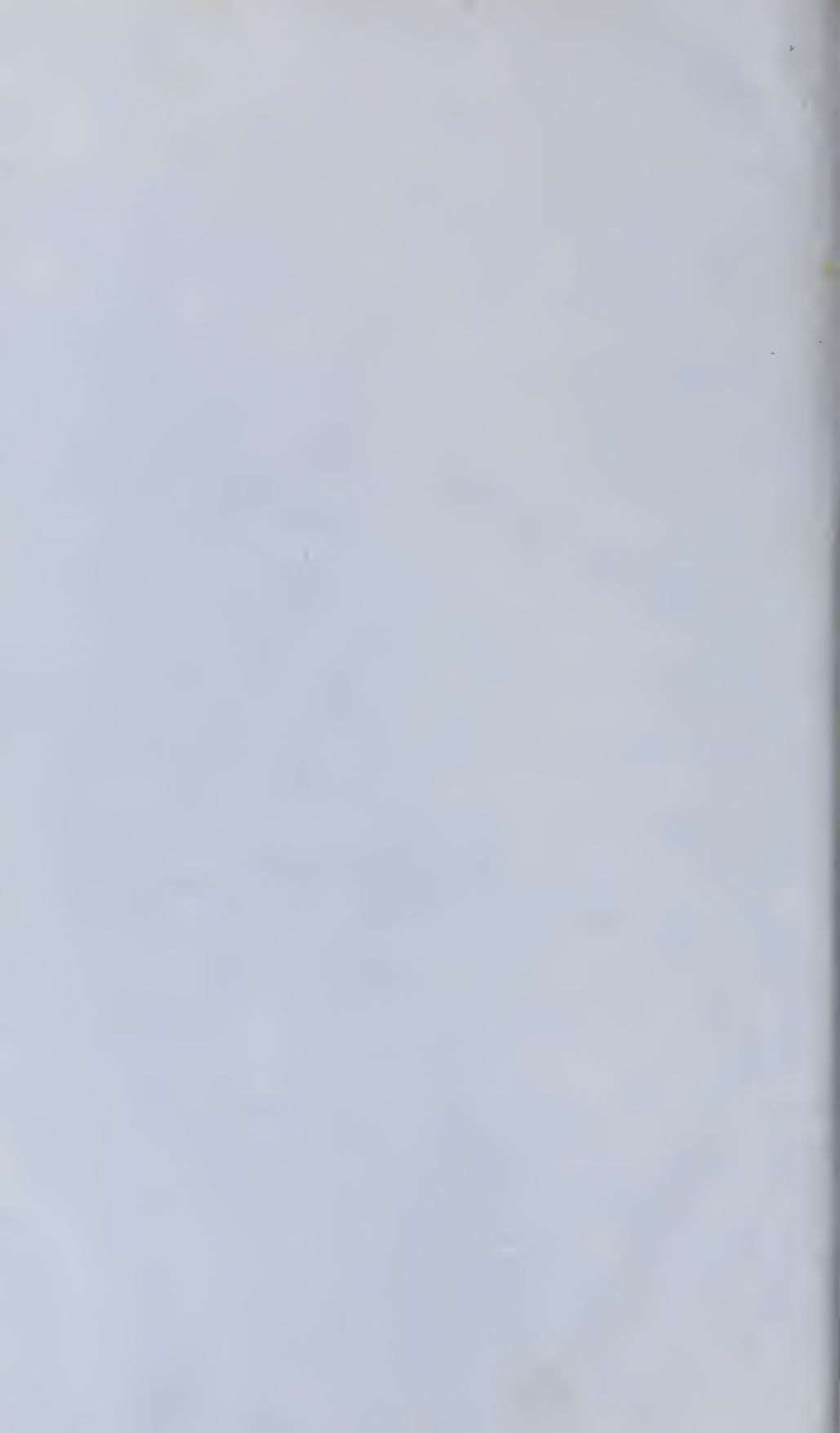
The bound volumes contain all that was thought worthy preserving. —

The maps and drawings are most likely to be of value.

W. B. Hamilton







UNIFORM CODE

FOR THE

DISTINCTION OF BUOYS BY COLOUR

BY E. J. B.

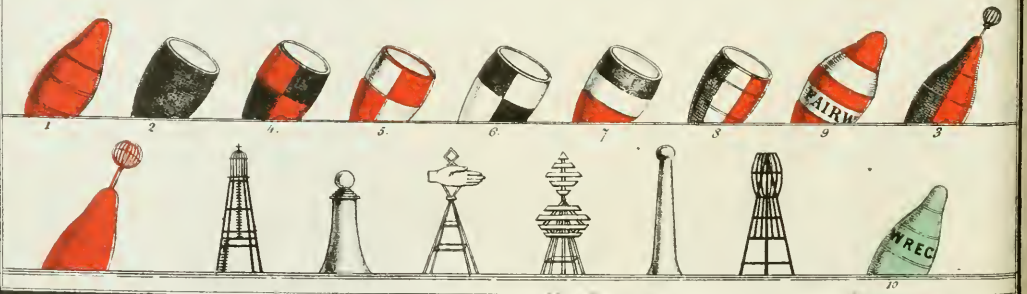
CODE OF UNIFORMITY IN THE COLOUR OF BUOYS.

PROPOSED FOR THE ADOPTION OF ALL NATIONS.

BY

CAPTAIN E. J. BEDFORD, R.N.

SKETCH IN ILLUSTRATION OF SYSTEM.



PROPOSED UNIFORM CODE

For Buoying Dangers of every description, explained and illustrated in accordance with the Principle first suggested in 1854 to the Commissioners of Northern Lighthouses in Scotland, and since then urged for General Adoption by Captain E. J. Bedford, R.N.

Explanation of the Principle.

ALL the General Outer Fairway of the Navigation is proposed to be buoyed as to, and from, a District Centre; but all Harbours, Lochs, and Estuaries, as to, and from, the principal Port therein, such as to Stranraer, in Loch Ryan, thus:—

EXAMPLE OF THE CENTRES PROPOSED.

- ENGLAND, IN THREE DIVISIONS. { West, . . . { 1st. The Mersey, between the Mull of Galloway and St David's Head.
 { South and East, . . . { 2d, The Severn, between St David's Head and the Land's End.
 The Thames, between the Land's End and St Abb's Head.
- SCOTLAND, IN TWO DIVISIONS. { West, The Firth of Clyde, between Cape Wrath and the Mull of Galloway.
 { East, The Firth of Forth, between Cape Wrath and St Abb's Head.
- IRELAND, IN TWO DIVISIONS. { West, Galway Bay, }
 { East, Dublin Bay, } Rathlin Island and Cape Clear.

No.	Distinctive Colour of Buoy.	Purpose to be served.	Sailing Directions from Seaward.	REMARKS.
1.	Red	Bounding Main Channel	Keep on Starboard hand.	By Main Channel is meant, that between dangers connected with the Shore, or that which may only be considered necessary to Buoy. Red Nuns in lieu of Can Buoys, as more conspicuous, to allow for the effect of Fogs.*
2.	Black	Bounding Main Channel	Keep on Port hand.	
3.	Black and Red, Vertical .	Bounding Lower End of connected Dangers, also division between Channels	Pass on either hand in the direction of the Channel.	Buoy's are placed Seaward of the danger.
4.	Black and Red, Chequered	Marking Small Central Dangers	Pass on either hand as 3.	
5.	Red and White (various)	Bounding Port Side of Large Central Dangers	Keep on Starboard hand.	
6.	Black and White (various)	Bounding Starboard Side of Large Central Dangers	Keep on Port hand.	
7.	Black, White, and Red, Horizontal	Bounding Upper End of Large Central Dangers	Pass on either hand as 3.	
8.	Black, White, and Red, Vertical	Bounding Lower End of Large Central Dangers	Pass on either hand as 3.	
9.	In Belts of Colour, with the word "Fairway" on it	Fairways	Pass on either hand.	1. Black and White—Port Fairway. 2. Black and Red—Centre Fairway. 3. Red and White—Starboard Fairway.
10.	Green, with the word "Wreck" on it	Sunken Wreck	Pass on either hand.	Dark Green Buoys might be substituted for Black ones, and would then better assimilate with Green Lights.†
11.	Beacons and Perches . . .	On Low Water Points, and Central Dangers	Pass according to Colour.	

NOTES.—Buoys can be further distinguished by the Name or Initials of the Channel or Danger, and Number, commencing from Seaward.

Beacons are either of Stone, Iron, or Wood, and when in lieu of Buoys, are subject to the same Rules. Perches are Masts with Balls, or other Devices.

This arrangement is founded upon the plan introduced by the present Rear-Admiral Denham for Buoying the Port of Liverpool in 1833. Its primary characteristics have been adopted by the Commissioners of Northern Lighthouses in Scotland since 1857, and over several localities of the British Coast, also along the shores of the United States since 1851, and other Continental Seabords.

It would be desirable to note the District Centres in the Sailing Directions, and the General Charts of the Coast referred to.

* Title Code of Fog Signals, and of Buoy and Tide Signals, by ALEXANDER CUNNINGHAM, F.R.S.S.A.
 † Suggested by Captain G. A. BEDFORD, R.N.

