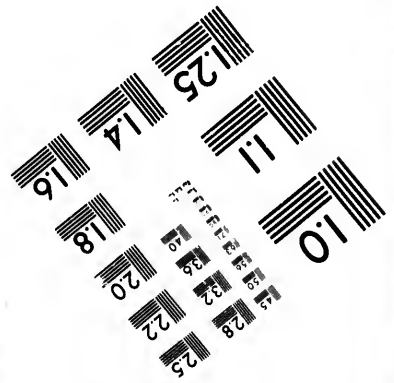
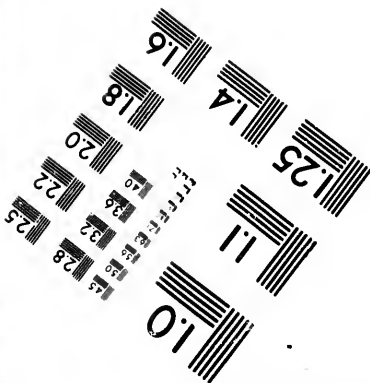
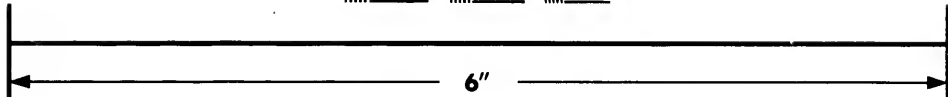
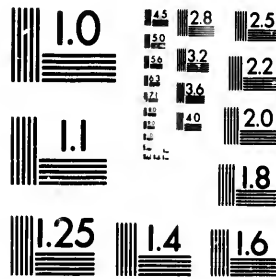


**IMAGE EVALUATION  
TEST TARGET (MT-3)**



**Photographic  
Sciences  
Corporation**

23 WEST MAIN STREET  
WEBSTER, N.Y. 14580  
(716) 872-4503



**CIHM/ICMH  
Microfiche  
Series.**

**CIHM/ICMH  
Collection de  
microfiches.**



Canadian Institute for Historical Microreproductions / Institut canadien de microreproductions historiques



**© 1985**

Technical and Bibliographic Notes/Notes techniques et bibliographiques

The Institute has attempted to obtain the best original copy available for filming. Features of this copy which may be bibliographically unique, which may alter any of the images in the reproduction, or which may significantly change the usual method of filming, are checked below.

L'Institut a microfilmé le meilleur exemplaire qu'il lui a été possible de se procurer. Les détails de cet exemplaire qui sont peut-être uniques du point de vue bibliographique, qui peuvent modifier une image reproduite, ou qui peuvent exiger une modification dans la méthode normale de filmage sont indiqués ci-dessous.

- Coloured covers/  
Couverture de couleur
- Covers damaged/  
Couverture endommagée
- Covers restored and/or laminated/  
Couverture restaurée et/ou pelliculée
- Cover title missing/  
Le titre de couverture manque
- Coloured maps/  
Cartes géographiques en couleur
- Coloured ink (i.e. other than blue or black)/  
Encre de couleur (i.e. autre que bleue ou noire)
- Coloured plates and/or illustrations/  
Planches et/ou illustrations en couleur
- Bound with other material/  
Relié avec d'autres documents
- Tight binding may cause shadows or distortion along interior margin/  
La reliure serrée peut causer de l'ombre ou de la distorsion le long de la marge intérieure
- Blank leaves added during restoration may appear within the text. Whenever possible, these have been omitted from filming/  
Il se peut que certaines pages blanches ajoutées lors d'une restauration apparaissent dans le texte, mais, lorsque cela était possible, ces pages n'ont pas été filmées.
- Additional comments:/  
Commentaires supplémentaires:
- Coloured pages/  
Pages de couleur
- Pages damaged/  
Pages endommagées
- Pages restored and/or laminated/  
Pages restaurées et/ou pelliculées
- Pages discoloured, stained or foxed/  
Pages décolorées, tachetées ou piquées
- Pages detached/  
Pages détachées
- Showthrough/  
Transparence
- Quality of print varies/  
Qualité inégale de l'impression
- Includes supplementary material/  
Comprend du matériel supplémentaire
- Only edition available/  
Seule édition disponible
- Pages wholly or partially obscured by errata slips, tissues, etc., have been refilmed to ensure the best possible image/  
Les pages totalement ou partiellement obscurcies par un feuillet d'errata, une pelure, etc., ont été filmées à nouveau de façon à obtenir la meilleure image possible.

This item is filmed at the reduction ratio checked below/  
Ce document est filmé au taux de réduction indiqué ci-dessous.

10X	14X	18X	22X	26X	30X
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12X	16X	20X	24X	28X	32X

The copy filmed here has been reproduced thanks to the generosity of:

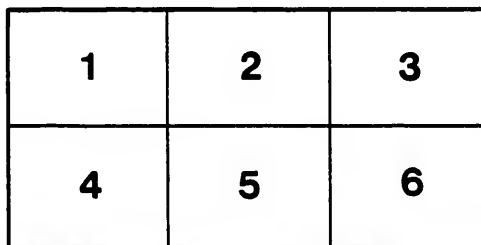
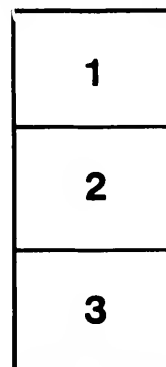
Seminary of Quebec  
Library

The images appearing here are the best quality possible considering the condition and legibility of the original copy and in keeping with the filming contract specifications.

Original copies in printed paper covers are filmed beginning with the front cover and ending on the last page with a printed or illustrated impression, or the back cover when appropriate. All other original copies are filmed beginning on the first page with a printed or illustrated impression, and ending on the last page with a printed or illustrated impression.

The last recorded frame on each microfiche shall contain the symbol  $\rightarrow$  (meaning "CONTINUED"), or the symbol  $\nabla$  (meaning "END"), whichever applies.

Maps, plates, charts, etc., may be filmed at different reduction ratios. Those too large to be entirely included in one exposure are filmed beginning in the upper left hand corner, left to right and top to bottom, as many frames as required. The following diagrams illustrate the method:



L'exemplaire filmé fut reproduit grâce à la générosité de:

Séminaire de Québec  
Bibliothèque

Les images suivantes ont été reproduites avec le plus grand soin, compte tenu de la condition et de la netteté de l'exemplaire filmé, et en conformité avec les conditions du contrat de filmage.

Les exemplaires originaux dont la couverture en papier est imprimée sont filmés en commençant par le premier plat et en terminant soit par la dernière page qui comporte une empreinte d'impression ou d'illustration, soit par le second plat, selon le cas. Tous les autres exemplaires originaux sont filmés en commençant par la première page qui comporte une empreinte d'impression ou d'illustration et en terminant par la dernière page qui comporte une telle empreinte.

Un des symboles suivants apparaîtra sur la dernière image de chaque microfiche, selon le cas: le symbole  $\rightarrow$  signifie "A SUIVRE", le symbole  $\nabla$  signifie "FIN".

Les cartes, planches, tableaux, etc., peuvent être filmés à des taux de réduction différents. Lorsque le document est trop grand pour être reproduit en un seul cliché, il est filmé à partir de l'angle supérieur gauche, de gauche à droite, et de haut en bas, en prenant le nombre d'images nécessaire. Les diagrammes suivants illustrent la méthode.

re  
détails  
es du  
modifier  
er une  
filmage

es

errata  
l to

é pelure.  
on à



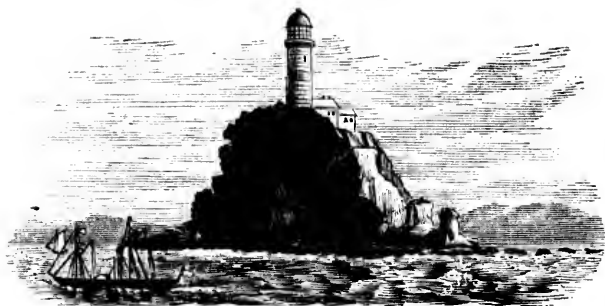
The pecked lines show the progress of the Tide Wave hour by hour. — The figures must not be understood as showing the local time of High Water.

18

I

184

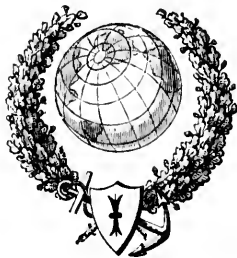
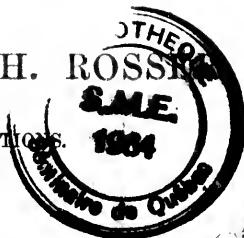
THE  
LIGHTS AND TIDES  
OF THE  
WORLD.



BY

J. F. IMRAY, F.R.G.S., AND W. H. ROSS

WITH A CHART AND NUMEROUS ILLUSTRATIONS.



LONDON, E. :  
JAMES IMRAY & SON,  
CHART PUBLISHERS AND NAUTICAL BOOKSELLERS.  
MINORIES AND TOWER HILL.  
1866.

# TIDAL CHART OF THE



The pecked lines show the progress of the Tide Wave hour by hour. The figures must not be understood as showing the local time of High Water.

LONDON, JAMES IMRAY AND SO.

# CHART OF THE WORLD

To face Title





*In this Work the Bearings are Magnetic, and the Distances are in Nautical Miles.*

---

(N.B.—Appendices to this work will be published as occasion requires, and may be had of the Publishers or their Agents.)

A work  
time as comp  
when *making*

Part 1  
the end of  
Change of th  
the ten colum

Col. 1.  
„ 2.

„ 3.  
„ 4.  
„ 5.  
„ 6.  
„ 7.

„ 8.

Part II  
Full and Ch  
Both I  
“Lights” a  
by the Fren  
For ea  
Introd  
Illuminatio  
*Finding the*  
Introd  
Wave; an  
given day a  
The I  
when appre  
especially v

*April,*

## P R E F A C E .

A work on the "Lights and Tides of the World" ought to be one of easy and ready reference, and at the same time as comprehensive as possible, so as to embrace the requisite knowledge on those subjects required by a seaman when *making or sailing along a coast*; hence the present division into Two Parts.

Part I. contains a tabular list, in geographical order, of the Lights established in every region of the globe to the end of March, 1866; giving their position, character and range, as well as the times of High Water at Full and Change of the Moon *at the ports* contiguous to the position of the Lighthouses; the remarks at the head of each of the ten columns give ample information as to the nature of the contents, thus:—

- Col. 1. Gives the Name of the Lighthouse or Light-vessel (L.V.)  
,, 2. Gives the No. of Lights (1, 2, or 3); indicating whether \**Fixed* (F.), *Flashing* (Fl.), *Fixed and Flashing* (F. and Fl.), *Revolving* (Rev.), *Intermittent* (Int.), or *Alternating* (Alt.); the color of the light may be *white, red, green or blue*; if white, no color is expressed. The period of revolution or eclipse is expressed in minutes and seconds, as 20 s., 1 m. 45 s., &c.  
,, 3. Gives the Distance, *in Nautical Miles*, that the Light can be seen in clear weather.  
,, 4. Gives the Height of the Light above the Sea.  
,, 5. Indicates on what Headland, Island, or part of the Port, Harbour, or Roadstead the Light is placed.  
,, 6. Gives the Latitude and Longitude of the Lighthouse.  
,, 7. Contains *remarks* of various kinds, as the relative bearings of the lighthouses when there are two or more; the direction in which the Lights can be seen, &c. *The Bearings are Magnetic. Bell, or Gong*, shows that one or the other is sounded in foggy weather. *Bull, or Globe*, indicates that one or the other is hoisted at the mast-head of the Light-vessel during the day.  
,, 8. Gives the Time of High Water at Full and Change of the Moon at the Ports and Harbours in the vicinity of the Lights, and Col. 9 gives the Rise of Water at Spring Tide.

Part II. contains a tabular list, in alphabetical order, of the "Establishment of the Port," or the Tidal-Hours at Full and Change of the Moon at all places on the globe where those hours have been determined.

Both Parts have been carefully collated and compared with all the recognized Authorities on the subject of "Lights" and "Tides," such as the British Admiralty Publications, the Trinity House Notices, and the Works issued by the French, Spanish, Dutch, Russian, and United States Hydrographic Offices.

For each part of the work a special introduction has been written.

Introduction I., which is copiously illustrated, gives a brief sketch of the History of Lighthouses and of Lighthouse Illumination, including also the subject of Beacons and Buoys; appended to this introduction are two useful *Tables for Finding the Distance of a Vessel from a Lighthouse*.

Introduction II. contains a few brief remarks on Tides, illustrated by a Chart showing the progress of the Tide Wave; and by means of the Tables here given, and the Tide-Hour at F. and C., the Time of High Water for any given day at any given place can be readily found.

The Lights and Tides have been advisedly united in one work as essentially useful to the Mariner,—for example, when approaching a coast and making a light it is equally necessary to recognise the light and to know the *state* of tide, especially where the tidal current is strong, for on that knowledge the very safety of the vessel may depend.

April, 1866.

J. F. I. AND W. H. R.

\* N.B.—The Alphabetical Index (p. 137—149) gives the color of the Light-towers and Light-vessels.

# CONTENTS.

Introduction to Lights, &c. . . . .	v.
Introduction to Tides . . . . .	xxiv.
Lights, &c., of the British Islands . . . . .	1
"    Belgium . . . . .	21
"    Holland . . . . .	21
"    Hanover . . . . .	25
"    River Elbe . . . . .	25
"    Holstein, Schleswig and Jutland . . . . .	26
"    Kattegat . . . . .	27
"    Little Belt . . . . .	28
"    Great Belt . . . . .	29
"    The Sound . . . . .	30
"    Bornholm . . . . .	31
"    Hanse Towns and Prussia . . . . .	31
"    Russia (Gulf of Finland) . . . . .	32
"    Sweden . . . . .	34
"    Norway . . . . .	36
"    White Sea . . . . .	39
"    France—N.W. Coast . . . . .	40
"    "    W. Coast . . . . .	46
"    Spain—N. and W. Coasts . . . . .	49
"    Portugal . . . . .	51
"    Spain—S. Coast . . . . .	52
"    Mediterranean	
"    Spain . . . . .	54
"    France . . . . .	57
"    Corsica . . . . .	59
"    Sardinia . . . . .	60
"    Italy . . . . .	60
"    Sicily . . . . .	63
"    Malta and East Coast of	
Italy . . . . .	64
"    Adriatic & Ionian Islands . . . . .	65
"    Grecian Archipelago . . . . .	67
"    Dardanelles & Marmora . . . . .	69
"    Bosphorus . . . . .	70

Lights, &c., of Mediterranean—Black Sea . . . . .	70
"    "    Sea of Azov . . . . .	72
"    "    Karamania and Syria . . . . .	73
"    "    N. Coast of Africa . . . . .	74
"    Azores and Canary Islands . . . . .	76
"    Bermuda . . . . .	76
"    Africa—W., S., and E. Coasts . . . . .	77
"    Reunion and Mauritius . . . . .	78
"    Arabia and Red Sea . . . . .	79
"    India—West or Malabar Coast . . . . .	79
"    Ceylon . . . . .	81
"    India—Coromandel Coast . . . . .	81
"    Bay of Bengal (E. Coast) & Malacca Strait . . . . .	82
"    Indian Archipelago . . . . .	83
"    Cochin China and China . . . . .	84
"    Japan and Tartary Gulf . . . . .	85
"    Kamchatka . . . . .	86
"    Australia . . . . .	86
"    Tasmania . . . . .	89
"    New Caledonia . . . . .	90
"    New Zealand . . . . .	90
"    Society Islands . . . . .	91
"    Hawaii Group or Sandwich Islands . . . . .	91
"    British North America . . . . .	92
"    United States . . . . .	99
"    West India Islands . . . . .	120
"    Tierra Firme and Gulf of Mexico . . . . .	123
"    South America . . . . .	124
"    North America—W. Coast . . . . .	127
"    Appendix to April, 1866 . . . . .	129
Longitudes from Greenwich, of well-established	
Meridians . . . . .	132
Blank pages for recent insertions . . . . .	133
Alphabetical Index to Lights, &c. . . . .	137
Beacons and Buoys, Coast of France . . . . .	150
PART II.—Tide-Hours at F. and C. at the principal	
Ports and Harbours in the World . . . . .	1* to 22*

LIG

1.  
Name of  
Light.  
  
Hurst.  
  
Dungeness.  
  
Lowestoft.  
  
Tees Bay.  
  
Buddonness.  
(River Tay

# LIGHTS AND TIDES OF THE WORLD.

## ADDENDA TO JANUARY 1ST., 1867.

SEE ALSO APPENDIX, PAGES 129-131.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.		4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	Page in Book.
		Miles	Feet.			Lat.	Long.		
Hurst.	1 F. 1 F.	13	76	On the point In the fortifica- tions	50° 42' 4"	1° 32' 9"	Substituted for old lights. The lights are 223 yards apart, in a N.E. by E. $\frac{1}{4}$ E. direction. A light is shown in the lighthouse up the Solent.	2	
Dungeness.	-	-	-	-	-	-	The lighthouse shows a <i>Red</i> light from N.E. by E. $\frac{1}{4}$ E. and W. to the land respectively, to mark the anchoring ground on either side of the Ness.	3	
Lowestoft.	1 F. <i>Red</i> .	-	40	On the Ness	-	-	In place of low light now removed, Shows <i>Red</i> to seaward between the bearings of N.N.E. and S.W. $\frac{3}{4}$ S., and <i>White</i> from those bearings to the shore. A Fog-bell.	5	
"	-	-	-	-	-	-	A <i>Red</i> light is now shown in the high lighthouse, between the bearings of N.E. $\frac{1}{4}$ N. and N.E. $\frac{3}{4}$ E., at about 12 feet below the white light.	5	
"	-	-	-	-	-	-	The <i>Red</i> light on the north pier- head of the harbour is now masked from the bearing of N.E. by E. $\frac{1}{4}$ E. westward to the north.	5	
Tees Bay.	-	-	-	-	-	-	The lights on Bran Sand and Gare lightvessel have been dis- continued. Great changes will probably be effected in the lighting of the river.	7	
Buddonness. (River Tay)	-	-	-	-	-	-	New lights of increased power. The high light must be kept open northward of the low light, bearing N.W. $\frac{3}{4}$ N., to cross the bar. The sands at the entrance have shifted.	8	

## LIGHTS AND TIDES OF THE WORLD.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	Page in Book.	1. Name of Light.
					Lat.	Long.			
Ru Stoer.	1 (Intended.)		Miles	Feet.	-	-	-	11	Stavanger.
Dubh Artach.	1 (Intended.)		-	-	-	-	-	11	Dusevig.
Workington.	1 F. (gas.)		-	-	-	-	-	12	Fruhohn. Calais.
Bristol Channel.	1 R. (flash ev. 15 s.) 1 F. Red.	10	38	West end of the One-Fathom Bank	51 20.1	3 17.1	Lightvessel in 8 fathoms, with the word "Breaksea" upon its sides.	15	
"	1 F. Red.				51 24	3 33			
Bristol Channel.	1 F. Red.	-	-	Bridgewater Low Light- house	51 15	3 0	A Red light is now shown from this building between N. 81° W. and N. 86° W.; and also be- tween S 11° W. and S. 18° W.	16	Bay of Biscay. Gijon.
Porthewal.	1 F. White, Red & Green.	10	34	On south-east end of Break- water	51 29.4	3 41.9	From the lighthouse the light is White between W. by N. $\frac{1}{4}$ N. and S.W. by W. $\frac{1}{4}$ W.; Red between W. by N. $\frac{1}{4}$ N. and N.W. $\frac{1}{4}$ N.; Green between S.W. by W. $\frac{1}{4}$ W. and S.E. $\frac{1}{4}$ S. The White light shows the fairway from westward to the harbour.	15	Oporto. Espozende. Gundiana River
"	2 F. Red.	3	37½ and 44½	On north-west end of Break- water	-	-	Shown only when the gate at the harbour entrance is open to vessels. When in one they bear N. 35½° W.	15	Cartagena.
Westcappel.	1 F.	10	46	On a sand hill, north of Zoute- land; S. 15° E. from West- cappel light	-	-	Shown over an arc of 30° (South to S. 30° E. from the light.)	21	Valencia. Rosas Bay.
"	2 F.	10	47 and 90	On the sand hills, immedi- ately south of those named Kaapduinen	-	-	377 feet N. 32° W. and S. 32° E. from each other. The arc il- luminated is from N. 17° W. to N. 47° W. from the lights (30°) Var 18° 55' W.	21	Villanueva y Geltru. Marseille.
Hoek of Holland Kattegat.	1 F. Red.	6	19	On the Hoek	51 56.8	4 5.5	-	22	
"	-	-	-	-	-	-	The Trindelen, Kobbergrund, and Anholt Lightvessels are now only removed from their stations when ice in the Kat- tegat is so abundant as to render navigation impossible.	27	Cape Couron Villa Franca "
Svinbadarne.	2 F. Red.	6	26	Lightvessel in about 12 fms.	56 10.1	12 30.1	Should be always passed on its west side. A bell in foggy weather.	30	St. John
Great Horst.	1 R. ev. 20 s.	20	200	At the village of Great Horst	54 5.1	15 4.9	-	31	Calvi.
Somnars. Trelleborg.	1 R. ev. min. 2 F.	- 4	- -	- On the mole	- 55 22.5	- 13 9.3	Substituted for the fixed light. When in one bearing N.E. $\frac{1}{4}$ E. they lead in.	33 35	Bonifacio Stra Rapallo Bay (Gulf of Ge)
Oland.	1 F.	9	25	Ispe udd	56 44.1	16 30.1	-	35	



## LIGHTS AND TIDES OF THE WORLD.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	Page in Book.	1. Name of Light.
					Lat.	Long.			
Sardinia.	1 F.	Miles 30	Feet. 541	Cape Bellavista	39 55.8	9 43.3	- - - -	60	Dniestr River
"	1 F.	23	264	Cape Sparti- vento	38 52.6	8 50.8	- - - -	60	Sur.
San Remo.	1 F. 1 F. <i>Green</i> .	4 3	29 28	At the extrem- ities of the moles	43 48.9	7 46.9	- - - -	60	Saida.
Ponza Island.	1 F. (flash ev. $\frac{1}{2}$ min.)	26	-	Monte Della Guardia, at the south end of the Island	40 53.1	12 57.4	- - - -	62	Oran.
Catania.	1 F. (flash ev. 3 min.)	14	96	Sciara Piscari	37 29	15 5.2	- - - -	63	Lanzarote
Messina.	1 F. <i>Green</i> .	-	-	Salvatore Fort	- -	- -	<i>Red</i> light not now shown.	63	"
"	1 F. <i>Red</i> .	-	-	N. by W. from San Ranieri	- -	- -	<i>White</i> light now discontinued.	63	"
Taranto.	1 F.	-	49	San Paolo Islet	40 24.4	17 10.1	Seen through an arc of 240°, or when bearing from about E. $\frac{1}{2}$ N. round by north to S.S.W. $\frac{1}{2}$ W. Var 11° 20' W.	64	Canaries.
Palermo.	1 F. <i>Red</i> .	1	24	- -	- -	- -	From a vessel moored off the mole.	64	Madeira.
Cape Santa Maria di Leuca	1 F. (flash ev. $\frac{1}{2}$ min.)	27	335	Near the ex- tremity of the Cape	39 47.7	18 23	- - - -	64	Fernando P.
Mattinata.	1 F. (flash ev. 3 min.)	18	253	Rossa Point	41 40.8	16 2.7	- - - -	65	Cape Verde
Pirano.	2 F. <i>Red</i> .	2	15	Extremities of the piers	45 31.2	13 33.8	- - - -	65	Natal.
Ravenna.	1 F. (flash ev. $\frac{1}{2}$ min.)	10	85	Near Corsini Canal	44 28.9	12 17	Substituted for old light. Par- ticulars of light uncertain.	65	"
Black Sea.	1 F. (flash ev. 2 min.)	15	174	Cape Kouri	41 52.5	28 4.3	- - - -	70	"
"	1 R. ev. min.	16	164	Near the ex- tremity of Cape Kaliakra	43 21.5	28 30.3	- - - -	71	"
River Bug.	1 F.	6	29	Weyers Spit, left bank of river	- -	- -	Shown over an arc of 180°, be- tween N.N.E. $\frac{3}{4}$ E. and S.S.W. $\frac{3}{4}$ W. (Var 4° 35' W.)	71	Ratni Ghir
"	1 F. <i>Red</i> .	8	55	51 $\frac{1}{2}$ yards N.E. $\frac{1}{2}$ E. from the white light	- -	- -	- - - -	71	Bombay.
Kinburn Pass.	1 F. 1 F. <i>Red</i> .	-	170 112	- -	46 37.7	31 45.7	Substituted for the Kinburn Beacons, which have been re- moved. When in one they bear E. by N. $\frac{1}{2}$ N. and W. by S. $\frac{1}{2}$ S., distant 7 cables nearly; the <i>Red</i> light is the easternmost. (Var 4° 40' W.)	71	Colombo.
Voloiskaia Spit.	- -	-	-	- -	- -	- -	This light is visible between the bearings of N.W. by W. $\frac{1}{2}$ W. and W. by N. $\frac{1}{2}$ N. It is also exhibited between the line of from Little Dereklea, on the west bank of the river, and S. $\frac{3}{4}$ W.; this bearing passes a cable's length westward of Arjinskaia Bank.	71	Banjoewan (Java.) Rangoon. Mindanao. Hakodadi. Kiusin Isla (Japan)

LIGHTS AND TIDES OF THE WORLD.

5

Page in Book.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	Page in Book.
						Lat.	Long.		
						° N. ' "	° E. ' "		
60	Dniestr River.	2 F.	Miles 8	Fect. 34 & 79	- -	46 4.7	30 21.2	These lights are only shown so long as the navigation is possible.	71
60		2 F. <i>Red.</i>	8	21 & 41					
60	Sur.	2 F.	5	about 56	On Battery on the west side of the town	33 17	35 14.8	Vertical.	73
62	Saida.	2 F. <i>Red.</i>	5	about 62	Near the south point of the Island	33 34.3	35 21.5	Vertical.	73
63	Oran.	1 F. <i>Green.</i>	3	-	Near the extremity of the mole now constructing	- -	- -	- - - -	75
63	Lanzarote	2 F. <i>Red.</i>	6	-	Port Naos	28 57.4	13 33	- - - -	76
63	"	1 F.	12	51	Point Pechiguera	28 50.9	13 52.4	Illuminates an arc of 223°, comprised between Point Papagayo and N. 13½° W.	76
64	Canaries.	1 R. ev. min.	25	207	Campvida point, Palma Island	28 50.1	17 46.9	Illuminates an arc of 230°, comprised between Gaviota and Barlovento Points.	76
64	Madeira.	1 F. <i>Red.</i>	8	112	In Fort on Loo Rock, at Funchal	32 37.7	16 55.1	- - - -	76
64	Fernando Po.	1 F.	5	-	Fernando point, Isabel Bay	- -	- -	No particulars published.	77
65	Cape Verde.	1 R. ev. ¼ min.	-	380	Hill, west of the Cape	14 43.3	17 32.4	Always visible from Dakar, at a distance of 5¼ miles, but from Gorée the fixed light is not distinguished.	77
65	Natal.	1 Rev. ev. ¼ min.	24	292	On the bluff, south side of the entrance	S. 29 52.8	E. 31 3.6	When the light bears W. & W. haul in to the northward for the anchorage and anchor in 8½ to 10 fathoms, with the light bearing S.W. or S.W. ¼ S., distant one mile. Var 27° W. (1866.)	78
70						N. 16 59	73 15.8	Var 0° 20' E.	80
71	Ratni Ghiri.	1 F. <i>Red.</i>	18	-	On an old Fort	- -	- -	<i>Intended.</i>	80
71	Bombay.	1 F.	-	-	Khundari Id.	- -	- -	<i>Intended.</i>	80
71	"	1 F. <i>Red.</i>	-	-	In outer light-vessel	- -	- -	<i>Intended.</i>	80
71	Colombo.	1 F.	18	134	Clock-tower in the centre of the Fort	6 55.9	79 48.7	Replaces the old light.	81
	Banjoewangie (Java.)	1 F.	8	41	- -	8 12.3	114 20.2	When entering the roadstead of Banjoewangie steer in with the light bearing West.	83
71	Rangoon.	Lightvessel.	-	-	- -	16 16	96 19.6	The Lightvessel has been shifted to this position. It now lies in 3½ fathoms.	83
	Mindanao.	1 F. <i>Red.</i>	6	32	On the Quay at Samboangan	6 54	122 5.8	- - - -	84
	Hakodadi.	1 F.	5	21	Extremity of shoal	41 47.5	140 44.6	A lightvessel.	85
	Kiusiu Island (Japan)	1 F. (Wood fire)	12	-	Isaki point	- -	- -	Existence doubtful.	85



## LIGHTS AND TIDES OF THE WORLD.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	Page in Book.	1. Name of Light.
					Lat.	Long.			
Adelaide.	1 F. <i>Red.</i>	Miles 6	Feet. 27	Semaphore Jetty, Lefevre Peninsula	S. °	E. °	Shown seaward from S. $\frac{1}{2}$ E. to N.W. by N., by westward. The old red light has been dis- continued. A lighthouse will be erected on the south sand- head of the outer bar, when the Lightvessel will be removed.	86	Laguna de Terminos. River Plate. Valdivia.
Geelong.	1 F. <i>Red.</i>	-	-	-	-	-	Placed on the first red dolphin in shore of the Lightvessel.	88	Umqua River Cape Gregory
Fitzroy River.	1 F. <i>Red.</i>	-	-	Upper Flats	-	-	A Lightvessel.	89	
Port Curtis.	1 F.	-	-	Gatcombe Head	-	-	<i>Temporary.</i>	89	
Newcastle (Australia.)	4 F. <i>Red &amp; White.</i>	-	-	-	-	-	Two of the lights are behind the town, and two on the Break- water. When either set of lights is in one, the white light will be uppermost.	89	
Newfoundland.	1 R. ev. $\frac{1}{4}$ min.	-	-	Cape Race	N.	W.	The fixed light has been discon- tinued.	92	
"	1 F.	-	-	Cape Pine	-	-	The revolving light has been dis- continued.	92	
Prince Edward Island.	1 F.	14	80	North point	47 3·8	63 59·2	-	96	
West Quoddy Head	-	-	-	-	-	-	The Fog-bell has been removed and a Daboll trumpet substi- tuted. The blasts are of 5 s. duration after intervals of 20 s.	99	NAVIG
Buzzards Bay.	1 F.	10	40	Half-a-mile S.E. of Hen and Chickens' Reef	41 27·3	71 0·9	Lightvessel in 9 fathoms.	104	The Princ
Chesapeake Bay.	1 F.	10	35	Off the north point of Sharp Island, entr. to Choptank river	38 37	76 21	On screw piles in 7 $\frac{1}{2}$ feet at mean tide.	111	Es
Albemarle Sound.	1 F. <i>Red.</i>	10	35	On bar of North river	-	-	A screw pile building in 3 $\frac{1}{2}$ feet.	113	THIS Wor
"	1 F.	10	35	Entrance to Roanoke River	-	-	A screw pile building in 7 $\frac{1}{2}$ feet mean tide. The lightvessel has been removed.	113	the Scien
Cape Fear River	1 F. 1 F.	9 9	45 33	Oak Island	-	-	The high light illuminates the horizon; the low light only 180°.	114	Indian Ocean
"	-	-	-	Bald Head	-	-	The light on Bald Head has been discontinued, but the tower remains.	114	PART
St. Thomas. (Virgin Ids.)	-	-	-	-	-	-	A <i>Red</i> light on the buoy on Oxholm Shoal; a <i>Green</i> light on the buoy on Rhodes Bank. Lighted only for the use of the steamers.	121	tribution of the
Jaemel.	1 F.	-	-	-	18 12	72 34	<i>Said</i> to have been established on the innermost white rock in Jaemel Bay.	121	embracing eve

NAVIG

The Princ

Es

THIS Wor  
the Scien  
Indian Ocean

PART

tribution of the  
embracing eve  
of Places, giv  
retardation of  
China Seas d  
Indian Ocean  
Temperature  
the Work etcIn sel  
examined; a  
numerous to  
directions for  
compiled by  
The in  
with instan  
Indian Ocean

# LIGHTS AND TIDES OF THE WORLD.

7

Page in Book.	1. Name of Light.	2. No. of Lights, Character, &c.	3 Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	Page in Book.
						Lat.	Long.		
						N. ° S.	W. ° E.		
86	Laguna de Terminos.	1 R. cv. $\frac{1}{2}$ min.	14	99	Point Xicalango	18 37.8	91 54.9	- - - - -	123
	River Plate.	1 F.	-	-	Panela Rock	34 54.6	56 24.3	Lightvessel.	125
	Valdivia.	1 F. (flash.)	8	121	Castle Niebla point	39 52	73 24.5	- - - - -	126
	Umqua River.	-	-	-	-	-	-	The light has been discontinued.	127
88	Cape Gregory.	1 F. (flash)	15	75	On islet off the Cape	43 20.6	124 22.3	Duration of flash 3 s.; duration of eclipse 3s.; intervals between flash and eclipse 2 min.	127
89									
89									

**PRICE 21s.**

## INDIAN OCEAN DIRECTORY.

### THE SEAMAN'S GUIDE

TO THE

### NAVIGATION OF THE INDIAN OCEAN AND CHINA SEA,

INCLUDING

The Principal Ports on the South and East Coasts of Africa, in the Arabian Sea and the Bay of Bengal, and on the West and South Coasts of Australia, together with a full account of all the Islands,

By **W. H. ROSSER**, and **J. F. IMRAY, F.R.G.S.**

*Extensively Illustrated with Wind, Current, and Tract Charts; Plans of Harbours, Charts of Islands, &c., &c.*

**T**HIS Work is in Two Parts—one devoted to those Physical Phenomena, the study of which is now so inseparably connected with the Science of Navigation; the other being a description of, and Sailing Directions for, the Ports, Harbours, and Islands of the Indian Ocean

**PART I.** comprises more than a general description of the AIR and the OCEAN. It enters with considerable detail into the Distribution of the Winds and Seasons (Monsoons), and gives a full account of Cyclones, and their development in both Hemispheres—embracing every department of Meteorological Science in its relation to Navigation. Next follow the Tides, with an Alphabetical List of Places, giving the Times of High Water at Full and Change of the Moon. The Currents are mighty agents in the acceleration or retardation of a voyage; these, therefore, are largely dwelt on, and their strength and approximate boundaries in the Indian Ocean and China Seas defined. The region of Ice and Icebergs, the Northern limit of these dangers to Navigation, and the parts of the Southern Indian Ocean where they may be expected in the greatest numbers, appropriately find a place here. The Specific Gravity and Temperature of the Water, together with the Deep Sea Soundings, are subjects that have not been forgotten; and then this portion of the Work closes with a brief survey of Whaling Grounds.

In selecting the materials for **PART II.**—the **SAILING DIRECTIONS**—every recognised authority (English and French) has been examined; and the names of Marine Surveyors and Harbour Masters, in many instances already familiar to the Seaman, but too numerous to mention in this place, will be found appended to the information furnished by each. As regards the description of, and directions for, the Islands, the South Coast of Africa, and the east side of the Bay of Bengal, these have been carefully and exclusively compiled by Mr. J. F. IMRAY, F.R.G.S., and are probably more extensive than in any other work relating to the same places.

The important question of How and Where to make a Passage at any given time of the year, is fully discussed, and instructions (with instances), given on the subject. Lastly, come a few brief remarks on Magnetism and the Progress of the Tide Wave in the Indian Ocean.

London:—**JAMES IMRAY AND SON,**  
MINORIES AND TOWER HILL.

PRICE 6s.

**SAILING DIRECTIONS**  
FOR THE PRINCIPAL PORTS IN THE  
**BAY OF BENGAL,**  
WITH REMARKS UPON THE  
**WINDS AND CURRENTS,**  
AND SPECIAL INSTRUCTIONS FOR MAKING  
PASSAGES UP AND DOWN THE BAY,  
By **W. H. ROSSER, and JAMES F. IMRAY, F.R.G.S.**

This Work will be found especially useful by Masters of Vessels frequenting the Rice Ports of India.

Established January 1st, 1854, and Published on the First Day of every Month, Price Sixpence,

THE  
**MERCANTILE MARINE MAGAZINE,**  
AND  
**RECORD OF THE ROYAL NAVAL RESERVE.**

THE attention of Seamen, and of all interested in Navigation, Seamanship, and the Meteorology and Physical Geography of the Sea, is called to the above Publication, which has now reached its Fourteenth Year. Every branch of Science connected with Shipping embraced in its pages—Winds and the Law of Storms—Tides and Currents—Magnetism and the Deviation of the Compass—Sailing Directions—the Capacities of Harbours, &c.; added to which there is a regular **Registry of the Establishment of all new Lights and of changes in those already existing—a List of all new Buoys and Beacons—as well as a full account of Rocks and Shoals as they are discovered,** together with new and more accurate determinations of the positions of such of these Dangers as are at first known only by name.

On the whole the intelligence is of a varied cast, but especially intended to arouse a spirit of enquiry where that is dormant, and stimulating others to continued research and careful investigation of all that may benefit Navigation and promote Science.

In collecting the information and arranging the materials necessary to render this Magazine a Work of reference, as well as of general interest, neither labour nor expense is spared.

Books relative to Nautical Affairs are reviewed, and brought constantly to the notice of Seamen.

Correspondents will, at all times, receive that prompt attention which the nature of their subject demands.

Vols. I. to XII., BOUND IN CLOTH, 7s. 6d. EACH. BACK NUMBERS MAY ALSO BE OBTAINED.

Published by **JAMES IMRAY & SON, 89, MINORIES, LONDON,**

*Where all communications for the "Editor" are to be addressed.*

Sold by all Nautical Booksellers and Instrument Makers in every Seaport in the Kingdom.

## INTRODUCTION I.

### LIGHTHOUSES, BEACONS, AND BUOYS.

THE early history of BEACON LIGHTS for the guidance of mariners is as obscure and mythical as is that of the Mariner's Compass; but it may well be assumed that the advantage of such beacons would not be unappreciated by those trading nations of antiquity that owed a large part of their commerce—and consequent wealth and greatness—to the maritime enterprise fostered among them. Nor is it at all improbable, that while the "watch-tower," by whatever means illuminated, indicated to the seaman his near approach to a well-frequented and populous haven, the majority of the beacons would be little else than "*wood-fires* burnt under an open shed," similar to those of the Japanese in our own time; and though no scientific hydrographer in those days might have cautioned the mariner "not to place too much confidence in such lights, especially in wet weather when the fire is replenished with damp fuel, for it then becomes very dim, and is sometimes temporarily obscured,"—this knowledge must often have been acquired by fatal experience.

Of the antiquity, however, of beacon lights there is no question; and that some of them must have been of a superior character is equally certain, else HOMER's simile ("Iliad," XIX.) when describing the shield of Achilles would be inapplicable:—

"So to night-wandering sailors, pale with fears,  
Wide o'er the watery waste a light appears,  
Which on the far-seen mountain blazing high,  
Streams from some lonely watch-tower to the sky."

But of all ancient lighthouses the most celebrated was the Pharos of Alexandria, built in the reign of PTOLEMY PHILADELPHUS, about 300 years before the Christian era. It stood on the island of Pharos, whence its name, and consisted of several stories of white stone, having windows in the upper stories looking seawards; and, unless the passage from Pliny, where he explains how its continuous light distinguishes it from a star, is misunderstood, it could scarcely have been illuminated by the flickering flames of an open fire. It is said to have cost a sum equal to 390,000*l.* of our money.

STRABO tells of a magnificent lighthouse at Apio, near the harbour of Menestheus (the modern Puerto de Santa Maria), as a guide for the shallows at the mouth of the Guadalquivir; tradition also indicates that the tower of Coruña (the tower of Hercules) was at an early period erected for the use of the Irish in their frequent intercourse with Spain; while peculiar ruins, described in some rather obscure passages of our ancient historians, have led to the belief that there were lighthouses at Dover, Boulogne, Flamboro' Head, St. Edmund's Chapel, Norfolk, and a few other places,—but these are mere conjectures; and, indeed, on the whole, our knowledge both of the light towers of the ancients and of their mode of illuminating them is extremely vague.

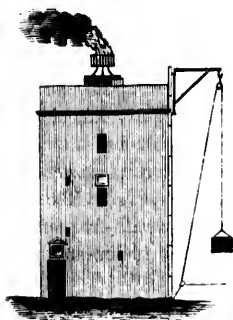
From the uncertain we pass to the certain, and we find that the requirements of navigation, in respect to lighthouses, were not admitted to be of much importance before the middle of the sixteenth century, when the Scaw and the Anhalt island lighthouses were erected by the Danes, and the tower of Cordouan by the French;

but progress in this department was at first very slow, and far from keeping pace with the rapid development of commercial enterprise,—so much so that all improvements in the construction of the buildings, and in the mode of illumination, are of modern date.

Some of the structures and their sites are of especial interest; to these, therefore, we particularly refer.

The illuminating apparatus of lighthouses in the time of our forefathers was very different from that which now-a-days casts its welcome gleams afar from sunset to sunrise; all the early structures were lighted, either by *blazing faggots of wood burned in an open chauffer*, or they were *open coal fires*, which, from the very nature of the material, and its exposed position at the top of the beacon tower, must have been most inefficient when its distant flame would have been most appreciated by the storm-tossed mariner.

The accompanying woodcut shows the old beacon tower on the isle of May, at the entrance to the Firth of Forth, Scotland; the summit was crowned by a chauffer, in which a coal-fire was burnt during the long period of 181 years—from 1635 to 1816; the fuel was raised to the top by means of a pulley and box, fitted outside the tower. “The consumption of coal in this open chauffer was latterly about four hundred tons per annum; it was one of the best coal-fires in the kingdom, and three men were employed to keep the bonfire burning;—but its appearance was ever varying; now shooting up in high flames, again enveloped in dense smoke, and never well seen when most required. When Mr. R. STEVENSON visited the island with a view to its purchase by the Commissioners of Northern Lighthouses, he was told by the keeper that in violent gales the fire only kindled on the *leeward* side, and that he was in the habit of putting his arm through the *windward* bars of the chauffer to steady himself while he supplied the fire with coals, so that in the direction in which it was most wanted hardly any light was visible.”



It is questionable whether such lights were better than none; but in a prospective view, at least, it is certain that, had they not been established, our present lighthouse system would not have attained to such perfection. That the changeful appearances of the chauffer fires were at times positively dangerous, is certain, for, among other disasters, H.M.'s ships *Nymph* and *Pallas* were wrecked, in December, 1810, near Dunbar, owing to mistaking the light of a lime-kiln on the coast for that of the isle of May.

Many of the English lighthouses exhibited coal fires far into the present century, and the last was extinguished at St. Bees in 1822.

**The TOUR DE CORDOUAN.**—A light tower that deserves especial notice not only from its antiquity, but from its architectural grandeur—“being unquestionably the noblest edifice of the kind in the world”—is the Tour de Cordouan, at the mouth of the river Gironde, in France. It was commenced in 1584, and completed in 1610. It consists of a pile of masonry rising in successive galleries, enriched with pilasters and friezes; and around the base of the building is a wall, 134 feet in diameter, which receives the chief shock of the waves. Within the building is a chapel, various apartments, and a spacious staircase; the uppermost gallery is surmounted by a conical tower, terminating in the lantern, above which is an elegant spire. This is one of the lighthouses in which has been exhibited every important improvement in the art of illumination;—its first light was obtained by burning billets of oak in a chauffer, then coal was substituted for wood; afterwards a rude tinned reflector was placed above the fire, to throw down the light; in 1780, oil lamps and improved reflectors were adopted; and finally, in 1822, the Dioptric apparatus of FRESNEL was introduced.

**The EDDYSTONE LIGHTHOUSE.**—The first light-tower on the Eddystone rock was designed by WINSTANLEY, and constructed of wood; it was commenced in 1696, and completed in 1698. The lantern was at first fitted at an elevation of 60 feet above the rock, but as the sea broke fairly over the top, its height was subsequently increased to 120 feet. In November, 1703, the building was under repair, when the great storm of the 26th of that month swept it away,—on which occasion WINSTANLEY and his assistants unhappily perished.

Shortly after the destruction of this lighthouse the *Winchelsea* ship of war was wrecked on the rock, and most of her crew were drowned; but nevertheless it was not until 1706 that another tower was projected, under the direction of RUDYERD. Like its predecessor, this was of wood, but of greater strength, and devoid of all architectural decoration; it lasted till 1755, when it was accidentally destroyed by fire; the height of this tower, including the lantern, was 92 feet.

No time was lost in replacing a light-tower in a position of such importance, and the eminent engineer, SMEATON, was commissioned to undertake its construction. This time the edifice was to be of stone, which SMEATON justly considered most suitable for the situation; he first landed on the rock in April, 1756, and soon made arrangements for cutting the solid rock into regular horizontal benches for the foundation, which could only be accomplished at intervals, since not more than five hours' work could be done in each tide. In June, 1757, the first stone was laid; the lower part of the tower, to 12 feet from the base, is a solid mass of masonry, the upper part consists of four rooms, one over the other; at the top is a gallery and the lantern; the building was completed in August, 1759, and in October following the light was first exhibited—a feeble light from a chandelier with twenty-four tallow candles.

Three years and three-quarters elapsed from the first stroke on the rock until the completion of the edifice as a lighthouse, but the total working time had not been more than 112½ days. From base to vane it is 89 feet, and in its construction were used 1493 blocks of stone, 1800 oak trenails, 4570 wedges, upwards of 1000 joggles, and other fastenings.

From that day to this the Eddystone Lighthouse of SMEATON has stood the brunt of many a fearful storm, and is still as firm as the rock on which it is built; it first demonstrated the fact that a durable and safe building could be erected on any outlying rock, with a surface barely uncovered for a short time during each tide—let the situation be ever so much exposed to wind and waves; and since then, similar structures have been raised near many a dangerous coast, the last such being on the Alguada reef, in the Bay of Bengal.

In September, 1810, candles were extinguished in the Eddystone, and oil substituted—twenty-four Argand lamps, with parabolic reflectors; the last improvement took place in 1845, by the introduction of a Dioptric light of the second order.

**THE BELL ROCK LIGHTHOUSE.**—The success attending the building of the Eddystone lighthouse was sure to lead to propositions for other structures in situations similarly dangerous to navigation. The Inchcape, or Bell Rock, had borne a bad name for centuries, standing as it does in the fairway of the Firth of Tay. Here, however, notwithstanding that the rock is covered to the depth of 12 feet at high-water springs, ROBERT STEVENSON, the Engineer to the Northern Lighthouse Commissioners, undertook to build a lighthouse after the model of the Eddystone. A foundation having been excavated, 16 feet below high-water springs, the first stone was laid in July, 1808, and the light first exhibited on the night of February 1st, 1811. Here, also, the base is of solid masonry to the height of 30 feet, at which height is the door, the ascent being by a massive bronze ladder. The tower is 100 feet high, 42 feet diameter at the base, and 12 feet at the top. Beside carrying a Catoptric light of the first order, a bell is tolled in foggy weather. This lighthouse was erected at the cost of 61,331*l.* 9*s.* 2*d.*

**THE SKERRYVORE LIGHTHOUSE** was constructed by MR. ALAN STEVENSON, the present engineer to the Northern Lighthouse Commissioners, and son of the engineer of the Bell Rock lighthouse. Since the erection of the edifice he has written a work full of interesting details respecting the undertaking, and therefore this description will be given in his own words:—



THE EDDYSTONE LIGHTHOUSE.

"The Skerryvore Rocks, which lie about 12 miles W.S.W. of the seaward point of the isle of Tyree, in Argyllshire, were long known as a terror to mariners, owing to the numerous shipwrecks, fatal alike to the vessels and the crews, which had occurred in their neighbourhood. A list, confessedly incomplete, enumerates thirty vessels lost in the forty years preceding 1844; but how many others which, during that period, had been reported as 'foundered at sea,' or as to whose fate not even an opinion has been hazarded, may have been wrecked on this dangerous reef, which lies so much in the track of the shipping of Liverpool and the Clyde, it would be vain to conjecture. The Commissioners of the Northern Lighthouses had for many years entertained the project of erecting a lighthouse on the Skerryvore, and with this object had visited it, more especially in the year 1814. The great difficulty of landing on the rock, which is worn smooth by the continual beat of Atlantic waves, which rise with undiminished power from the deep water near it, held out no cheering prospect; and it was not until the year 1834, when a minute survey of the reef was ordered by the Board, that the idea of commencing this formidable work was seriously embraced.

"The reef is composed of numerous rocks, stretching over a surface of nearly 8 miles from W.S.W. to E.N.E. The main *nucleus*, which alone presents sufficient surface for the base of a lighthouse, is nearly 3 miles from the seaward end of the cluster. It is composed of a very compact rock, called *gneiss*, worn smooth as glass by the incessant play of the waters, and is so small that at high water little remains around the base of the tower but a narrow band of a few feet in width, and some rugged humps of rock, separated by gullies through which the sea plays almost incessantly. The cutting of the foundation for the tower in this irregular flinty mass occupied nearly two summers; and the blasting of the rock, in so narrow a space, without any shelter from the risk of flying splinters, was attended with much hazard.

"In such a situation as that of Skerryvore, everything was to be provided beforehand and transported from a distance; and the omission in the list of wants of even a little clay for the *tamping* of the mine-holes, might for a time have entirely stopped the works. Barracks were to be built at the workyard in the neighbouring island of Tyree, and also in the isle of Mull, where the granite for the tower was quarried. Piers were also built in Mull and Tyree for the shipment and landing of materials; and at the latter place a harbour or basin, with a reservoir and sluices for scouring the entrance, were formed for the accommodation of the small vessel which attends the lighthouse. It was, besides, found necessary, in order to expedite the transport of the building materials from Tyree and Mull to Skerryvore Rock, to build a steam-tug, which also served, in the early stages of the work, as a floating barrack for the workmen. In that branch of the service she ran many risks, while she lay moored off the rock in a perilous anchorage, with *two-thirds* of the horizon of *foul ground*, and a rocky and deceitful bottom on which the anchor often *tripped*.

"The operations at Skerryvore were commenced in the summer of 1838, by placing on the rock a wooden barrack. The framework was erected in the course of the season on a part of the rock as far removed as possible from the proposed foundation of the lighthouse tower; but in the great gale which occurred on the night of the 3rd of November following, it was entirely destroyed and swept from the rock, nothing remaining to point out its site but a few broken and twisted iron stanchions, and attached to one of them a piece of a beam so *shaken* and rent by dashing against the rock as literally to resemble a bunch of laths. Thus did one night obliterate the traces of a season's toil, and blast the hopes which the workmen fondly cherished of a stable dwelling on the rock, and of refuge from the miseries of sea-sickness, which the experience of the season had taught many of them to dread more than death itself. After the removal of the roughest part of the foundation of the tower had been nearly completed, during almost two entire seasons, by the party of men who lived on board the vessel while she lay moored off the rock, a second and successful attempt was made to place a second beacon of the same description, but strengthened by a few additional iron ties, and a centre post, in a part of the rock less exposed to the breach of the heaviest waves than the site of the first barrack had been. This second house braved the storm for several years after the works were finished, when it was taken down and removed from the rock to prevent any injury from its sudden destruction by the waves. Perched 40 feet above the wave-beaten rock, in this singular abode, the writer, with a goodly company of thirty men, has spent many a weary day and night at those times when the sea prevented any one going down to the rock, anxiously looking for supplies from the shore, and earnestly longing for a

change of weather favourable to the recommencement of the works. For miles around nothing could be seen but white foaming breakers, and nothing heard but howling winds and lashing waves. At such seasons much of our time was spent in bed; for there alone we had effectual shelter from the winds and the spray, which searched every cranny in the walls of the barrack. Our slumbers, too, were at times fearfully interrupted by the sudden pouring of the sea over the roof, the rocking of the house on its pillars, and the spurting of water through the seams of the doors and windows, symptoms which to one suddenly aroused from sound sleep, recalled the appalling fate of the former barrack, which had been engulfed in the foam not twenty yards from our dwelling, and for a moment seemed to summon us to a similar fate. On two occasions, in particular, those sensations were so vivid as to cause almost every one to spring out of bed; and some of the men fled from the barrack by a temporary gangway, to the more stable but less comfortable shelter afforded by the bare wall of the lighthouse tower, then unfinished, where they spent the remainder of the night in the darkness and the cold.

"The design for the Skerryvore lighthouse was based on that of SMEATON'S Eddystone tower, adapted to the peculiar situation and the circumstances of the case at the Skerryvore, with such modifications in the general arrangements and dimensions of the building, as the enlarged views of the importance of lighthouses which prevail in the present day seemed to call for. On these peculiarities it will be unnecessary to enlarge, it being sufficient in this place to notice a few of the principal dimensions of the building, and some circumstances connected with the work.

"The quarries in Tyree having failed to produce an adequate supply of materials for the work, recourse was had to the granite rock of the Ross of Mull, access to which, free of all tax or ground-rent, was, in the most liberal manner, granted by the proprietor, His Grace the DUKE OF ARGYLL. This change of operations involved the cost of a separate establishment in the isle of Mull, as well as the expense attending the double reshipment of the materials, and their transport from Mull to Tyree, a passage of about 30 miles through a very rough seaway.

"The Skerryvore tower is 138 feet 6 inches high, 42 feet in diameter at the base, and 16 feet at the top. It contains a mass of stone work of about 58,580 cubic feet, or more than *double* that of the Bell Rock, and not much less than *five times* that of the Eddystone. The lower part of the tower was built by means of *jib-cranes*, and the upper part with *shear-poles*, *needles*, and a balance-crane. The shear-poles were similar to those used by SMEATON at the Eddystone; and the *jib-cranes* and *balance-crane* were the same as those which were designed for and first employed by Mr. ROBERT STEVENSON, in the erection of the Bell Rock lighthouse. The balance-crane used at Skerryvore, was necessarily somewhat larger than that of the Bell Rock, and was susceptible of being lengthened as the tower rose, by means of additional pieces of pillar let in by *spigot and faucet joints*. On this pillar a frame of iron was placed, capable of revolving freely round it, and carrying two trussed arms and a double train of barrels and gearing, worked by men standing on stages, which revolved round along with the framework of the crane from which they hung. On the one arm hung a cylindric weight of cast-iron, which could be moved along it by means of the gearing, so as to increase or diminish by leverage its effect as a counterpoise; and on the other was a roller. The roller was so connected with the weight on the opposite arm, as to move along with it, receding from or approaching to the centre pillar of iron in the same manner as the weight did. From the roller hung a sheave, over which a chain moved, with a hook at the end for raising the stones. When a stone was to be raised, the weight and the sheave were drawn out to the end of the arms of the crane, which projected over the outside of the walls of the tower, and they were held in their places by simply locking the gearing which moved them. The second train of gearing was then brought into play to work the chain which hung over the sheave, and so to raise the stone to a height sufficient to clear the top of the wall. When in that position, the first train of gearing was slowly unlocked, and the slight declivity inwards from the end of the arms formed an *inclined plane*, along which the roller carrying the sheave was allowed slowly to move—one man using a break on the gearing to prevent a rapid run—while the first train of gearing was slowly wound by the others, so as to take up the chain which passed over the sheave and thus to keep the stone from descending too low in proportion as it approached the centre of the tower. When the stone so raised had reached such a position as to hang right over the wall, the crane was made to



turn round the centre column in any direction that was necessary, in order to bring it exactly above the place where it was to be set; and by working either train of gearing, it could be moved horizontally or vertically in any way that was required. A *needle* is merely a beam projecting from the building, with a pulley at its outer end, through which a chain is worked by means of a crab placed inside the tower; it was used for raising the stone to such a level as to be within reach of the chain from the balance-crane on the top of the building.

"The mortar used at the Skerryvore was compounded of equal parts of limestone (from the Halkin mountain, near Holywell, in North Wales), burnt and ground at the works, and of Pozzolano earth. The mixture was carefully beaten up to the required consistency with sea-water. All the joints of each course of the building were carefully filled with *grout*, which is cement in a fluid state.

"The entire cost of the lighthouse, including the purchase of the steam-vessel, and the building of the harbour at Hynish for the reception of the small vessel which now attends the lighthouse, was 86,977*l.* 17*s.* 7*d.* The illuminating apparatus is Dioptric of the first order, and the light *revolving*.

"In such a situation as the Skerryvore, innumerable delays and disappointments were to be expected by those engaged in the work; and the entire loss of the fruit of the first season's labour in the course of a few hours, was a good lesson in the school of patience, and of trust in something better than an arm of flesh. During our progress, also, cranes and other materials were swept away by the waves; vessels were driven by sudden gales to seek shelter at a distance from the rocky shores of Mull and Tyree; and the workmen were left on the rock desponding and idle, and destitute of many of the comforts with which a more roomy and sheltered dwelling, and the neighbourhood of friends, are generally connected. Daily risks were run in landing on the rock in a heavy surf, in blasting the splintery gneiss, or by the falling of heavy bodies from the tower on the narrow space below, to which so many persons were necessarily confined. Yet had we not any loss of either life or limb; and although our labours were prolonged from dawn to night, and our provisions were chiefly salt, the health of the people, with the exception of a few slight cases of dysentery, was generally good throughout the six successive summers of our sojourn on the rock. The close of the work was welcomed with thankfulness by all engaged in it; and our remarkable preservation was viewed, even by many of the most thoughtless, as, in a peculiar manner, the gracious work of Him by whom 'the very hairs of our heads are all numbered.'"



SKERRYVORE LIGHTHOUSE.

The proportions of the Eddystone, Bell Rock, and Skerryvore towers are respectively:—

Lighthouse.	Height of Tower above first entire course.	Contents of Tower.	Diameter.	
			At Base.	At Top.
Eddystone . . .	68 feet.	13,343 feet.	26 feet.	15 feet.
Bell Rock . . .	100 "	28,530 "	42 "	15 "
Skerryvore . . .	130½ "	58,580 "	42 "	16 "

It would not greatly interest the seaman to enter into the principles on which these outlying and sea-girt buildings are constructed. It is difficult from SMEATON'S description to define clearly the basis on which he proceeded, beyond that of general analogy; one thing, however, is certain—the Eddystone lighthouse was the first durable structure of the kind erected, and it bears a striking resemblance to the symbol of *stability* as represented in the contour of the figure of the deity Pthah of the ancient Egyptians, showing how mind

repents itself from age to age. ALAN STEVENSON, from mathematical demonstration, gives the following as the sum of our knowledge on the subject. "That as the ultimate stability of a sea-tower, viewed as a monolithic mass, depends, *ceteris paribus*, on the lowness of its centre of gravity, the general notion of its form is that of a cone; but that, as the forces to which its several horizontal sections are opposed decrease towards its top in a rapid ratio, the solid should be generated by the revolution of some curve line convex to the axis of the tower, and gradually approaching to parallelism with it; and this is, in fact, a general description of the Eddystone tower devised by SMEATON." But he himself, from the examination of four different curves—the parabolic, logarithmic, hyperbolic, and conchoidal—which might be used in the construction of the shaft of such a lighthouse, and in which the centre of gravity of the mass varies but little from 30 feet above the base, chose the third as most suitable; and consequently the shaft of the Skerryvore pillar, which he designed and superintended, "is a solid, generated by the revolution of a rectangular hyperbola about its asymptote as a vertical axis." All this may not be very edifying to the seaman, nevertheless it describes as briefly as possible, and sufficiently for ordinary purposes, the architectural principle involved; but from the first to the latest building of the kind—while all display a remarkable solidity and coherence of structure—SMEATON'S Eddystone probably surpasses the rest in beauty and effect to the eye, emerging as it does from the sea in a curve singularly coincident with that of the rock on which it is based, and is thus in a manner homogeneous to the rock as well as to itself; this, however, may possibly be the accident of position arising from the general contour of the Eddystone rock.

These are triumphs of engineering skill. It is an easy matter to erect a lighthouse on a lofty cliff, on a low promontory, or on a shingle beach; not so on a rock barely uncovered at low water, in the face of the long swell of the open ocean, and where the waves thunder on it with a pressure of 3000 to 4000 lbs. on the square foot; yet these difficulties the engineers of our day readily overcome; and, strange to say, these noble structures, in their very strength and massiveness, enforce the adoption of a form and outline far more elegant than is necessarily required for the less exposed building; so that it has been truly observed that, "taken altogether, they are perhaps the most perfect specimens of modern architecture which exist. Tall and graceful as the minar of an eastern mosque, they possess far more solidity and beauty of construction, and, in addition to this, their form is as appropriate to the purpose for which it was designed as anything ever done by the Greeks, and, consequently, meets the requirements of good architecture quite as much as a column of the Parthenon."

It is scarcely necessary to enumerate all the lighthouses that have been built on these prototypes—the latest, however, is not unworthy of notice.

The ALGUADA LIGHTHOUSE on the Alguada reef, southward of the mouth of the Bassein river, on the coast of British Birmah, was designed by LIEUT.-COL. ALEXANDER FRASER, on the model of the Skerryvore lighthouse, with alterations to suit the site. The execution of this work is remarkable as having been performed by *coolie* labour.

The Alguada reef is situated in the track of vessels bound to or from the "rice ports" of British Birmah, and a warning beacon for that dangerous spot had long been desired; except in the very calmest weather the sea is always breaking over the rocks constituting the reef, and it is certain destruction for a vessel to be cast upon it. It was not only necessary to have the lighthouse of great height, but ample room was requisite for the large establishment which the climate requires; with sufficient space for stores and provisions for six months, as, during the S.W. Monsoon, it is not only dangerous to approach, but, if approached, landing would be almost impossible.

The stone for the structure was at first obtained from the island of Kalegoak, 200 miles distant; but, though good, it did not work well; and to such an extent did this become manifest, that it was decided to abandon the quarry at Kalegoak,



ALGUADA REEF LIGHTHOUSE.

and get the remainder of the stone from Pulo Oubin, near Singapore, upwards of 1000 miles; while the difficulty in procuring skilled labourers, who had to be brought from Madras, and even from China, rendered it still more expensive.

In January, 1860, the work of cutting out the foundation was commenced, and was completed during the season. On February 14th, 1861, the first stone was laid, and, with inconceivable difficulties in regard to labour, the building steadily progressed, till, on April 23rd, 1865, a first-class *revolving light*—Dioptric apparatus of the first order—was exhibited at an elevation of 144 feet above the level of high water, and visible 20 miles.

The tower is 160 feet high from base to vane, the foundation being in the solid rock to a depth of  $7\frac{1}{2}$  feet below the level of high water-spring tides. Materials, workmen, provisions, fresh water, all had to be brought from a distance, and each landing on the reef was a battle to be fought with the elements, yet not a life was lost. Only two Europeans—COLONEL FRASER, and his assistant, LIEUTENANT M'NEILE—and only two of the natives stuck to this hard job from beginning to end, the working establishment being usually composed of new men at the beginning of each season. The Governor-General of India, when commending LIEUT.-COLONEL FRASER "for his zeal and judgment, his forethought, resource, energy, and perseverance," remarks that "it is seldom that it falls to the lot of any individual, in India especially, to carry through a work of such magnitude, extending over so long a period. The work itself is unique, certainly in the East, and, whether regard be had to cost, execution, or rate of progress, may challenge comparison with its smaller prototype—the Skerryvore."

Of the lighthouses built along the coast or on the summit of islands, our limited space does not permit of our saying much; it is well known that they are of every variety of form—some circular, some square, some hexagonal, some octagonal, &c.,—and that they are built either of stone or brick, according to the abundance of material in the vicinity, and that the keeper's dwelling and the storerooms occupy a limited area at the base of the tower. Recently, however, a novel class of towers has been introduced, consisting of *iron plates bolted together*; these are particularly adapted for places where skilled labour cannot be obtained, or where a suitable building material is not found near the proposed site. Such structures, built in England, have been erected in the West Indies and other localities. Russia has also adopted them.

The SESKAR LIGHTHOUSE, on the island of Seskar, in the Gulf of Finland, 35 miles west of Kronstat, and erected in 1858, is of this description. The tower is circular in form, and constructed of cast-iron plates, 100 in number, being 10 in height and 10 in circumference. The base of the tower is 20 feet in diameter. The top under the gallery is 12 feet, whilst the height, being 82 feet, gives it the appearance of a column of good proportions. Round the top, on the outside of the column, is a gallery projecting three feet, supported by ornamental brackets. The plates forming the column vary in thickness from  $1\frac{1}{4}$  to  $\frac{7}{8}$  of an inch, and have strong internal flanges, which are made perfectly level, and reduced to one uniform size under the planing machine. These plates are secured together by upwards of 2000 bolts and nuts of large size. In the centre of the tower is a large pipe 18 inches diameter, passing from the bottom to the top, which serves to assist in carrying the various iron floors, carries the Dioptric light, and down which passes the weight causing that portion of the light to revolve which produces the flashes. There are five wrought-iron floors carried upon wrought-iron beams, supported by the internal flanges of the plates and the centre column. These floors are reached from stage to stage by a neat wrought-iron semi-spiral staircase. The rooms are lighted by small plate-glass windows, which are provided with a clever contrivance for keeping them shut or partially open to any angle, and so securely as to resist the force of the heaviest gale of wind. On the summit of the column is placed the lantern, which is a 12-sided figure, having a base of cast-iron plates, and surmounted with solid gun-metal sash-bars, framing 36 large panes of plate glass, each half an inch in thickness. This is again surmounted by a galvanized wrought-iron framed roof, and covered with a patent fibrous slab. This slab has the advantage of being fireproof, indestructible, and resisting excessive cold and heat. Upon the top of this slab covering is again one of copper, and underneath it a galvanized wrought-iron ceiling. Upon the apex is mounted a well-arranged cowl, surmounted by an arrow forming a vane of no small dimensions.

This cowl is a large hollow ball of copper open at the bottom, and into which passes the ventilating chimney of the light. Upon the outer periphery on one side, and directly under the feather of the arrow, are pierced many small square holes, forming, however, a less aperture than the diameter of the ball. These holes being under the feather, are always sheltered from the wind; it follows that the wind in passing causes at the back of the ball a partial vacuum, and into this the heated air from the lantern and light instantly passes, keeping the light-room nicely cool, and allowing of no down draught—thus preventing that flickering of the light so frequently seen in ill-ventilated light-rooms. The tower and lantern are painted bright red, being the best distinguishing colour for hazy and foggy weather. The internal portion of the lantern in daytime is hung with strong linen curtains, to exclude the rays of the sun; and this is very necessary, for when the sun's rays fall upon the foci of the lenses of the rotatory portion of the light, they form burning glasses of so much power that it would melt the brass of the lamp. Underneath the glass windows, on the inside of the lantern, is an ornamental gallery for the purpose of reaching all portions of the light, and to enable the windows and light to be cleaned. The light is constructed according to the Dioptric system (second order) of FRESNEL.

It is well known to the navigator that there are numerous coral reefs in the Eastern seas on which, since they are situated in well-frequented highways of commerce, a lighthouse would be greatly appreciated; and now that the Dædalus and Ushruffi reefs in the Red Sea have been lighted, it is probable that other reefs may be similarly lighted in the China Sea and in Torres Strait. The erection of a lighthouse on such a site involves making a base on which to rest it—for a coral reef awash or nearly so, though a formidable danger to a ship, is not a hard rock that can be cut and worked by masons' tools; on the contrary, it is in many parts hollow and treacherous,—and the upper surface in some places so friable that it could not support pressure within a limited space. A lighthouse, therefore, for such a position must not be a massive, weighty structure, and it must be spread over an area as large as possible.

The DÆDALUS LIGHTHOUSE rests upon twelve pillars of teak 16 feet high, arranged in two concentric circles. These having been fixed in place, their feet merely standing on the surface of the coral, and their heads connected together by a suitable wrought iron framing, the space around them to the distance of 36 feet was enclosed by a fence of iron plates, set on edge (4 feet high), the top of which rises to a little above high-water mark. The enclosed space was then filled with a concrete formed of Portland cement, mixed with coral sand. Each of the teak piles has, on each side, a flat shoulder about 3 feet from its foot, under which a strong beam of timber is laid and solidly bedded in the concrete. The whole weight of the structure rests upon the area of the concrete, and does not press unduly upon any limited space. The surface of the concrete, being raised above high-water level, forms a convenient dry platform, and the lighthouse stands, as it were, on a small circular islet of artificial stone.

The superstructure of the lighthouse consists of a framework of wrought iron, which, as well as that on the Ushruffi reef, was manufactured by Messrs. G. FORRESTER and Co., at Liverpool. The whole was erected in their yard, and the several pieces marked before it was taken down, so that they might be replaced in their proper positions. The frame consists of twenty-four upright pieces, arranged like the piles below, in two concentric circles, the inner one being about 12 feet diameter at top and bottom, and the outer one 25 feet at the bottom, diminishing to 18 feet at the top. There are four tiers of uprights, each 9 feet in height, and at each tier the uprights are connected by horizontal wrought-iron beams, forming complete rings. The two circles are further connected by twelve radiating iron girders at each tier, and the whole is connected and riveted together so as to form a very rigid frame. Each tier forms a floor. The area within the inner circle is covered with cast-iron plates filled with concrete; the area between the inner and outer circles is floored with open cast-iron gratings. The inner circle is completely enclosed by plates of corrugated iron, except the required doors and windows, forming four complete rooms, one above another, about 12 feet diameter. The spaces between the uprights in the outer circle are alternately completely and half filled in, so that outside of each room is a kind of partially enclosed verandah, which, while admitting the wind both through the half-open sides and the floor gratings, shades the sides of the central enclosed room from the sun. The shade may be made more complete at pleasure by means of canvas curtains drawn over the openings. A water-tank to

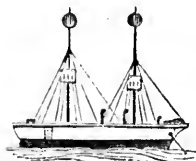
hold 15,000 gallons of water is attached to the lowest floor, and the lighthouse is furnished with a small apparatus for distilling sea-water.



Intermediate between the lighthouse erected on the shore and that stately shaft built on an outlying rock, is the mongrel edifice known as the PILE LIGHTHOUSE; of this class the number is not large. It is generally constructed of wood or iron, according to the locality,—the habitable part of the building and the lantern resting on long spider-like legs. For the shallow waters at the mouths of tidal rivers such structures are especially suitable, being used to mark the narrow navigable channels which exist between the flats of sand or mud so common in estuaries. In some cases the foundation is of such a character that the pile could not be driven home in the ordinary manner, and hence the adoption of the SCREW PILE, invented by MR. ALEXANDER MITCHELL; the first of these was erected in 1838 on the Maplin sand at the mouth of the Thames. The screw at the base of each pile consists of a *single* broad flange four feet in diameter; the piles being set upright, they are then screwed down into the sand by means of capstans, worked from the decks of dumb

lighters; these being secured, the spider legs are bolted on to them, and the whole firmly bound together by suitable ties. The Maplin light stands on nine such piles, screwed down to the depth of 22 feet. There are similar structures at the Wyre, and at Dundalk, Belfast, and Queenstown.

Lastly comes the LIGHT-VESSEL, which is only adopted from the impossibility of marking the dangers or the channels, as the case may be, by a regular lighthouse owing to softness of the banks; or where the general depth of water is too great to admit of the erection of a screw pile lighthouse; or it may be that the shifting character of the shoal renders it necessary to move the light from time to time. The first light-vessel moored on the coast of Great Britain was that stationed at the Nore in 1734; and there are now no fewer than fifty such vessels on different parts of the coast of England and Ireland.



These craft are in general ordinary-shaped, strongly built vessels, manned by sailors; they ride in depths varying from  $3\frac{1}{2}$  to 26 fathoms—except the Seven Stones, which is in 40 fathoms; and they exhibit one, two, and even three lights. The vessels are usually painted red, with the name of the shoal, channel, or gateway they are intended to indicate painted on the side in white letters; and at the masthead a distinguishing mark is exhibited during the daytime; a gong is sounded on board during foggy weather, and not unfrequently a gun is fired if a vessel is seen standing to into danger.

The cost of maintaining a light-vessel is greater than that of maintaining a lighthouse; the former requires a complement of 11 men, the latter only 3; besides which there is the expense of a periodical docking for the purpose of refitting, involving also the necessity of having spare light-vessels to replace those temporarily removed.


















The loftiest light-towers in Great Britain are those on the Skerryvore and Bishop rocks, respectively 158 and 147 feet from base to vane; but the lights are in many instances exhibited at a much greater elevation—thus the light at Barra Head stands 680 feet above high water, those on Lundy island 540 and 470 feet; and at Cape Wrath 400 feet. In Ireland the loftiest tower is the Hook—115 feet; and the loftiest light that on the Skelligs—372 feet.

But there are even greater heights than these; thus, the light on Deal island in Bass' Strait, Australia, is exhibited at an elevation of 950 feet above high-water.

As illustrating the method by which light-towers are occasionally used as a means of communicating information to vessels at sea, we give the Scaw, where, since 1852, the *signals for ice* in the Kattegat have been altered from a white and

blue flag on the old lighthouse, to the following *signal apparatus* on the Skaw new light-tower, and is exhibited as soon and as long as ice is supposed by its extent or quantity to obstruct the navigation.

The signals are made by four *black* tables on a *white* board set up towards the Sleeve or Skagerak in the *wall* of the light-tower beneath the gallery, as shown in the following Tables of Signals:—

	Ice at the Skaw.		Ice in Vinga Skærgaard.		Ice in the entrance to the Sound.
	Ice at Frederikshavn.		Ice in Læsø Channel.		Ice in Vinga Skærgaard and in entrance to the Sound.
	Ice in Vinga Skærgaard and at Frederikshavn.		Ice in Vinga Skærgaard and in Læsø Channel.		Ice in the entrance to the Sound and at Frederikshavn.
	Ice in Frederikshavn and in Læsø Channel.		Ice in Læsø Channel and at the entrance to the Sound.		Ice in Vinga Skærgaard, at the entrance to the Sound, and at Frederikshavn.
	Ice in Vinga Skærgaard, at Frederikshavn, and in Læsø Channel.		Ice in Vinga Skærgaard, at the entrance to the Sound, and in Læsø Channel.		Ice at the entrance to the Sound, at Frederikshavn, and in Læsø Channel.

These signals are always in position when any obstruction on account of ice occurs, so that a vessel approaching the Kattegat at once sees whether she can advance or no.

ON LIGHTHOUSE ILLUMINATION.—It has already been remarked that the first method of illuminating our light-towers was by *billets of wood*, for which in process of time the *coal-fire* was substituted,—and it has been recorded of these, that in wet and foggy weather their reflection could be distinguished high in the air when they were not themselves visible. Though *candles* were used in some of the earlier lighthouses, they were not often employed as a source of light; however, after SMEATON had, with so much skill and labour, erected the Eddystone light-tower, it was furnished with no better illuminator than twenty-four candles, surrounded by a common glass lantern. *Oil lamps* displaced most of the coal fires, and were in frequent use during the last century; from the tin lamp with a spout and a skein of cotton in it, through the gradations of the double wick and the flat wick to the Argand burner, the improvements were great, and especially when the latter was supplemented with a reflector.

It would be entirely beyond our purpose to enter at any great length into the subject of lighthouse illumination; in fact, without a good knowledge of OPTICS, which is one of the physical sciences involving a considerable acquaintance with mathematics, it cannot be mastered;—nevertheless, a few general ideas on the passage of rays of light through space are easily acquired and remembered.

Light, from whatever source derived, travels in straight lines, and with the almost inconceivable velocity of 192,000 miles per second; had it moved in curved lines we could have no precise knowledge of the direction of an object, nor of its figure; yet it can be turned out of its course with the greatest facility and with increased advantages. If, in passing through air, light falls obliquely on some denser body having a smooth flat surface, a portion enters the body, but the rest is turned back, or *reflected*: when the smoothness amounts to polish, it goes off at the opposite side, making an angle equal to that at which it met it,—and this is the *law of reflection*. When, however, light falls upon a transparent body, such as glass, it passes through it with comparative ease, but not in straight lines; in this case it is bent aside, or *refracted*, and the course it takes can be predicted by the well-known *laws of refraction*. On our knowledge of these two laws, and the practical

application of that knowledge, depends the perfection of lighthouse illumination—the Catoptric apparatus giving its light by reflection, and the Dioptric apparatus by refraction.

The best popular description yet published of these two systems was given in the "Cornhill Magazine" for February, 1860, and this we extract:—

"Take a bowl of copper, something like a wash-hand basin, and having shaped it carefully into a parabolic curve, and then silvered and polished the interior, set it up on its side and introduce an argand lamp into it, so that the flame of the lamp shall be in true focus, and we have a reflecting apparatus. These may be multiplied in double and triple rows, and may be either placed upon flat faces, or curved to the circle, but a lamp in the centre of a reflector is the basis of the arrangement.

"If a light were put upon a rock in the ocean without a reflector, it would be seen dimly, but all round: dimly because the light, spreading in all directions, would be weak and diluted, but visible all round because there would be nothing to obstruct it. But put this light into a twenty-one inch reflector, and we have two distinct consequences;—one that we obstruct the radiation of all the rays except those that escape from the mouth of the reflector; the other, that we reflect into the same direction as the rays that are escaping all those we have obstructed from their natural radiation.

"A twenty-one inch reflector allows the rays issuing from it to diverge fifteen degrees. So that we have the light of the 360 degrees (the whole of the circle) gathered into fifteen (a twenty-fourth part of the circle). It does not quite follow that within that area the light will be twenty-four times as strong as if allowed to dissipate itself all round, because something must be allowed for absorption and waste; but we believe this allowance has been greatly overstated, and that where there are no mechanical difficulties in the way, the reflecting system is decidedly the best. Of course where it is necessary to light more than fifteen degrees of the circle, it will be necessary to use more reflectors, placing them side by side round a shaft, and if these are set into revolving motion, focus after focus of each reflector comes before the eye of the mariner, and the effect is all that can be desired. Such is the CATOPTRIC system.

"The DIOPTRIC or refracting system of lighting is the reverse of this. In the reflector the light is caught into a basin and thrown out again. In the refracting system, in its passage through the glass prisms, it is bent up or down, and falls full upon the eye of the mariner, instead of wasting itself among the stars or down among the rocks at the lighthouse foot. For light, falling upon glass at a certain angle, does not go straight on, but gets deflected and transmitted in an altered line, as it does through water. And here comes the weakness of the Dioptric system, in close vicinity to its strength. It is true that prisms and lenses send the light in the direction which is desired, but they charge a toll for the transmission; the glass is thick, and somewhat of the nature of a sponge. If we write on blotting-paper the marks appear on the other side, but some of the ink has soaked sideways, and there is very little doubt, that when light is transmitted through glass, a good deal of it is absorbed and retained.

"To those who have never seen a Dioptric apparatus, it would be very difficult to make any written description intelligible. The reader must imagine a central lamp, with three or four circular wicks, making up a core of light four inches across, and as many high. Round this, and on a level with it, at a distance of three feet from it, go belts of glass. From these belts, or panels, the light goes straight out to sea, but as there is a great quantity of light which goes up to the ceiling and down to the floor, rings of prisms are put above and below the main panels, and these catch the upper and lower light, and bend it out to sea, parallel to the main central beam. When a revolving light has to be made by the dioptric apparatus, the lenses are so constructed that the light, in going through them, is gathered up into the exact similitude of a ray, as it would leave the mouth of a reflector, and of course with the same result; the central lamp remains stationary, and the lenses move round it, and focus after focus, flash after flash, come upon the eye of the mariner."

It is not known who first introduced paraboloid mirrors into lighthouses, but the four lights at Bidston and Hoylake, at the entrance to the Mersey, were of this character in 1763. After ARGAND, in 1784, had invented the lamp which goes by his name, and which came nearly perfect from his hands—a cylindrical wick, which admits of the flame being supplied with air inside as well as outside, and in which combustion is

greatly aided by a chimney—the method of lighthouse illumination received a considerable impetus. This lamp, with LENOIR'S improved reflectors, was first adopted in the tower of Cordouan. But about the same time experiments were being made which, when perfected, were likely to produce still more important changes. BUFFON, CONDORCET, and others, were devoting their attention to the improvement of lenses; subsequently, experiments were made by BREWSTER and FRESNEL, and on the advice of the latter the first Dioptric apparatus, illuminated by Argand burners, was established in the Cordouan tower in 1822.

Nevertheless, progress was but slow; the subject of lighthouse illumination did not then command the attention it deserved, and interests also clashed; so that it is only within the last thirty years—but especially since the appointment, in 1834, of the Royal Commission to Inquire into the Condition and Management of Lights, Buoys, and Beacons—that it has fairly kept pace with the requirements of our continually increasing commerce.

CATOPTRIC LIGHTS admit of seven distinct varieties—viz., (1) *fixed*; (2) *revolving white*; (3) *revolving red and white*; (4) *revolving red and two whites*; (5) *revolving white and two reds*; (6) *flashing*; and (7) *intermittent*.

The *fixed* light exhibit a steady and uniform appearance; the reflectors used for it are of smaller dimensions than those employed in revolving lights, in order to allow of their being ranged round a circular iron frame, with their axes inclined at such angles as to enable them to illuminate every part of the horizon.

The *revolving* light is produced by the revolution of a frame with three or four sides, having reflectors of a large size grouped on each side, with their axes parallel; and as the revolution exhibits, once in a given number of seconds or minutes, a light *gradually increasing to full strength*, and in the *same gradual manner decreasing to total darkness*, its appearance is extremely well marked; eighteen, twenty, and even thirty reflectors, according to the requirements, are arranged on the faces of the revolving framework.

The succession of *red and white* lights is produced by the revolution of a frame whose different sides present red and white lights, and these afford three separate distinctions, according to the arrangement—viz., *alternate red and white*—the succession of *two white* after *one red*, and the succession of *two red* after *one white*.

The *flashing* light is produced in the same manner as the revolving light; but, by a different construction of the frame, and by a greater quickness of the revolution, a totally different appearance is the result—viz., *a rapid succession of bright flashes*, the brightest and darkest periods being but momentary.

The *intermittent* light is distinguished by bursting suddenly into view, and continuing steady for a short time, after which it is suddenly eclipsed for several seconds; in this case the arrangement is such that by the perpendicular motion of circular shades in front of the reflectors, the light is alternately hidden and displayed.

DIOPTRIC LIGHTS are divided into *six orders*, in relation to their *power and range*; but this subdivision is irrespective of their characteristic appearances, as in each of the orders lights of identically the same character may be found, differing only in the distance at which they can be seen, and the expense of their maintenance.

The six orders of Dioptric lights may be briefly described as follows:—

Lights of the *first order* have an internal radius or focal distance of  $36\frac{1}{2}$  inches, and are lighted by a lamp of four concentric wicks, consuming 570 gallons of oil per annum.

Lights of the *second order* have an internal radius of  $27\frac{1}{2}$  inches, and are lighted by a lamp of three concentric wicks, consuming 384 gallons of oil per annum.

Lights of the *third order* have an internal radius of  $19\frac{3}{4}$  inches, and are lighted by a lamp of two concentric wicks, consuming 183 gallons of oil per annum.



Lights of the *fourth order* have an internal radius of  $9\frac{1}{2}$  inches, and are lighted by a lamp of two concentric wicks, consuming 130 gallons of oil per annum.

Lights of the *fifth order* have an internal radius of  $7\frac{1}{4}$  inches, and

Lights of the *sixth order* have an internal radius of 6 inches, and are lighted by a lamp consuming 48 gallons of oil per annum.

These orders have also various minute subdivisions. The fourth, fifth, and sixth generally form *harbour lights*.

As before observed, this distribution into orders merely characterizes the power and range of the lights, and hence different orders are adopted for different localities, according to the *position* in which the light is to be established, whether as a *sea-light*, a *secondary light*, or a *harbour light*. Each of the orders, however, by means of certain combinations which produce various *appearances*, is susceptible of being distinguished as *fixed*, *fixed varied by flashes*, and *revolving*; but the second distinguishing term, "fixed varied by flashes," is not correct for all distances, since within a portion of the range a momentary eclipse precedes the flash, and thus "fixed, with short eclipses," becomes more appropriate.

The two systems here briefly described—the Catoptric, which implies oil lamps and mirrors, and the Dioptric, which implies oil lamps and lenses, have undergone at different times many modifications; the two systems also admit of peculiar adaptations, such that they become respectively the Diacatoptric, or the Cata-dioptric, according to the method of combination; and more recently still we have the *azimuthal condensing catadioptric* Holophotal apparatus, which is supposed to utilize the whole of the available light; but into the several merits of these it is unnecessary to enter, suffice it to say, that as the name of FRESNEL must always be inseparably connected with the Dioptric apparatus, so that of the family of STEVENSON will always recur to the mind whenever the combination of the two early systems of lighthouse illumination is spoken of.

The following sufficiently indicate two of the important modifications introduced by MR. THOMAS STEVENSON, the brother of the designer and architect of the Skerryvore, the principles of which must be more or less adopted wherever a good sea light is required.

The rays passing above or below the band of lenses are caught and sent into the desired direction, not by mirrors, but by totally refracting prisms of glass; such is the apparatus of the Horskburgh lighthouse, erected on the Pedra Branca rock in 1851; and since that date many others of a similar kind have been established both in Great Britain and abroad. In appearance, a *fixed* apparatus of this character resembles a gigantic bee-hive, the encircling bands of which are made of glass; when of the first order, it is capacious enough for several persons to get inside it at once, and walk round the central lamps, and the image of the exterior landscape may be seen in each separate prism.

Again, if the illumination of the whole horizon is not the object sought, but rather the transmission of a particularly bright beam in one or two directions, as frequently happens where there are several navigable but narrow channels, the rays passing towards the undesired quarter are caught by lenses and a row of vertical prisms, and sent exactly along the line where their brilliancy is most essential to the seaman.

The *sources of light* are now-a-days many, but in the principal British lighthouses *oil* is preferred; the use of *gas* has been advocated, and is indeed adopted in some foreign lighthouses, but it does not find favour among our authorities, except for harbour and tidal lights. The *lime* light—the brilliancy of which is very great, being produced by the incandescence of a piece of lime in an oxy-hydrogen flame—has been tried, but with less success than had been hoped for. The *electric* light has, however, been established at Dungeness, and with such beneficial results that it is intended it shall be permanent; it is remarkable for its intensity, and above all for its penetrating power in foggy weather.

A coloured light cannot be obtained except by interposing a coloured medium between the burner and the eye, consequently much light is lost by the absorption of those rays which are held back to produce the desired appearance. On this account by far the greatest number of sea lights is of the natural colour. A *red*

light is sometimes introduced for the sake of distinction; and not unfrequently a strip or band of *red* marks a dangerous shoal spot, while the sea-light is *white*. The only other colours available are *blue* and *green*; but these being visible only at very short distances, are rarely used except as harbour and tidal lights.

The distinction required for lights is no less necessary for lighthouses when a ship approaches them by day; but it cannot be said that much has been accomplished at present towards giving them such a distinctive character that a stranger could at once determine his position in a case where, owing to the prevalence of foggy weather, he has had to depend on dead reckoning in making the land. A succession of these buildings is in some instances wholly *white*, in others wholly *red*; while here and there a few are coloured *red* and *white* in horizontal bands, but on no fixed principle.

In this work the colour of the lighthouse or light-vessel is given in the Alphabetical Index, p. 137 to 149.

The two following Tables will be of service to the Mariner in determining his distance from any lighthouse:—

The DISTANCE AT WHICH A LIGHT IS VISIBLE ABOVE THE HORIZON AT SEA is proportional to the square root of its height. The effect of atmospheric refraction is to increase the distance of visibility by about the eleventh part of that which results from the consideration of the earth's curvature alone. Table I. is calculated with regard to refraction, and shows the *distance at which an object of a given height is visible above the sea horizon*.

*Rule.*—In order, then, to ascertain the distance of a vessel from a light just becoming visible, add the distance corresponding to the elevation of the light to that corresponding to the height of the observer's eye above the water.

TABLE I.—FOR FINDING THE DISTANCE AT WHICH OBJECTS CAN BE SEEN AT SEA ACCORDING TO THEIR RESPECTIVE ELEVATIONS AND THE ELEVATION OF THE EYE OF THE OBSERVER.

Height in feet.	Distance in English miles.	Distance in nautical miles.	Height in feet.	Distance in English miles.	Distance in nautical miles.	Height in feet.	Distance in English miles.	Distance in nautical miles.
5	2·958	2·565	70	11·067	9·598	250	20·916	18·14
10	4·184	3·628	75	11·456	9·935	300	22·912	19·87
15	5·123	4·443	80	11·832	10·26	350	24·748	21·46
20	5·916	5·130	85	12·196	10·57	400	26·457	22·94
25	6·614	5·736	90	12·549	10·88	450	28·062	24·33
30	7·245	6·283	95	12·893	11·18	500	29·580	25·65
35	7·826	6·787	100	13·228	11·47	550	31·024	26·90
40	8·366	7·255	110	13·874	12·03	600	32·403	28·10
45	8·874	7·696	120	14·490	12·56	650	33·726	29·25
50	9·354	8·112	130	15·083	13·08	700	35·000	30·28
55	9·811	8·509	140	15·652	13·57	800	37·416	32·45
60	10·246	8·886	150	17·201	14·91	900	39·836	34·54
65	10·665	9·249	200	18·708	16·22	1000	41·833	36·28

*Ex. 1.*—Height of Bishop Rock (Scilly) light 110 feet, visible . . . . . 12·03 nautical miles.  
 Add, for height of observer's eye, 15 feet . . . . . 4·44 „  
 Distance of Bishop Rock light . . . . . 16·47 nautical miles.

*Ex. 2.*—Height of Black Rock (Ireland) light 283 feet, visible . . . . . 19 nautical miles.  
 Add, for height of eye, at masthead, 60 feet . . . . . 9 „  
 Distance of Black Rock light, nearly . . . . . 28 nautical miles.

## LIGHTHOUSES, BEACONS, AND BUOYS.

N.B.—If desirous of ascertaining the height of a light, such that it may be visible at a given distance,—seek for the number corresponding to the height of the observer's eye, and deduct it from the proposed range of the light; then, opposite the remainder, in the column of "distance," the required height will be found in the column of "heights."

For the use of Table II. the elements are—two bearings of a lighthouse, and the course and distance made good in the interval between the bearings.

N.B.—The difference of the bearings should not be less than two or three points.

Rule.—Under the number of points contained between the course and second bearing, and opposite to the difference between the course and first bearing, will be found a number which, multiplied by the miles made good, will give the distance (in miles) at the time the last bearing was taken.

TABLE II.—FOR FINDING THE DISTANCE OF AN OBJECT BY TWO BEARINGS, AND THE DISTANCE RUN BETWEEN THEM.

Difference between the Course and 2nd Bearing in Points of the Compass.																Points	Difference between the Course and 1st Bearing in Points of the Compass.		
4	4½	5	5½	6	6½	7	7½	8	8½	9	9½	10	10½	11	11½			12	12½
1·00	0·81	0·69	0·60	0·54	0·49	0·46	0·43	0·41	0·40	0·39	0·38	0·38	0·38	0·39	0·40	0·41	0·43	2	Difference between the Course and 1st Bearing in Points of the Compass.
	1·23	1·00	0·85	0·74	0·67	0·61	0·57	0·53	0·51	0·49	0·48	0·47	0·47	0·47	0·48	0·49	0·51	2½	
		1·45	1·17	1·00	0·88	0·79	0·72	0·67	0·63	0·60	0·58	0·57	0·56	0·56	0·56	0·57	0·58	3	
			1·66	1·35	1·14	1·00	0·90	0·82	0·76	0·72	0·69	0·66	0·65	0·64	0·64	0·64	0·65	3½	
				1·85	1·50	1·27	1·11	1·00	0·92	0·85	0·80	0·76	0·74	0·72	0·71	0·71	0·71	4	
					2·02	1·64	1·39	1·22	1·09	1·00	0·93	0·88	0·84	0·81	0·79	0·78	0·78	4½	
						2·17	1·77	1·50	1·31	1·18	1·08	1·00	0·94	0·90	0·87	0·85	0·83	5	
							2·30	1·87	1·58	1·39	1·25	1·14	1·06	1·00	0·95	0·92	0·90	5½	
								2·41	1·96	1·66	1·46	1·31	1·19	1·11	1·05	1·00	0·97	6	
									2·50	2·03	1·72	1·51	1·35	1·24	1·15	1·08	1·03	6½	
										2·56	2·08	1·76	1·55	1·39	1·27	1·18	1·11	7	
											2·60	2·11	1·79	1·57	1·41	1·29	1·20	7½	
												2·61	2·12	1·80	1·58	1·41	1·29	8	
													2·60	2·11	1·79	1·57	1·41	8½	
														2·56	2·08	1·76	1·55	9	
															2·50	2·03	1·72	9½	
																2·41	1·96	10	
																	2·30	10½	

Ex.—The Bishop Rock lighthouse bore N.N.W.; after running West 12 miles, it bore N.E. by N. Required the distance of the ship from the lighthouse when the second bearing was taken?

The number of points between West and N.E. by N. is 11; between West and N.N.W. is 6. Under 11 at the top and 6 at the side stands 1·11, which, multiplied by 12 (miles) gives 13·32 miles, the distance of the lighthouse when the second bearing was taken.

This Table is equally applicable to all objects—as a rock, a lofty peak, or a headland.

Ex.—A rock bore N.N.E.; after running W.N.W. 20 miles, it bore N.E. by E. Required the distance of the ship from the rock when the second bearing was taken?

The number of points between W.N.W. and N.E. by E. is 11; between W.N.W. and N.N.E. is 8. Under 11 at the top and 8 at the side stands 1·8, which, multiplied by 20 gives 36 miles, the distance of the rock when the second bearing was taken.

In any case the distance is only approximate, as there may be errors both in the bearings and distance run.

For the quarter points interpolation will be necessary for accuracy;—thus, suppose 10½ points at the top and 6 in the side column, the number will then be 1·25, which is half the sum of 1·31 and 1·19.

The office of lighthouse-keeper is no sinecure. The rules and regulations are extremely stringent in respect to the watches and other duties; the daily cleaning and trimming of the apparatus; and the exhibiting of and attending on the light *from sunset to sunrise*, or *from the going away of daylight to the return*. Formerly the keepers of some of the outlying lighthouses were subject to many privations; but the introduction of steam has rendered the system of reliefs more certain than it could be when the tender was a small sailing-vessel.

The duty of lighting the coast of Great Britain is entrusted to three independent Boards;—in England, to the Corporation of the Trinity House, founded in the time of Henry VIII.; in Scotland, to the Commissioners of Northern Lighthouses, established in 1786; and in Ireland, to the Ballast Board or Corporation for Preserving and Improving the Port of Dublin, established in 1763. Besides these, the Local Authorities and Harbour Boards of certain ports are allowed to exercise a limited jurisdiction. But the day has passed when a great Minister of State could hope "to watch the King into a good humour that he might ask him for a lighthouse," or when the parasite of a Court can be quartered in a free and easy way on the mercantile marine, for this the mariner has much cause to rejoice, for though some of the "private lights" were unquestionably good, more were execrably bad—notwithstanding which the tolls were levied with most unscrupulous rigour.

The United States' lights and those of the maritime nations of Europe are under the control of some department of Government.

FOG SIGNALS.—It is very important that where fogs are frequent and dense, and where therefore the ordinary sea-marks cannot be discerned, some efficient means should be adopted to give timely warning of a ship's too near approach to danger. No signals at present in use to this end give even a moderate amount of satisfaction; and there is the greatest diversity of opinion both among mariners themselves and among scientific men on the instrument best calculated for the purpose. Sound prefers a homogeneous element for its transmission; but fog is a mixture of air and water, and at each of the surfaces where the two touch, a portion of the vibration is reflected and lost; hence the difficulty. In some places bell-beacons or bell-buoys are established, and on board of all light-vessels there are gongs and bells, while in some cases guns are fired at frequent intervals; but it is no less important that lighthouses should be furnished with fog-signals, and in these the steam-whistle and DOBELL'S trumpet have been tried with so much success in America, that it is probable they may come into general use.



BELL BEACON.

## BEACONS, DAYMARKS, TIDE-SIGNALS, AND BUOYS.

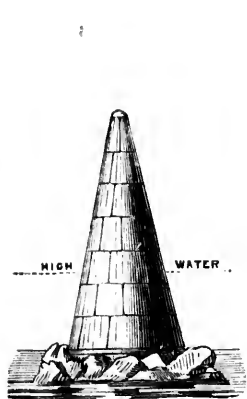
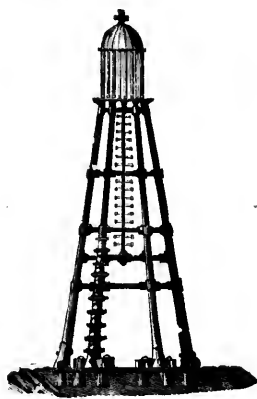


FIG. 1.



COVESEA SKERRIES BEACON.



FIG. 2.

Distance,—  
used range  
found in

nce made

site to the  
files made

EN THEM.

Difference between the  
Course and 1st Bearing in Points

the distance

top and 6 at  
and bearing

ip from the

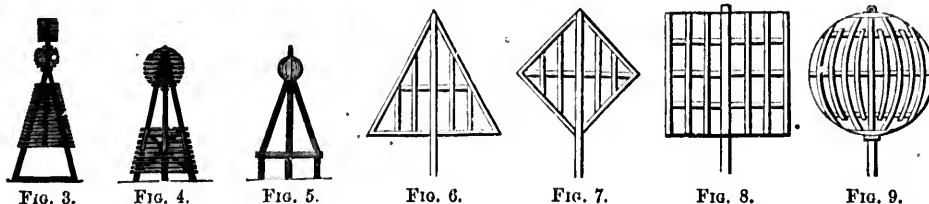
the top and  
taken.

Distance run.

at the top

BEACONS are of every variety of form and structure, and in some instances scarcely less costly than the building of a lighthouse; though generally placed on rocks or banks which are dry at some period of the tide, they are occasionally erected on the coast; in the latter case a beacon, when *in one* with some other object, is generally a leading mark to avoid a danger on entering a harbour.

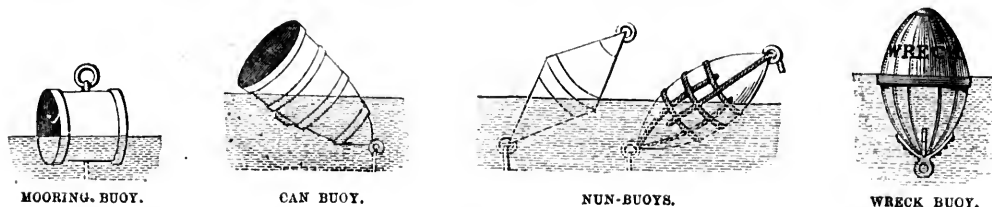
The Covesea Skerries beacon is an open framework of cast-iron pipes, firmly trussed and braced, and secured to the rock with strong *louis-bats*; others of a similar character are common on the coast of Scotland. Not a few beacons are of solid masonry, as Fig. 2; while in places not much exposed, and where the bottom is



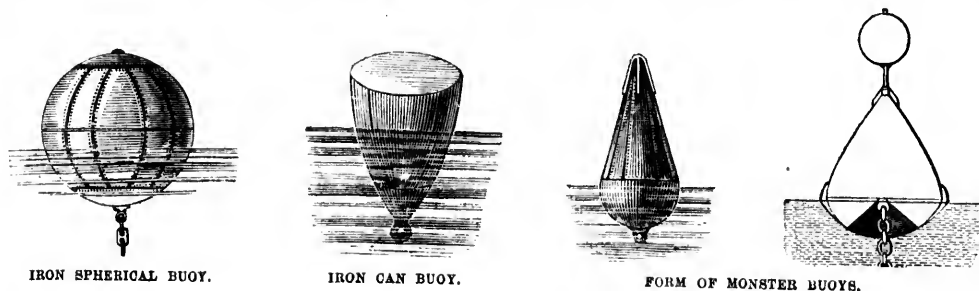
rock, gravel, or hard sand, a conical form of beacon (Fig. 1), composed of cast-iron plates, rivetted with flanges and screws, and partially filled with concrete, is used. Probably, however, the largest number of beacons, whether used as sea-marks or tide-marks, consists of a *wooden* framework (see Figs. 3, 4, and 5), which admits of being easily repaired if injured, or replaced if washed away; and these are usually surmounted by some device such as represented in Figs. 6, 7, 8, and 9. In the Baltic it is not uncommon to place a broom or two at the top of a beacon.

A large volume might be filled with the drawings and descriptions of beacons, and the purposes for which they are erected—which is a consequence of their figure and surmountings carrying no *special* significance as a sea-mark; in fact, no uniform plan is adopted by any country.

BUOYS.—The remarks just made apply with equal force to *buoys*. The old forms of these sea-marks are presented below. Mooring buoys are generally *cylindrical*, or in the form of a *cask*. Those used to mark



by day *dangers covered even at low water*, or to indicate the *fairway* of a channel, are of the description known as *Can* and *Nun* buoys, and these admit of a variety of modifications as regards form and method of mooring.



Formerly all buoys were constructed of wood, but now they are very frequently of iron; and HERBERT'S *monster buoy* is coming into common use as a *floating beacon*. (See p. xxii.)

Buoys marking the position of submerged wrecks are usually painted *green*, and have on them the word "WRECK" in *white* letters.

From the "Report respecting the Condition and Management of Lights, Buoys, and Beacons, 1861," under the head of Trinity House, England, it appears that—

"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."

As regards Scotland, the same Report states—

"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 re-painting and shifting them this season. The changes have proved somewhat extensive. 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."

While as to Ireland— the evidence is that, "by direction of the Trinity House, harbours, 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."

Indeed, it cannot be said that there is anything approaching to uniformity in buoying a channel—either as to the *kind* of buoy or the *colours* adopted—in any part of the world; and yet it might be otherwise, and, with a little more accord among the authorities, such a regular system could be introduced as would, when known, facilitate navigation, and thus relieve the anxiety of mind to which many a shipmaster is now condemned.

#### DAMAGE TO LIGHTS, BUOYS AND BEACONS.

By the 414th section of the Merchant Shipping Act of 1854—If any person wilfully commits any of the following offences:—

- (1.) Injures any lighthouse or the lights exhibited therein, or any beacon;
- (2.) Removes, alters, or destroys any lightship, buoy, or beacon;
- (3.) Rides by, makes fast to, or runs foul of any lightship or buoy;

He shall, in addition to the expenses of making good any damage so occasioned, incur a penalty not exceeding 50*l.*

## INTRODUCTION II.

### ON THE TIDES.

THERE are a few facts connected with the tides which, though generally known, may be briefly noticed. On the day of *new moon*, the sun and moon pass the meridian at the same instant (noon); at an interval after their passage the water attains its greatest height (high-water); it then falls for a period of 6h. 12m., at the end of which time it reaches its lowest height (low-water); a rise follows for a second period of 6h. 12m., producing a second high-water, and another fall during a third interval of 6h. 12m. is followed by another rise during a fourth interval of 6h. 12m. Thus the waters attain two maxima and two minima elevations (high-water twice and low-water twice), in a period of 24h. 48m., which is the average length of a tidal day.

When the moon is *full* she crosses the meridian 12h. after the sun (*i.e.*, at midnight), and the same tidal phenomena occur as at the period of *new moon*.

The range of the tides is greatest (*spring tides*) on the second or third day after new and full moon. When the moon crosses the meridian at 6h. A.M., or 6h. P.M. (being then in quadrature, or 90° from the sun), the range of the tides is smallest (*neap tides*).

Also, on the days of new and full moon, the time of high water occurs at the same interval of time from noon; this time is known as the "*establishment of the port*," and although it varies according to the geographical position of the place, it is fixed and definite for each place.

These well-known facts, constantly recurring as they do in connexion with particular positions of the sun and moon with respect to each other, would at once lead, independently of any great knowledge of physical science, to the supposition that those celestial bodies must in some way influence the waters of the ocean, so as to disturb their level; and such, indeed, is the case; but the moon is the chief agent, and her influence is in the ratio of  $2\frac{1}{4}$  to 1.

The attractive force of the moon is most strongly felt by those parts of the ocean over which she is vertical, and they are consequently drawn towards her; in the same manner the influence of the luminary being less powerfully exerted on the waters furthest from her than on the earth itself, they must remain behind. By these means, at the two opposite sides of the earth, in the direction of the straight line between the centres of the earth and moon, the waters are simultaneously raised above their mean level; and the moon in her progressive westerly motion, as she comes to each meridian in succession, causes two uprisings of the water—two high tides—the one when she passes the meridian above, the other when she crosses it below; and this is done not by drawing after her the water first raised, but by raising continually that under her at the time; this is the *tide wave*. In a similar manner (from causes already referred to) the sun produces two tides of much smaller dimensions, and the joint effect of the action of the two luminaries is this, that instead of four separate tides resulting from their separate influence, the sun merely alters the form of the wave raised by the moon; or, in other words, the greater of the two waves (which is due to the moon) is modified in its height by the smaller (sun's) wave. When the summit of the two happens to coincide, the summit of the combined wave will be at the highest; when the hollow of the smaller wave coincides with the summit of the larger, the summit of the combined wave will be at the lowest.

Now the mean interval between two consecutive returns of the moon, above and below the pole, to the

meridian of any place is 24h. 50m. 28s.; in that time two lunar high tides occur, and the mean interval between them should be 12h. 25m. 14s.; the solar tide recurs every 12 hours: thus, while the sun makes 30 waves, the moon only makes 29; supposing the summits of the two waves to coincide on a given day (at or soon after new or full moon), we have *springs*; about the fifteenth day after, the summit of the moon's wave will coincide with the hollow of the sun's, and the result is *neaps*—and so the phenomena constantly recur.

It is necessary to have a clear and distinct conception of the difference between the *motion* of a *wave* and that of a *current*. In the current there is a transfer of water; in the wave the transfer is no more than would be brought about by a particle of water impinging on another where that particle has a motion perpendicular to the surface, and the result is a rising and falling. The onward movement of the wave itself is always perceptible enough; that the water is not moving with the same velocity is also evident from watching the progress of any light body floating on its surface. This fact may be practically illustrated in the case of a ship at sea sailing before the wind in the same direction that the waves are moving; when the crest of a wave is near the stern drop a piece of wood on it; almost instantly the wave will be seen shooting ahead of the vessel, while the wood scarcely moves from where it fell on the water; but the wave has moved onward, preserving its identity as a wave, the water of which it is formed being constantly changed; and thus the motion of the wave is one thing, that of the water in which the waves are formed is quite another thing.

Again, waves are formed by a force acting horizontally; but in the case of the tide-wave that force acts uniformly from the surface to the lowest depths of the ocean, and the breadth of the wave is that curved surface which, commencing at low water, passes over the summit of the tide down to the next low-water—this is a wave of the first order. In waves of the second order, the force raising them acts only on the surface, and there the effect is greatest (as in wind-waves),—where one assists in giving to the water the oscillating motion which maintains the next, and gradually puts the whole surface into commotion; but at a short distance down that effect entirely disappears.

If the earth presented a uniform globe, with a belt of sea of great and uniform depth encircling it round the equator, the tide-wave would be perfectly regular and uniform. Its velocity, where the water was deep and free to follow the two luminaries, would be 1000 miles an hour, and the height of tide inconsiderable. But even the Atlantic is not broad enough for the formation of a powerful tide-wave. The continents, the variation in the direction of the coast-line, the different depths of the ocean, the narrowness of channels, all interfere to modify it. At first it is affected with only a slight current motion towards the west—a motion which only acquires strength when the wave is heaped up, as it were, by obstacles to its progress, as happens to it over the shallow parts of the sea near the coast, in gulfs, and in the mouths of rivers; thus the first wave advancing, meets in its course with resistance on the two sides of a narrow channel, and is forced to rise by the pressure of the following waves, whose motion is not at all retarded, or certainly less so than that of the first wave; so an actual current of water is produced in straits and narrow channels: and it is always important to distinguish between the tide-wave as bringing High Water and the Tidal Stream—between the Rise and Fall of the Tide, and the Flow and Ebb. In the Irish Sea the *current* caused by the Tide does not move faster than 5 miles an hour in any part, but the Tide-Wave (High Water) nowhere moves slower than 20 miles an hour.

A line drawn on a chart, connecting all those places where High Water occurs *simultaneous*, that is, at the same instant of absolute time, is called a *cotidal* line; and a series of such lines drawn for every hour marks the *progress of the tide-wave hour by hour*; such is the intention of the chart facing the title-page of this book.

THE ESTABLISHMENT OF THE PORT, or—as RAFFER more appropriately calls it—the TIDE HOUR, is the apparent time from noon of the *first* high water on the day of Full or Change of the Moon. It is of great importance to know this *tide hour*, since the time of high water of every succeeding tide may be approximately deduced therefrom. These Tide Hours are given in Part II. of this work.

RULE.—TO FIND THE TIME OF HIGH WATER ON A GIVEN DAY AT ANY PLACE WHERE THE TIME OF HIGH WATER AT FULL AND CHANGE OF THE MOON IS KNOWN:—Find the time of the moon's meridian passage at the place; and to this time apply the correction from Table II. according to the proper sign—entering the Table



ON THE TIDES.

with the ☽'s Mer. Pass. in the side column and the ☽'s Semidiameter at the top; to the result add the time of High Water at Full and Change at the given place, taken from the following list of places (p. 1\* to 22\*), and the sum will be the time of high water on the afternoon of the given day. Should, however, this sum exceed 12h. 24m., or 24h. 49m., subtract one or other of those times, as necessary, from it, and the remainder will be the *approximate* time of high water on the afternoon of the given day.

TABLE I.—CORRECTION—TO FIND THE MOON'S MERIDIAN PASSAGE.

Long.	Daily Variation of the Moon's passing the Meridian.													
	40m.	42m.	44m.	46m.	48m.	50m.	52m.	54m.	56m.	58m.	60m.	62m.	64m.	66m.
°	m.	m.	m.	m.	m.	m.	m.	m.	m.	m.	m.	m.	m.	m.
10	1	1	1	1	1	1	1	1	1	2	2	2	2	2
20	2	2	2	2	3	3	3	3	3	3	3	3	3	4
30	3	3	4	4	4	4	4	4	4	5	5	5	5	5
40	4	4	5	5	5	5	6	6	6	6	6	7	7	7
50	5	6	6	6	6	7	7	7	7	8	8	8	9	9
60	6	7	7	7	8	8	8	9	9	9	10	10	10	11
70	7	8	8	9	9	9	10	10	10	11	11	12	12	12
80	9	9	10	10	10	11	11	12	12	12	13	13	14	14
90	10	10	11	11	12	12	13	13	13	14	14	15	15	16
100	11	12	12	12	13	13	14	14	15	15	16	17	17	18
110	12	13	13	14	14	15	15	16	16	17	18	18	19	19
120	13	14	14	15	15	16	17	17	18	19	19	20	20	21
130	14	15	15	16	17	17	18	19	19	20	21	21	22	23
140	15	16	17	17	18	19	20	20	21	22	22	23	24	25
150	16	17	18	19	19	20	21	22	22	23	24	25	26	26
160	17	18	19	20	21	21	22	23	24	25	26	26	27	28
170	18	19	20	21	22	23	24	25	25	26	27	28	29	30
180	19	20	21	22	23	24	25	26	27	28	29	30	31	32

TABLE II.—CORRECTION TO BE APPLIED TO THE TIME OF THE MOON'S MERIDIAN PASSAGE IN FINDING THE TIME OF HIGH WATER.

☽'s Mer. Passage.	☽'s Semidiameter.			☽'s Mer. Passage.	☽'s Mer. Passage.	☽'s Semidiameter.			☾'s Mer. Passage.
	14' 30"	15' 30"	16' 30"			14' 30"	15' 30"	16' 30"	
H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.	H. M.
0 0	-0 4	0 0	+0 5	12 0	6 0	-0 55	-1 2	-1 12	18 0
0 30	-0 10	-0 8	-0 5	12 30	6 30	-0 46	-0 51	-0 58	18 30
1 0	-0 17	-0 16	-0 15	13 0	7 0	-0 32	-0 34	-0 37	19 0
1 30	-0 24	-0 25	-0 25	13 30	7 30	-0 17	-0 16	-0 14	19 30
2 0	-0 31	-0 34	-0 36	14 0	8 0	-0 1	+0 3	+0 9	20 0
2 30	-0 38	-0 41	-0 46	14 30	8 30	+0 8	+0 15	+0 24	20 30
3 0	-0 44	-0 49	-0 55	15 0	9 0	+0 14	+0 21	+0 32	21 0
3 30	-0 50	-0 56	-1 4	15 30	9 30	+0 16	+0 24	+0 36	21 30
4 0	-0 55	-1 2	-1 12	16 0	10 0	+0 15	+0 23	+0 34	22 0
4 30	-0 58	-1 6	-1 16	16 30	10 30	+0 12	+0 19	+0 29	22 30
5 0	-1 0	-1 8	-1 19	17 0	11 0	+0 7	+0 14	+0 23	23 0
5 30	-0 59	-1 7	-1 18	17 30	11 30	+0 2	+0 7	+0 15	23 30
6 0	-0 56	-1 2	-1 12	18 0	12 0	-0 4	0 0	+0 5	24 0

*Ex.*—Find the Time of High Water at Port William, E. Falkland Islands (Long.  $58^{\circ}$  W.), May 20th, 1866.

	H.	M.
☾'s Meridian Passage at Greenwich . . . . .	5	37
Cor. (Tab. I.) for Daily Variation 48m. and Long. $58^{\circ}$ W. . . . .	+	8

☾'s Meridian Passage at Port William . . . . .	5	45
Cor. (Tab. II.) for $5\frac{1}{2}$ h. and ☾'s Semid. $15'21''$ - 1 . . . . .	-	4

4 41

H.W. at F. & C. at Port William (Pt. II. p. 22*) + 5 . . . . .	+	5	15
--	---	---	----

H.W. at Port William, May 20th . . . . . P.M. 9 . . . . .		9	56
			- 24

H.W. at Port William, May 20th . . . . . A.M. 9 . . . . .		9	32
---	--	---	----

*Ex.*—Find the Time of High Water at Port Adelaide, Australia (Long.  $138\frac{1}{2}^{\circ}$  E.), May 20th, 1866.

	H.	M.
☾'s Meridian Passage at Greenwich . . . . .	5	37
Cor. (Tab. I.) for Daily Variation 50m. and Long. $138^{\circ}$ E. . . . .	-	19

☾'s Meridian Passage at Port Adelaide . . . . .	5	18
Cor. (Tab. II.) for $5\frac{1}{2}$ h. and ☾'s Semid. $15'21''$ - 1 . . . . .	-	7

4 11

H.W. at F. & C. at Port Adelaide (Pt. II. p. 1*) + 5 . . . . .	+	5	44
--	---	---	----

H.W. at Port Adelaide, May 20th . . . . . P.M. 9 . . . . .		9	55
			- 24

H.W. at Port Adelaide, May 20th . . . . . A.M. 9 . . . . .		9	31
--	--	---	----

FROM THE OBSERVED TIME OF H.W. AT ANY PLACE ON A GIVEN DAY, TO FIND THE TIME OF H.W. AT F. AND C.

*Rule.*—To the time at which the moon passes the meridian of the given place, apply the correction from Table II., and the result subtracted from the *observed* time of H.W. will give the time of H.W. at F. and C.

If the time to be subtracted exceed the observed time of H.W., add 12h. 24m., or 24h. 49m. (whichever is required to make it greater) to the observed time, and then subtract.

#### TIDE-TABLES FOR THE COAST OF GREAT BRITAIN.

By E. BURSTAL, Commander R.N.

It has frequently occurred to me that the seaman, when navigating our shores, is much perplexed to know how the stream is running, and when it will be slack, and that he has to refer to a "tide-table" of the nearest port, and deduce from the time of high water at that port the time when the stream will end where he is;—otherwise he observes that it is high water, full and change, at a certain time, and from that calculates, according to the age of the moon, what the time of high water is on the day required, and then applies the necessary correction for the time of slack water. The value of being tolerably well informed as to the tides, the set and velocity of the stream, and when it turns, must be apparent to every person having the care of navigating a vessel along the coast.

With these views of the subject after many years' service on nautical surveys on our coasts, I have been led to consider that *one uniform port of reference* will be best suited to give the seaman that information on the subject of tides. I have, therefore, made *London* that port of reference, and as every almanac has a London time-table in it, it will be only necessary to add to or subtract from the time of high water at London, as shown in the following tables, when the time of high water *slack* will be found at any point along the coasts of Great Britain and Ireland.

The time used is the local time at each position, it not being necessary to make any correction for difference of longitude with London.

I am aware that the semimensual inequalities in time with London and the various ports will, in some instances, cause a variation of 15 minutes from the truth, but as the tides are so much influenced by atmospheric changes, the result arrived at from these tables will, I venture to hope, be sufficiently correct for all the purposes of navigation.

In the following Tables—a, signifies *after*; b, *before*.

## TIDE-TABLES FOR THE COAST OF GREAT BRITAIN.

PLACE.	Time of Slack Water, or the ending of the Flood stream to S.E. before or after High Water at certain places of reference.		REMARKS.
	LONDON.		
	H. M.	H. M.	
North Ronaldsha Frith . . . . .	... ..	3 20 b.	High Water F. & C. on the shore 9h. 0m.; stream 4 knots. Springs 6 knots; neaps 3. Stream close inshore makes to the westward soon after H.W., and slacks at L.W., or 2h. 40m. sooner than in the middle; springs run 7 knots; neaps 3½. Springs 3 knots; neaps 1½.
Stronsa Frith . . . . .	... ..	2 40 b.	
Pentland Frith, middle . . . . .	... ..	2 20 b.	
Clyth Ness . . . . .	3 40 b. Leith.	3 10 b.	Off Cromarty and Fort George, 3 to 4 knots. Streams easy. Springs 2½ knots.
Cromarty, entrance of the Murray Frith . . . . .	2 40 b. Leith.	2 15 b.	
Cullen . . . . .	... ..	1 0 b.	At H.W., London. Springs 4 knots.
Kinnairds Head, 6 miles off Do. 12 miles off . . . . .	1 20 b. Leith. ... ..	At H.W., London. 1 10 a.	
Buchanness, inshore . . . . .	... ..	At H.W., London. 1 0 a.	Springs 2¾ knots; neaps 1½. Flood stream sets to W.S.W., towards Tay Bar.
Do 15 miles off . . . . .	0 40 a. Leith.	1 10 a.	
Girdleness . . . . .	0 10 a. Leith.	0 40 a.	Stream 2½ knots.
Montrose and Arbroath . . . . .	... ..	0 40 a.	
Bell Rock, 2 miles outside Between Bell Rock and Fife Ness . . . . .	2 50 a. Leith. 0 50 a. Leith.	3 20 a. 1 20 a.	Close inshore by Berwick and Holy island, the stream turns at 2h. 0m. after H.W., London, being 1½h. earlier than in the offing.
St. Abbs Head, inshore . . . . .	2 55 a. Leith.	3 20 a.	
Do. 18 miles off . . . . .	3 15 a. Leith.	3 40 a.	
Berwick, 5 miles off . . . . .	4 10 a. Leith.	4 15 a.	Stream 2½ springs; 1½ neaps—on both tides. Close inshore 20m. earlier.
Farn Islands, 5 miles off Do. close in . . . . .	... ..	3 55 a. 3 20 a.	
Coquet, 5 miles off . . . . .	... ..	4 0 a.	A good slack in Filey bay 2m. off shore on the ebb. A good slack in Bridlington bay on the flood.
Blyth, inshore . . . . .	3 40 a. Leith.	4 0 a.	
Do. 6 miles off . . . . .	... ..	4 10 a.	Flood to S. by W. from 2h. after H.W. London to 8h. after; Ebb to N. ¼ E from 3h. before H.W. London to 2h. after.
Tyne, 6 miles off . . . . .	3 40 a. Leith.	4 15 a.	
Sunderland, 5 miles off . . . . .	... ..	4 20 a.	Flood from 1 to 3h. after H.W. London, sets W. round to S.S.W.; from 3 to 7h. after H.W., London, main flood stream S. to S.S.E. 2½ knots; Ebb begins about 4h. before H.W. London, N.N.E. to N.N.W., 2½ knots, and ends ½h. after H.W. London.
Hartlepool, 4 miles off . . . . .	... ..	4 40 a.	
Whitby, 4 miles off . . . . .	... ..	4 50 a.	Flood S. to S.S.W.; Ebb N. to N.N.W. Flood S.; Ebb N.N.E.; Springs 2½ knots. Stream sets S.S.W., 1½h. after H.W. at Yarmouth; Ebb sets N. by E. ¼ E. 1½h. after L.W. at Yarmouth. Streams turn at 1½h. after High and Low Water by the Shore; the same in Lowestoft and Corton Roads.
Scarboro', 4 miles off . . . . .	... ..	5 0 a.	
Flamboro' Head, 5 miles off . . . . .	... ..	5 10 a.	The last Qr. flood sets to the N.W. over the Gunfleet. General set on flood S.W. ¼ S.; springs 2 knots.
Spurn Point, 7 miles off . . . . .	... ..	5 30 a.	
Leman and Ower . . . . .	... ..	3 30 b.	Young flood S.S.W.; half flood W.N.W.; last flood N.W.
Dudgeon Light . . . . .	... ..	7 0 a.	
Cromer, 4 miles off . . . . .	... ..	3 50 b.	The last Qr. flood sets to the N.W. over the Gunfleet. General set on flood S.W. ¼ S.; springs 2 knots.
Woud, fairway . . . . .	... ..	3 40 b.	
Hasboro' Gat . . . . .	... ..	3 30 b.	Young flood S.S.W.; half flood W.N.W.; last flood N.W.
Cockle Gat . . . . .	... ..	3 10 b.	
Yarmouth Roads . . . . .	... ..	3 5 b.	The last Qr. flood sets to the N.W. over the Gunfleet. General set on flood S.W. ¼ S.; springs 2 knots.
Lowestoft, 4 miles off . . . . .	... ..	3 0 b.	
Orfordness . . . . .	... ..	2 30 b.	The last Qr. flood sets to the N.W. over the Gunfleet. General set on flood S.W. ¼ S.; springs 2 knots.
Swin, East . . . . .	0 20 a. Harwich.	1 45 b.	
Swin, West . . . . .	0 10 b. Sheerness.	1 25 b.	The last Qr. flood sets to the N.W. over the Gunfleet. General set on flood S.W. ¼ S.; springs 2 knots.
Kentish Knock . . . . .	0 30 a. Dover.	2 30 b.	
Margate Road . . . . .	1 0 a. Dover.	2 0 b.	The last Qr. flood sets to the N.W. over the Gunfleet. General set on flood S.W. ¼ S.; springs 2 knots.
Queens & Princes Channels	1 20 a. Dover.	1 40 b.	

## BETWEEN THE NORTH FORELAND AND DOVER.

PLACE.	Time of Slack Water, or the ending of the Flood stream to the N.E., before or after High Water, at certain places of reference.		REMARKS.
	LONDON.		
	H. M.	H. M.	
N. Foreland, Elbow buoy	4 10 a. Dover.	2 10 a.	General set N.E. at buoy; N.N.E. inshore. ,, N.E. by N.; springs 2 $\frac{3}{4}$ ; neaps 1 $\frac{1}{2}$ knots. ,, E.N.E. 3 knots springs; neaps 1 $\frac{3}{4}$ knots.
Gull Stream . . . . .	4 30 a. Dover.	1 30 a.	
Dover Strait . . . . .	4 0 a. Dover.	1 0 a.	
ENGLISH CHANNEL.			
Dungeness, 7 miles W. by S. of . . . . .	Ending of Flood Stream to the Eastward.	0 45 a.	Springs 2 knots; neaps 1 $\frac{1}{2}$ ; Set E. by N. The tides from the Channel and North Sea meet off Fairlight; if a ship works up to Fairlight by the time it is High Water at Dover, she will keep an eastern stream for 4h. afterwards. Stream easy, seldom more than 1 $\frac{1}{2}$ knots. Stream strong on both tides; 3 knots. Stream easy. Stream 2 $\frac{1}{2}$ to 3 knots. All alongshore, within 3 miles of the land, the eastern stream ceases about 1h. before High Water; and after half ebb, there is an eddy tide to the eastward, inshore.
Off Fairlight and Rye Bay	3 0 a. Dover.	H.W. London.	
Hastings, 7 miles off . .	1 0 a. Hastings.	2 30 b.	Flood E. by S. $\frac{1}{2}$ S.; Ebb W. by N.; 1 $\frac{1}{2}$ knot. To S.E. by S. from H.W. at London Bridge to 6 $\frac{1}{2}$ h. after it; to N.W. by N. from 5h. before H.W. London until H.W. there. Stream runs out at the Needles from 4h. before H.W. London Bridge until 2h. 20m. after it. The Stream off the S. side of the Isle of Wight runs 4 $\frac{1}{2}$ knots close inshore; between Dunnose and St. Catherine's are several races or overfalls on both tides. Race S.S.E. distant 1 $\frac{1}{2}$ miles from the head. Race from $\frac{1}{2}$ mile to 1 $\frac{1}{2}$ mile from the Bill; stream close inshore begins to set to the Eastward at Low Water at Weymouth, and to the Westward at H.W. Very slack on both tides. Streams N.W. and S.E. Long slack. E. by S. from $\frac{3}{4}$ flood to $\frac{1}{2}$ ebb by the Dock Yard 2 miles an hour; West to N.W. from $\frac{3}{4}$ ebb to $\frac{1}{2}$ flood.
Royal Sovereign shoals . .	At H.W. Eastbourne.	3 0 b.	
Eastbourne, 1 $\frac{1}{2}$ miles off .	0 30 b. Eastbourne.	3 30 b.	
Beachy Head, 6 miles off.	At H.W. Eastbourne.	3 0 b.	
Beachy Head, inshore by 7 cliffs, and Seaford Bay	1 20 b. Newhaven.	4 5 b.	
Newhaven, inshore . . . .	1 0 b. Newhaven.	4 30 b.	
Do. 10 miles off . . . . .	At H.W. Newhaven.	2 45 b.	
Do. 14 miles off . . . . .	0 10 b. Newhaven.	3 0 b.	
Brighton and Rottinglean	0 40 b. Newhaven.	3 25 b.	
Brighton, 5 miles off . . .	0 30 b. Brighton.	... ..	
Park . . . . .	1 30 b. Portsmouth	4 0 b.	Slack at H.W. London Bridge. Flood E. by S. $\frac{1}{2}$ S.; Ebb W. by N.; 1 $\frac{1}{2}$ knot. To S.E. by S. from H.W. at London Bridge to 6 $\frac{1}{2}$ h. after it; to N.W. by N. from 5h. before H.W. London until H.W. there. Stream runs out at the Needles from 4h. before H.W. London Bridge until 2h. 20m. after it. The Stream off the S. side of the Isle of Wight runs 4 $\frac{1}{2}$ knots close inshore; between Dunnose and St. Catherine's are several races or overfalls on both tides. Race S.S.E. distant 1 $\frac{1}{2}$ miles from the head. Race from $\frac{1}{2}$ mile to 1 $\frac{1}{2}$ mile from the Bill; stream close inshore begins to set to the Eastward at Low Water at Weymouth, and to the Westward at H.W. Very slack on both tides. Streams N.W. and S.E. Long slack. E. by S. from $\frac{3}{4}$ flood to $\frac{1}{2}$ ebb by the Dock Yard 2 miles an hour; West to N.W. from $\frac{3}{4}$ ebb to $\frac{1}{2}$ flood.
Loe Stream . . . . .	1 40 b. Portsmouth	4 0 b.	
Owers, 4 miles outside . .	At H.W. Portsmouth	2 30 b.	
Spirithead . . . . .	2 30 a. H.W. "	Slack at H.W. London Bridge.	
Solent . . . . .	1 35 b. H.W. "	4 0 b.	
Needles . . . . .	1 40 b. "	4 0 b.	
Culver Cliff, 2 miles . . .	1 40 b. "	4 0 b.	
Dunnose, 5 miles off . . .	0 25 b. "	3 20 b.	
St. Catherine's, 5 miles off	0 30 b. "	3 0 b.	
Needles, 4 miles off . . .	1 0 b. "	3 20 b.	
St. Alban's Head, 2 miles off	1 50 b. "	4 10 b.	
Portland Bill . . . . .	2 20 b. Portsmouth	4 40 b.	
Do. 1 mile off . . . . .	2 35 a. H.W. Weymouth.	3 30 b.	
Beer Head . . . . .	... ..	4 0 b.	
Lyme, 13 miles S. of . . . .	... ..	4 0 b.	
Plymouth, 6 miles off . . .	2 40 a. Devonport.	6 10 a.	
Eddystone, 4 miles off . . .	3 0 a. Devonport.	6 30 a.	
Do. 22 miles off . . . . .	3 5 a. Devonport.	6 40 a.	
Lizard, 7 miles S.W. of . .	2 0 a. Plymouth.	5 30 a.	
WEST COAST OF CORNWALL.			
Seven Stones, along the North Coast of Cornwall to Hartland Point . . . .	Slack Water or Ending of Flood Stream to the Northward.	3 0 a.	Flood N.E. by E.; Ebb S.W. by W.
Hartland Point . . . . .	... ..	3 30 a.	

## BRISTOL CHANNEL.

PLACE.	Time of Slack Water, or the ending of the Flood stream to the Northward before or after High Water, at certain places of reference.		REMARKS.
	LONDON.		
	H. M.	H. M.	
Off Lundy Island . . . .	...	3 30 a.	Springs 3 knots; neaps 2 knots.
Ilfracombe . . . . .	0 30 a. H.W. byshore	4 0 a.	
Off Nash Point, in mid-Channel . . . . .	...	4 20 a.	Inshore, and Swansea Bay, slack water is 1h. earlier.
IRISH SEA (SOUTH CHANNEL).			
Smalls Light . . . . .	0 20 b. Liverpool.	3 0 b.	Flood N.N.E.; Ebb S.S.W.
Between the Smalls and Milford Haven . . . . .	0 10 b. ,,	3 20 b.	The Stream off Milford towards the Bristol Channel runs nearly 4 knots an hour at springs; general set is S.E., and slacks at 3h. 20m. after H.W. at London.
Between Tuskar and Bishop mid-Channel . . . . .	0 20 b. ,,	3 0 b.	Direction, flood N.E.; Ebb S.W. by W.; velocity 2½ knots springs.
Off Waterford, Saltees Light-vessel . . . . .	0 40 b. ,,	3 20 b.	
Irish Channel between the Tuskar and 30 miles N. of Holyhead . . . . .	0 15 b. ,,	3 0 b.	General set N.E. in the southern portions; N.E. by N. off Arklow; and N.N.E. off Holyhead; velocity about 3 knots. Inshore streams from Milford round the Bishop's run 5 knots, and take an E.N.E. direction up Cardigan Bay, running 2 knots.
Between the Isle of Man and Anglesea . . . . .	0 15 b. ,,	3 0 b.	Midway, East, 2 knots; inshore from the Skerries towards Liverpool E. by S. to E.S.E. 2 knots.
Between the Isle of Man and Dundrum Bay . . . . .			Stream scarcely perceptible.
IRISH SEA (NORTH CHANNEL).			
	Ending of Flood Stream to the S.E.		
Between Copeland Islands and Mull of Galloway . . . . .	0 15 b. Liverpool.	3 0 b.	Mid Channel S.S.E., towards the N.W. point of Isle of Man, velocity 2 knots; and E.S.E. 3 knots to the north of Point of Ayr, thence Southerly towards Morecambe Bay, 2 knots.
Donaghadee, inshore . . . . .	2 0 b. ,,	4 45 b.	Eddy on the flood, south of the Copelands; stream strong outside, 2½ knots.
Maidens . . . . .	0 30 b. ,,	3 15 b.	Flood, South, 1½ knot.
SCOTLAND (WEST COAST).			
	Ending of Flood Stream to the S.E.		
Mull of Cantyre . . . . .	0 35 b. Liverpool.	3 20 b.	Flood S.S.E. 3 to 4 knots, springs; to E.S.E. and N.N.E. up Kilbrannan Sound 1½ knot, and off to East to Frith of Clyde.
	Ending of Flood Stream to the Northward.		
Perch of Clyde or Ailsa rock Islay, Mull of Kinlo . . . . .	0 20 b. Liverpool.	3 5 b.	Streams easy on both tides in the Firth of Clyde.
	At H.W. by shore.	3 0 a.	Flood N.N.W. 5 knots, springs; 3 knots, neaps; Ebb inshore sets towards the Otter rock, and passes 2 miles South of Texa Island, when the stream from Jura Sound meets it, and thence out towards the Coast of Ireland.
Islay, Rhynns of Oversay Light . . . . .	At H.W. by shore.	3 0 a.	The ebb sets to S.W. 1¼h. before H.W., or 1¼h. earlier than outside; very strong race off Oversay Light extends 2 miles off; 7 knots springs; an eddy on the flood near the shore to the N.E. of Ru Andrew or S.W. point of Islay.

SCOTLAND (WEST COAST)—*continued.*

PLACE.	Ending of Flood Stream to the Northward.		REMARKS.
	LONDON.		
	H. M.	H. M.	
Islay, N.W. side, near Noamh Island.	1 20 a. H.W. by shore	4 30 a.	H.W. F. and C. by shore 4h. 45m.; stream 2 knots, setting East.
Off Rudha Mhail Point, N. entr. of Islay Sound	... ..	5 0 a.	Gradually turning into Islay sound, and joining the ebb stream to S.S.W. for 2h. after the time of H.W. by the shore.
Islay Sound . . . . .	Flood to N.N.E. until 1 0 b. H.W. at Feolin Ferry.	2 0 a.	Flood to N.N.E. slacks 1h. before H.W. on shore; stream to S.S.W. commences 1h. before H.W., and ends 5h. after it; velocity 4 to 6 knots off Feolin ferry; but near the North and South entrances of the Sound about 2½ to 3 knots.
	Ending of Flood Stream to N.E.		
Between South of Oronsay and Islay	2 45 a. H.W. at Oronsay.	5 30 a.	H.W. F. and C. Oronsay 5h. 0m.
Between Colonsay and Jura	... ..	... ..	Stream scarcely perceptible; mid-channel seldom more than ½ knot.
Jura Sound, East of Sgeir Macoile Lighthouse	0 30 b. H.W. on the shore.	2 20 a.	Near Sgeir Macoile Lighthouse, velocity 2½ knots, springs; streams slacken ½h. before High and Low Water.

## IRELAND (SOUTH AND WEST COASTS).

PLACE.	Ending of Flood Stream to the Eastward.		REMARKS.
	LONDON.		
	H. M.	H. M.	
Cork Harbour, 6 miles off	... ..	4 0 a.	The ebb or Western stream close inshore commences at 5h. 10m. on days of F. and C.; in the offing at 6h. 0m.; velocity 1½ knot.
Old Head of Kinsale, 6 miles off	... ..	4 20 a.	Close to the Head is a race on the Flood to S.E. 2¾ knots, and on the ebb is a race to the S.W.
Galley Head, 6 miles off	... ..	4 30 a.	Close inshore it slacks 1h. earlier.
Cape Clear, 6 miles off	... ..	4 50 a.	Flood sets S.E. by E. 1½ knot; a race close to the Cape; on the ebb or Western stream, there is a slack inside the line of Cape Clear and Mizen Head.
Off Mizen Head . . . . .	... ..	4 50 a.	Close to Mizen Head is a strong race of nearly 4 knots, S.S.E. and N.W. by N., and the stream turns 1½ to 2h. earlier.
Off the Bull, Cow and Calf	... ..	4 40 a.	Flood S.S.E. 1½ knot; Ebb, North; between these rocks and Dursery there are overfalls and strong currents.

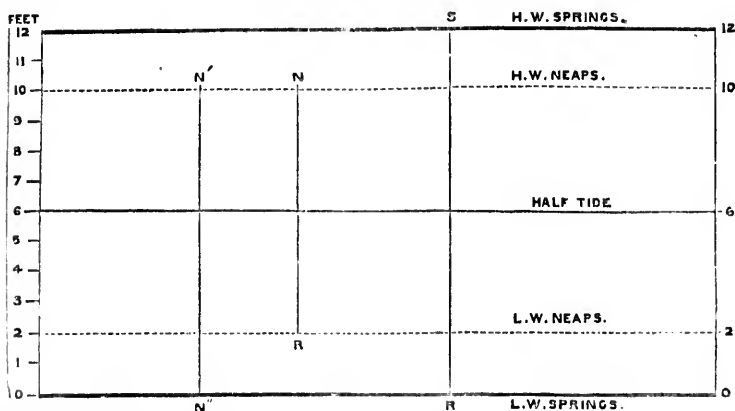
## IRELAND (WEST COAST).

PLACE.	Ending of the Flood Stream setting to the Northward.		REMARKS.
	LONDON.		
	H. M.	H. M.	
Off the Blaskets . . . . .	... ..	4 30 a.	Flood N. by E. 1½ knot; the flood wave divides about 3 miles South of the Skelligs, going Northward towards the Lemon Rock and Puffin Island, and Southward towards the Bull, Cow and Calf; stream varying from ½ to 1½ knot, it being strongest after a prevalence of Westerly winds, and very weak after Easterly winds.
Blasket Sound . . . . .	... ..	2 20 a.	Close inshore the stream makes out very shortly after H.W., or 2h. after H.W. London.
Shannon River entrance . . . . .	... ..	2 50 a.	Flood sets N.E. 1½ knot.
Seven miles off Kilkee . . . . .	... ..	5 0 a.	Flood N. by E. 2 knots; Ebb S.W. by S. 1½ knot.
Six miles off Arran Islands . . . . .	... ..	5 30 a.	Inshore near Slyne Head is a race of 3 knots.
Six miles off Slyne Head . . . . .	... ..	5 20 a.	Flood N.N.E. ½ E. 2 knots.
Off Inishbofin . . . . .	... ..	6 0 a.	Flood N.E. by N. 1 knot.
Off Achill Head . . . . .	... ..	6 0 a.	
Eagle Island . . . . .	... ..	6 0 a.	
Sligo Bay . . . . .	... ..	6 30 a.	Close inshore the Western tide makes soon after H.W., or 3¼h. after H.W. at London; but in the offing it sets E. by S. towards Donegal Bay until 6¼h. after H.W. at London.
Tory Island and Innistrathul, in the Offing	... ..	6 30 a.	Flood sets East 1 knot; Ebb, West; inshore the H.W. slack is 2h. earlier.

As a general rule, the stream in the offing on the N.W. Coast of Ireland runs to N.E., until 3 hours after High Water by the shore, and the inshore stream ceases very shortly after High Water.

Prevailing S.W. winds cause the flood stream to run longer and stronger, and they have the contrary effect on the ebb stream.

The following diagram is intended to illustrate the terms "Spring Rise," "Neap Rise," and "Neap Range," as they frequently occur on Charts and in Sailing Directions.



The Mean Level of High Water Ordinary Springs is represented by line . . . . .	12—12
" " " " Neaps " " " " " " " " . . . . .	10—10
Half Tide or Mean Level of Sea at both Springs and Neaps " " " " " " " " . . . . .	6—6
Mean Level of Low Water Ordinary Neaps " " " " " " " " . . . . .	2—2
" " " " Springs " " " " " " " " . . . . .	0—0

As shown by the diagram—

The <i>Spring Rise</i> (or Mean Spring Range) is represented by the line R to S, and is . . . . .	12 feet
The <i>Neap Rise</i> is represented by the line N'' to N', and is . . . . .	10 feet
The <i>Neap Range</i> is represented by the line R to N, and is (10—2) . . . . .	8 feet

Generally, it may be assumed that, from Low Water to High Water (Springs and Neaps), the water rises one-sixteenth ( $\frac{1}{16}$ ) of the range in the first hour; three-sixteenths ( $\frac{3}{16}$ ) of the range in the second hour; four-sixteenths ( $\frac{4}{16}$ ) of the range in the third hour; four-sixteenths ( $\frac{4}{16}$ ) in the fourth hour; three-sixteenths ( $\frac{3}{16}$ ) in the fifth hour; and one-sixteenth ( $\frac{1}{16}$ ) in the last hour. And it falls from H.W. to L.W. in the same ratio—viz.,  $\frac{1}{16}$ ,  $\frac{3}{16}$ ,  $\frac{4}{16}$ ,  $\frac{4}{16}$ ,  $\frac{3}{16}$ , and  $\frac{1}{16}$  in succession.

rs after  
ontrary

"Neap

# LIGHTS AND TIDES

OF THE

## WORLD.

### THE BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
BISHOP ROCK.	1 F.	Miles 16	Fect. 110	S. W. part Scilly Islands.	49 52.4	6 26.7	All round except where hidden by the Islands.	H. M.	Ft.
ST. AGNES.	1 Rev. ev. min.	17	138	Summit of Isl.	49 53.6	6 20.6	All round except where hidden by the Islands.	4 30	16
SEVEN STONES Light Vessel.	2 F.	10	20 & 38	E. side of rocks in 40 fathoms.	50 3.6	6 4.6	Gong. Gun.		
LONGSHIPS.	1 F.	14	85	On highest rock off Land's End.	50 4	5 44.7	N. by W. leads westward of the Runnel Stone.		
PENZANCE.	1 F.	9	33	S. pier-head.	50 7	5 31	Red for 15 ft. water, Green for less	4 30	16
WOLF.	1 <i>Rec 40 s.</i>	-	-	-	49 56.7	5 48.4	Building. <i>Red &amp; White</i>		
LIZARD.	2 F.	21	W 232 E 229	On the Cliff 74 yards apart.	49 57.7	5 12.1	In one, they clear the Manacles to E. and the Wolf to W.	5 0	14
Falmouth	1 Rev. ev. 20 s.	13	72	St. Anthony's.	50 8	5 1	-	4 57	16
..	1 F. <i>Green.</i>	-	-	On Breakwater.	-	-	-		
EDDYSTONE.	1 F.	13	72	On the Rock.	50 10.8	4 15.9	Bell proposed.		
Plymouth.	2 F.	9	63 & 48	On Breakwater, W. end.	50 20	4 9.4	Red seaward; White in the anchorage. White lt. below Red shows Channel open between Draystone and Knap buoys. Bell.	5 37	15
..	1 F. <i>Red.</i>	-	-	Mill Bay. End of Pier.	-	-	-		
..	1 F. Gas.	6	29	W. Barbican pier-head.	50 22	4 7	-		
START POINT.	1 F & Fl. ev. min	20	204	Near S. E. extreme of point.	50 13.3	3 38.5	Also a F. lt. in direction of Berry Head, seen only when Start Point bears between W. $\frac{1}{4}$ S. & S. W. by S. Bell intended.		
Dartmouth.	1 F.	11	85	Kingswear or N. side of harbour.	50 20.3	3 33.2	White over the fairway entrance to harbour, between N. $\frac{3}{4}$ W. & N. by W. $\frac{1}{4}$ W. Red over the shoals of Kettle Point and Castle Ledge. Green over the shoals of the Checkstone and Pin Rock.		
..	1 F.	-	70	On a flagstaff 110 ft. in advance.	-	-	In line with the former light N. $\frac{3}{4}$ W. leads in the fairway.	6 16	11
..	1 F.	-	-	S. part of town, near Coast Guard Station.	-	-	After passing between Castle and Kettle Points, a White light shows the fairway to the anchorage; a Red light the shoals on the N. side of harbour; a Green light the shoal on S. side.		

ter rises  
d hour;  
xtenths  
he same



## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
Brixham.	1 F. <i>Red.</i>	Miles 6	Feet. 20	On Pier-head	50 24	3 30				
Torquay.	1 F. <i>Red.</i>	5	15	Pier-head.	50 27.5	3 31		6 0	13½	
Teignmouth.	2 F. <i>Red.</i>	6	34	S.W. end of the Denn.	50 32.6	3 29.6	In one, to clear rocks off the Ness.	6 0	13	
Lyme Regis.	2 F. <i>Red.</i>	4	11 & 21	Inner Pier-head and Custom ho.	50 43.5	2 55.9	Half flood to half ebb.	6 21	11½	
PORTLAND.	2 F.	21	222	Near the Bill.	50 31.4	2 26.8	In one, lead between Race and Shambles Low lt. is visible only between E. S. E. and W. by S.			
		18	145		56 31.3	2 27.3				
"	1 F. <i>Red.</i>	9	30	On Breakwater.	- - -	- - -		7 1	6½	
SHAMBLES SHOAL Light Vessel.	1 F.	10	38	E. end of shoal in 15 fathoms.	- - -	- - -	Gong. Gun.			
Weymouth.	1 F. Gas. <i>Red.</i>	2	23	On Breakwater.	50 37	2 26				
CASQUETS.	3 Rev. ev. 20 s.	16	113 ea.	Eastn. Lightho.	49 43.3	2 22.7	Bell	6 45	15½	
Alderney.	2 F. Gas. <i>Red.</i>	5 to 9	55 & 25	Braye harbour, one on old Pier, the other on N. E. corner of Reading-room, 370 yds. apart.	49 43.3	2 12.1	The old Pier light is screened in direction of all dangers.	6 46	17½	
GUERNSEY.	1 F.	11	34	St. Peter Port-pier-head, S. side of entran.	49 27.2	2 32.1	When running in bring the light W. by N. ¼ N.; Light proposed on Castle Cornet pier head.	6 37	26	
"	1 Rev. ev. 45 s. <i>Red.</i>	12	100	S. W. rock of the Hanois Rocks	49 26.0	2 42.2				
JERSEY.	1 F.	7 to 10	60	Vereclüt Break-water, St. Catherine's Bay	49 13.3	2 1.2				
"	1 F.	-	55	Gouray Pier-hd.	- - -	- - -				
"	1 F.	6	31	Victoria or New South Pier	49 10.5	2 7.3				
"	1 F. <i>Red.</i>	3	15	Albert or North Pier	49 10.6	2 7.2	At ST. HELIER.	6 25	30½	
"	1 F. <i>Blue.</i>	3	17	Old N. Pier	49 10.5	2 7.3				
"	1 F. <i>Red.</i>	3	45	Upper Pier Road	- - -	- - -				
Swanage.	1 F.	-	-	On Pier	50 36.5	1 57	<i>Proposed.</i>			
Poole.	2 F.	6	37	N. side of entran. 262 yds. apart	50 41	1 56	In one N ¼ W. Also 4 F. lights inside.	9 10	6½	
ISLE OF WIGHT.	1 F.	w. lt. 14 red 9	80	Outer Needle Rock	50 39.7	1 35.4	<i>White</i> to clear Durlstone Head, Dolphin Bank, and S.W. tail of Shingles; also <i>White</i> bearing from S.W. by W. to S.W. by W. ¼ W. to clear Warden Ledge; on all other bearings <i>Red.</i> Fog-bell.	9 46	7½	
Hurst.	2 F.	13	76	On the Point, 252 yds. apart	50 42.4	1 32.9	In one N. E. by E. ¼ E. Another light shows up the Solent.	10 0	7	
Yarmouth.	2 F. Outer <i>Green.</i> Inner <i>White.</i>	-	12	30 yards apart	- - -	- - -	In one, lead into Harbour in 14 feet at H.W.	12 0	13	
Calshot Lt. Ves.	1 Rev. ev. min.	9	31	Off Calshot Cstl. in 3½ fathoms	50 48	1 16	Gong. Gun.	11 30	13	
Southampton.	2 F.	-	-	Royal Pier, 15 yards apart	50 54	1 24	In one, lead through the Channel; also two F. <i>Red</i> lights on the Duck Piers, which in one, lead up the River Itchen in 15 feet.	10 30	13	
								12 45		

Na  
LiRyde.  
Southse

WARNE

NAB Lig

ST. CAT  
Isle of  
OWERS ILittlehar  
Worthing  
Shorchan

Brighton.

Newhave

BEACHY I

Eastbourn  
Hastings.

Rye.

"

DUNGENE

VARNE

Light V

Folkeston

Dover.

"

"

"

LIGHTS AND TIDES.—BRITISH ISLANDS.

9.	1.	2.	3.	4.	5.	6.		7.	8.	9.
						Position.				
Rise of Springs.	Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
L. Ft.			Miles	Feet.		° N.	° W.		H. M.	Ft.
	Ryde.	1 F.	6	21	On the Pier	-	-	-	11 20	13½
0	Southsea.	1 F. <i>Red.</i>	9	51	In the Castle	50 47	1 5	Shows <i>Green</i> when to westward of the Spit-buoy.		
0	WARNER Lt. Ves.	1 Rev. ev. min.	8	38	E. part of shoal, in 13 fathoms	50 43·8	1 4	Gong. Gun.		
1	NAB Light Ves.	2 F.	8	Main 38 Fore 28	Off the Point nr. the Nab Rock, in 5½ fathoms.	50 42·2	0 59·5	Gong. Gun.	11 0	14
1	ST. CATHERINE, Isle of Wight	1 F.	19	178	On the Point	50 34·5	1 17·8			
	OWERS Lt. Ves.	1 F.	10	38	S.E. end of shoal in 19 fathoms.	50 38·8	0 40	Gong. Gun.		
	Littlehampton, Worthing.	1 F. <i>Red.</i>	7	30	N. end of E. pier	50 48	0 32		11 36	16
45	Shoreham.	1 F.	-	-	On the Pier	50 48·5	0 23			
46		2 F.	10	42	Opposite harbour's entran.	50 50	0 15	Low <i>White</i> light while 11 feet between piers, but a <i>Red</i> lt. at H.W. and slack tide. High lt. is shown all night.	11 34	18
	Brighton.	1 F. <i>Green.</i>	10	35	Chain Pier-head	50 49	0 8		11 15	19½
37	Newhaven.	2 F.	10	30 & 17	West Pier, 50 yards apart	50 47	0 3·4	Low light, <i>Red</i> for 10 to 13 feet on bar, but <i>White</i> above 13 ft.	11 51	20
	..	1 F. <i>Green.</i>	3	18	East Pier	-	-	To assist vessels entering between the piers.		
	BEACHY HEAD.	1 Rev. ev. 2 min.	23	285	Belletout Cliff	50 44·2	0 13	Kept open of next Eastern Cliff, clears Royal Sovereign & other shoals.	11 20	20
	Eastbourne.	1 F.	2	10	-	50 45	0 17	During the fishing season.		
	Hastings.	1 F. <i>White.</i>	7	60	Upper Light on the W. Hill above the town;	50 52	0 36	For the Fishermen.	10 53	24
		1 F. <i>Red.</i>	4	30	Lower on the Beach	-	-			
25	Rye.	2 F.	4	26	Camber; N. side of entrance	50 57	0 44	While 10 feet on the bar.	11 20	22
	..	2 Tide lts. <i>Red</i>	-	32	216 feet from Old Pier-head	-	-			
	..	<i>Green</i> light.	-	-	W. entrance to harbour	-	-	From half flood to half ebb.		
10	DUNGENESS.	1 F.	15	92	Extreme point	50 54·8	0 58·3	Fog-bell.	10 45	21½
45	VARNE Shoal Light Vessel.	1 Rev. ev. 20 s. <i>Red.</i>	10	38	Near W. end of shoal, in 16 fathoms	50 56·3	1 16·3			
46	Folkestone.	1 F.	6	36	S. Pier-head	51 4	1 11·6	Tide light, <i>Red</i> to 14 feet. <i>White</i> under <i>Red</i> above 16 feet.	11 7	20
	..	1 F. <i>Green.</i>	6	31	Extremity of New Pic.	-	-	<i>Green</i> in all directions seaward, <i>White</i> in shore.		
0	Dover.	1 F. <i>Blue.</i>	2	-	Cheeseman-head, outer extreme of W. Pier	-	-	A Bell.		
0	..	1 F. <i>Red.</i>	12	-	S. Pier	51 7	1 19	Tide light while 7 to 10 ft.	11 12	18½
30	..	2 F. <i>Red.</i>	-	-	S. Pier	-	-	Tide lights while 10 to 13 ft.		
	..	1 F. <i>Red.</i>	3	12	N. Pier	-	-	Tide light.		
30	..	1 F. <i>Green.</i>	-	-	Near Clock Twr.	-	-	Shows between the piers.		

## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
			Miles Feet.		N. E.		H. M.	Ft.	
SOUTHFORELAND	2 F.	26 23	372 275	On the Head, 443 yds. apart E. by S. & W. by N.	51 8.4	1 22.4	Lights in one, clear the S. end of Goodwin Sands. Off Folkstone stand off when high light dis- appears; but vessels drawing more than 14 feet should stand off when low light disappears.		
S. SAND HEAD Light Vessel.	1 F.	10	38	Off S. end of Goodwin Snd. in 13 fathoms	51 9.9	1 28.2	Gong. Gun.		
GULL STREAM Light Vessel.	1 Rev. ev. 20 s.	7	36	Near W. edge of Goodwin Snd. in 8 fathoms	51 16.5	1 30	Gong. Gun.		
N. SAND HEAD Light Vessel.	3 F. (triangular)	-	Fore 28 Main 42 Miz. 28	Off N. end of Goodwin Snd. in 9 fathoms	51 19.4	1 35.4	Gong. Gun.		
Ramsgate.	1 F.	6	37	W. Pier-head	51 19.7	1 25.4	Green Light; changed to Red while 10 feet water.	11 44	15
"	1 F. Green.	-	-	On W. Cliff	-	-	In one, with Red light on pier, leads through Cudd Channel.		
"	1 F. Green.	-	-	On E. Cliff.	-	-	In one, with Red lt., leads in the best water thro' Ramsgate Chan.		
NORTH FORE- LAND.	1 F.	19	184	On the Head	51 22.5	1 26.8	Shows a strip of Red light over the E. end of Margate Sand, when bearing S. by E. $\frac{1}{4}$ E. to S. $\frac{1}{4}$ W.		
RIVER THAMES, Margate.	1 F. Red.	10	85	W. end of Pier	51 24	1 23	There is also a Green Gas lt. on the end of Jarvis Jetty.	11 40	15 $\frac{1}{2}$
PRINCES CHAN. Light Vessels.	2 F. White. Red.	10	38	E. Tongue Sand in 10 fathoms	51 29	1 19	Gong. Gun.		
	1 Rev. ev. 20 s. Red.	10	38	N. side of Chan. between the Tongue and Girdler lts. in 3 $\frac{1}{4}$ fathoms	-	-	Gong. Gun.		
	1 Rev. ev. $\frac{1}{4}$ min.	10	38	W. Girdler Sand in 19 feet	51 29	1 7.2	Gong. Gun.		
NORF. Lt. Ves.	1 Rev. ev. $\frac{1}{4}$ min.	10	38	E. end of Sand, in 3 $\frac{1}{4}$ fathoms	51 29	0 48	Gong. Gun.	12 30	15 $\frac{1}{2}$
Sheerness.	1 F. Red.	5	32	Left Demi Bas- tion	51 26.8	0 44.7	Gaslight.	0 37	16
Sea Reach.	1 F. Red.	-	-	Southend Pier- head	-	-			
"	1 F.	11	40	Chapman Head	-	-	Changes to Red when it comes in one with the line of the E. Middle buoy, and to Northward. A Bell.		
"	1 F.	11	40	Mucking Flat	-	-	White, except towards the Sears and Chapman Head, towards the Oven Spit, and towards W. Blyth buoy, when it changes to Red.		
Hope Point.	1 F.	-	-	In the Fort	-	-	For Colliers only.		
Northfleet.	1 F.	-	-	India Arms whf.	-	-	White in fairway. Red over the anchorage in Gravesend Reach, and Broadness.	1 10	17 $\frac{1}{2}$
MOUSE Lt. Ves.	1 Rev. Fl. ev. 20 s. Green.	10	38	On W. end of Sand, in 4 fms.	51 32	1 0	Gong. Gun.		

Na  
Li

Maplin.

SWIN M  
Light  
GUNFLE

SUNK Lt

KENTISH  
Light  
GALLOPE  
Light  
HARWIC

CORK Lt

SHIPWAS  
Light  
ORFORDS

KESSING

LOWESTO

CORTON

St. Nic  
GAT L

YARMOU

COCKLE

LIGHTS AND TIDES—BRITISH ISLANDS.

M.	9. Rise of Springs. Ft.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility. Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs. Ft.
							Lat.	Long.			
							° N.	° E.			
		Maplin.	1 F. <i>Red.</i>	10	36	S.E. part of Sand	51 35	1 3	Not visible to Northward of line of the Maplin buoys. A <i>White</i> Lt. is also shown to indicate the Channel between Girdler Lt. and Shivering Sand buoy. Fog-bell.	H. M.	
		SWIN MIDDLE Light Vessel.	1 Rev. ev. min.	10	38	W. end of Sand, in 6 fathoms	51 39	1 7	Gong. Gun.		
		GUNFLEET.	1 Rev. ev. 30 s. <i>Red.</i>	10	41	S.E. part of Sand	51 45.8	1 20	Not to be approached nearer than a quarter of a mile, nor to pass Northward of the lighthouse. Fog-bell.	11 40	12
		SUNK Lt. Vessel.	1 F.	10	37	Fairway of E. Swin in 9½ fms.	51 49.5	1 31.1	Gong. Gun.		
		KENTISH KNOCK Light Vessel.	1 Rev. ev. min.	10	37	E. side of Sand, in 11 fathoms	51 40.8	1 40.5	Gong. Gun.	11 47	
44	15	GALLOPER Light Vessel.	2 F.	10	36	S.W. part of shoal, in 20 fms	51 45	1 56	Gong. Gun.		
		HARWICH.	2 F.	12 9	45 27	Extreme point, Dovercourt	51 55.9	1 16.9	High light visible when bearing from N. by E northerly, round by North to W. ½ N. Low light when bearing from N.W. ¾ W. to W.N.W. In one, bearing N.W. by W. ½ W. lead between Inner Ridge and Andrews buoys.	12 6	11½
40	15½	..	1 F.	5	10	Landguard Pt.	51 56.2	1 19	Shows <i>Red</i> outside and <i>White</i> within entrance; strip of <i>Red</i> strikes N. Shelf buoy bearing N. by W.		
		CORK Lt. Vessel.	1 Rev. ev. ¼ min.	10	38	Near Cork Ledge in 4½ fathoms	51 56	1 23	Gong. Gun.		
		SHIPWASH Light Vessel.	1 F.	10	38	Off N.E. end of Sand, in 9½ fms	52 1.5	1 38	Gong. Gun.		
		ORFORDNESS.	2 F.	14 13	83 63	On the Ness	52 5	1 34.5	In one, S. of the Ness, they lead through Hollesley Bay, close to N.W. edge of the Whiting and across outer edge of Cutler Sand; to the N. they lead inside the Knoll, the Ridge, and the Napes, and outside Sizewell Bank.	11 15	8
30	15½										
37	16										
		KESSINGLAND.	1 F. <i>Red.</i> Temporary.	-	-	Fish-houses	-	-	Indicates Pakefield Gateway.		
		LOWESTOFT.	2 F. <i>Red.</i>	-	-	On each Pier of Harbour	-	-	Also two <i>Green</i> Lights at entrance of inner Harbour.	9 57	6½
		..	2 F.	16 11	119 45	On the Cliff On the Beach	52 29.2	1 45.5	In one, N. ¼ E. and S. ¼ W.		
		CORTON Lt. Ves.	1 Rev. ev. 20 s. <i>Red.</i>	10	38	S.E. entrance of Gateway, in 15 fathoms	52 29.7	1 50	Gong. Gun.		
		St. NICHOLAS GAT Lt. Vcs.	2 F.	10 4	40 20	N. end of Kettle Bottom Sand, in 6 fathoms	52 35.5	1 47	<i>White</i> forward. <i>Red</i> aft. Gong. Gun.		
10	17½	YARMOUTH.	1 F. <i>Red.</i>	2	-	S. Pier at Gorleston	52 34.4	1 44.3	-	9 15	6
		COCKLE Lt. Ves.	1 Rev. ev. min.	10	36	N. entran., eastern side, in 6½ fathoms	52 41.5	1 47	Gong. Gun.		

## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at E. & C.		9. Rise of Springs
					Lat.	Long.		H.	M.	
WINTERTON.	1 F.	14	73	Near the Ness	52 43	1 41 5		7	50	
NEWARP Lt. Ves.	3 F. Triangular	10	Main 38 28	N. end of Sand, in 19 fathoms	52 45	1 53	Gong. Gun.			
HASBOROUGH.	2 F.	15	137 100	S.S.E. of Has- boro' Church	52 49	1 32	Leading lights through Hasboro' Gat, when in one N.W. $\frac{1}{2}$ W.			
Hasborough Light Vessel.	2 F.	10	38	N. end of Sand, in 15 fathoms	52 58	1 36	Gong. Gun.			
LEMAN & OWER Light Vessel.	2 (High Rev. ev. min. Low F.)	10	38 27	Between Leman & Ower Sands in 16 fathoms	53 8 8	2 1	Gong. Gun.	6	30	
CROMER.	1 Rev. ev. min.	23	274	Near the Cliff	52 56	1 19		7	0	14 $\frac{1}{2}$
HUNSTANTON.	1 F.	16	109	On the Point	52 56 9	0 29 8	Shows <i>Red</i> in direction of Roaring Middle Sand, when bearing be- tween E.S.E. and S.E. by E.			
Lynn Well Lt. V	1 Rev. ev. 20 s.	10	34	Off the Hook of Long Sand, in 17 $\frac{1}{2}$ fathoms	53 1	0 25 2	Gong. Gun.	6	0	23
DUDGEON Lt. V.	1 F.	10	38	Near the shoal, in 9 fathoms	53 15	0 56	Gong. Gun.			
OUTER DOWSING Light Vessel.	1 Rev. a <i>Red</i> face ev. 20 s.	10	38	W. side, in 9 fathoms	53 28 2	1 2 7				
HUMBER RIVER. SPURN Lt. Ves.	1 Rev. ev. $\frac{1}{4}$ min.	16	38	Off Point, in 9 fathoms	53 34	0 13	Gong. Gun.	5	26	18 $\frac{1}{2}$
SPURN.	2 F.	15 12	93	On the Point, 158 yards apart	53 34 7	0 7 2	N.W. $\frac{1}{2}$ N. and S.E. $\frac{1}{2}$ S.; Low lt. N.W. of High lt.			
Bull Sand Lt. V.	1 F.	10	-	S.E. end of Sand in 5 $\frac{1}{2}$ fathoms	53 34	0 5	Gong.			
Stallingborough. Killingholm.	1 F. 3 F.	- 11	- 68 35 37	At the Ferry S. Killingholm	53 37 53 39	0 10 0 12	WEST. Brightest when bearing W.S.W. High light in one with N. Lt. (S. by W.) leads clear of Holm Sand and Skitter Sand end. High lt. in one with low lt. (N.W.) leads up the Humber.	6	2	19 $\frac{1}{2}$
Paul.	1 F.	7	36	Near S.W. end of village	53 43	0 13				
Hebbles Lt. Ves.	1 F. <i>Red</i> .	5	16	S. side of Chan. in 5 fathoms	53 44	0 16				
Winteringham. Whitton.	2 F. 2 F.	- -	- -	On the fields Just above the ferry	- -	- -	S. shore. S. shore.			
Brough.	2 F.	-	-	-	-	-	<i>Proposed</i> .			
Bridlington. FLAMBOROUGH.	1 F. <i>Red</i> . 1 Rev. ev 2 min.	8 20	24 214	N. Pier-head On the Head	54 5 2 54 7	0 11 7 0 5	Shown while there is 9 ft. of water. Two faces <i>White</i> , one <i>Red</i> ; bearing N.N.E. clears N. end of Smithie shoal. Gun intended.	4 4	39 30	16 16
Scarborough.	1 F.	13	58	Vincent Pier	54 17	0 23	<i>Red</i> to seaward, <i>White</i> towards the Harbour. When 10 feet of water in Harbour.	4	11	15 $\frac{1}{2}$
WHITBY.	1 F. <i>Green</i> .	13	83	W. Pier-head	54 30	0 37	Two hours before, to two hours after H.W.	3	35	15
"	1 F.	10	54	E. Pier-head	-	-	<i>Red</i> to S., but <i>Green</i> to N. of the Rock Buoy.			

10. Name of Light
WHITBY.
TEES BAY BRAN SAND
GARE SAND SEATON.
HARTLEP
"
"
Seabam.
"
Sunderlan
FYEMOUTH
"
FYSE OR N SHIELDS
Blyth.
COQUET.
Warkwort FARN.
LONGTON
Berwick.
Eyemouth

LIGHTS AND TIDES.—BRITISH ISLANDS.

V. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
M. 50	Ft.	WHITBY.	2 F.	Miles 2	Feet. 240 each	On High Whitby near Ling Hill, 258 yds. apart	54 28	0 34.2	In one, S. by E. $\frac{3}{4}$ E and N. by W. $\frac{3}{4}$ W. ; S. lighthouse open E. of N. one clears Whitby Sear Rock. A Red light from N. Tower, in shore of and over the Sear Rock.	H.	M.	F.
		TEES BAY. Bran Sand.	2 F. <i>White, Red.</i>	11 10	53 38	W. part of Sand	54 38	1 13	In one, lead over bar. Light is changed as the bar shifts.			
30		Gare Sand Lt. V. Seaton.	1 F. <i>White, Red.</i>	7 13	20 89 34	N. Gare Sand Near Seaton Carew	54 38 54 40	1 13 1 12	There are other lts. up the Tees. In one, N.W. by W. and S.E. by E. they clear the Red Cars.			
0	143	HARTLEPOOL.	2 F. <i>White, Red.</i>	15 4	84 62	On the Heugh, in one tower	54 41.8	1 10.3	Red light shows only from half flood to half ebb.	3	28	15
0	23	"	1 F. <i>Red.</i>	7	37	Pier-head, Old Harbour	54 41	1 11	Also two small Red lights on the Quay, to guide vessels to entr. of Inner Harbour.			
		"	1 F. <i>Green.</i>	-	26	N. Pier-head, W Harbour	-	-	While there is 10 ft. water. Two Red Lights, 440 yds. N.W. $\frac{1}{2}$ N. from the Pier light, in one lead into the Harbour.			
		Seaham.	1 F. <i>Red.</i>	4	-	S. Pier-head	54 50	1 19	Tide lt. shows that vessels may run for Harbour.	3	24	14 $\frac{1}{2}$
		"	2	14 11	94 49	Red Acre Point (one tower)	-	-	High lt. F. <i>White</i> ; Low lt. <i>Red</i> , rev. every $\frac{1}{2}$ minute.			
26	187	Sunderland.	3 F.	13 10	73 58	N. Pier-head S. Pier-head	54 55	1 20	On N. Pier, one <i>White</i> , and 18 ft. below it one <i>Red</i> ; on S. Pier one <i>White</i> Tidal lt. from $\frac{1}{2}$ flood to $\frac{1}{2}$ ebb; <i>Green</i> lt. shows danger.	3	22	14 $\frac{1}{2}$
						Also on S. outlet Castle Yard	-	-	Tidal light.			
		TYNEMOUTH.	1 Rev. ev. min.	18	154	N. Pier Works	55 1	1 25	Vertically, <i>Green</i> at top, <i>White</i> in middle, <i>Red</i> at bottom.			
		"	3 F.									
		TYNE OR NORTH SHIELDS.	2 F.	16 13	123 77	Dockwray Sq. ; lowest nr. Cliff- ford Fort, 240 yards apart	55 0.5	1 26	Best Channel over Bar is lights in one bearing W. $\frac{3}{4}$ N.	3	23	13 $\frac{1}{2}$
		Blyth.	2 F.	11 7	48 26	S. end of the town. 148 yds. apart	55 7	1 30	In one, N. by W. $\frac{3}{4}$ W. and S. by E. $\frac{3}{4}$ E., shown while there is 8 ft of water.	3	15	15
		COQUET.	1 F.	14	83	S.W. pt. of isld.	55 20.1	1 32	Red strip towards Hauxley Point buoy. Red over Boulmer Rks.	3	0	14 $\frac{1}{2}$
		Warkworth. FARN.	1 F. <i>Red.</i> 2,—High, Rev. ev. $\frac{1}{2}$ m. Low F.	1 15 12	- 87 45	N. end of S. Pier Higher nr. S.W. of island, lower near N.W. pt. 187 yds. apart	55 21 55 37	1 35 1 39	While 10 feet on the bar. In one, N. by W. $\frac{1}{2}$ W. and S. by E. $\frac{1}{2}$ E. ; High lt. open rather less than its own height E. of Low light leads between Megstone and Oxscar. The lts. and Megstone in one, lead between Ploughseat and Goldstone. Low light is visible between bearings of S. and S. by E. $\frac{1}{2}$ E.			
39	16											
30	16											
11	15 $\frac{1}{2}$											
35	15	LONGSTONE.	1 Rev. ev. $\frac{1}{4}$ min.	14	75	On the Rock	55 39	1 37	In line with Farn high lt. leads over the Knavestone and close to S. of Whirl Rock.			
		Berwick.	2 F. <i>White, Red.</i>	11 8	48 28	Pier-head (one tower)	55 46	1 59	Low light while 10 feet on the bar.	2	18	15
		Eyemouth.	1 F. <i>Red.</i>	-	-	Corner of a house	55 52.4	2 5		2	15	15

## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
ST. ABBS.	1 F. Fl. ev. 10 s.	20	224	On the Head	55 55	2 8	From July to October.	2	8	14½
Dunbar.	1 F.	-	-	Old Harbour	56 0	2 30.7				
"	1 F.	-	-	Victoria Harbr.	-	-				
FIRTH OF FORTH INCHKEITH.	1 Rev. ev. min.	21	220	Summit of Isld.	56 2	3 8	All night except in clear moonlight <i>Green</i> under <i>White</i> for 8 ft. water. <i>Green</i> changes to <i>Red</i> when Dock Gate opens.	2	17	16½
Fisherrow.	1 F. <i>Red.</i>	5	20	Pier-head	55 56.9	3 4				
Leith.	1 F. <i>Red.</i>	8	22	E. Pier	55 59	3 10				
"	1 F.	10	28	W. Pier	-	-				
Newhaven.	1 F.	5	20	On the Pier	55 59	3 11	-	2	20	16
Granton.	1 F. <i>Red.</i>	6	33	On the Pier-hd.	55 59	3 15				
"	2 F. <i>Red.</i>	-	-	On outer Pier- heads	-	-				
Grangemouth.	1 F.	10	34	Entrance of Riv. Carron	-	-	Also a small <i>Red</i> light at New- halls, and a <i>White</i> one at Queens- ferry for use of passage boats.	2	24	16½
Inverkeithing.	2 F. <i>Red.</i>	-	-	W. Quay of Harb	-	-				
Burntisland.	1 F.	8	13	E. Pier	56 4	3 14				
"	1 F.	-	28	Ferry Pier	-	-				
Pettycur.	1 F.	-	-	On the Pier	-	-	<i>Red</i> to seaward; <i>White</i> when the Harbour is open.	-	-	-
Kirkcaldy.	1 F.	8	29	On E. Pier-head	56 7	3 9				
Buckhaven.	1 F.	9	17	On E. Pier-head	56 10.1	3 1.7				
St. Monance.	2 F.	-	20	<i>Red</i> on Pier-hd.; <i>White</i> on the side of a house	56 12.5	3 46.2	Sailing into Harbour, <i>Red</i> light on Pier must be kept slightly open to W. of <i>White</i> light.	-	-	-
Pittenweem.	2 F. <i>Red.</i>	6.	25	Pier-head	56 13	2 43.5				
"	1 F. <i>Red.</i>	6	72	S.W. angle of a disused Saw- mill	-	-	Do.; in bad weather a <i>White</i> lt. for 6 feet water.	-	-	-
Anstruther.	2 F. <i>Red.</i> <i>Green.</i>	4	16	W. Pier-head & Shore Light	56 13.3	2 41.9				
Cellardyke.	1 F. <i>Red.</i>	-	-	W. part of Har- bour	56 14	2 40	Only while boats are out.	-	-	-
ISLE OF MAY.	2 F.	21	240	Summit of Isle, N.E. side, 250 yards apart	56 11.1	2 33.4				
BELL ROCK.	1 Rev. ev. 2 min.	15	93	A sunken Reef	56 26.0	2 23.1	<i>White</i> and <i>Red</i> alternately. In fog a <i>Bell</i> every ½ minute.	-	-	-
St. Andrews.	1 F.	6	30	Pier-head	56 29	2 47				
"	1 F.	5	10	Turret in Cath- edral wall	-	-	In one N.N.W. W. and S.S.E. ¾ E. leading into the Tay. Leading up the Tay. A Bell.	2	6	16
BUDDONNESS or TAY.	2 F.	10	71	On the Ness, 374 yards apart	56 28	2 45				
Port-on-Craig.	2 F.	16	80	S. side of Ferry, 1700 yds. apart	56 27	2 49	N.N.E. and S.S.W.	-	-	-
Newport.	2 F.	11	29	On the W. Ferry Pier, 63 yards apart	56 26	2 37				
Dundee Harbour	2 F. <i>Red.</i>	7	10	Middle and E. Piers, 130 yds. apart	56 28	2 38	N.W. ¾ W. and S.E. ¾ E. in one, they lead clear to S.W. of Beacon Rock.	2	32	14½

LIGHTS AND TIDES.—BRITISH ISLANDS.

W. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W at P. & C.	9. Rise of Springs.
							Lat.	Long.			
M. S.	14½	Arbroath.	1 F. <i>Red.</i>	Miles -	Feet. 24	N. Pier	N. 56° 33'	W. 2° 35'	When vessels are about to enter. An occasional <i>bright flash</i> is a warning to keep off.	H. M. 1 35	Ft. 14
		Montrose.	2 F. <i>Red.</i>	10 11	61 35	N. side of entrance, 303 yds apart	56 42	2 27	In one, they lead into the river, clearing Annat Bank.	1 25	13
17	16½	Stonehaven.	2 F. <i>White. Red.</i>	-	18 24	Inner side of Harbour	56 58	2 12	W. by N. ¼ N. and E. by S. ¼ S.	1 10	14
		GIRDLENESS.	2 F.	20 16	185 115	On the Ness (one tower)	57 8·2	2 3			
		Aberdeen.	1 F.	8	40	N. Pier-head	57 8·3	2 3·9	From half flood till H. W.		
20	16	"	2 F.		47 30	Half a mile up Harbour on S. shore, 220 yds apart			<i>Red</i> lights when entrance is safe, <i>Green</i> otherwise. In one, they lead in.		
		BUCHANNESS.	1 Fl. ev. 5 s.	16	130	On the Ness	57 28·2	1 46·2			
24	16½	Peterhead.	1 F.	10	21	S. Harb., elbow of W. Pier	57 30	1 46	Vis. from S ¾ E. round Southerly to S. W. by W. ¼ W.	0 34	10½ 25½
		"	1 F. <i>Red.</i>	10	26	N. Harbour, W. Pier-head			Visible from N. E. ¼ N. to E. ¼ N		
		Fraserburgh.	2 F. <i>Red.</i>	5	36 Inner 18	Pier-head and Middle Pier, 76 yds. apart	57 41·5	2 0	From July to April, except moon-light nights.	0 40	11
		KINNAIRD HEAD	1 F.	15	120	On the Head	57 42	2 1	<i>Red</i> from N. N. W. ¼ W. to the shore, to cover Rattray Briggs.		
		Macduff.	1 F. <i>Red.</i>	6	25	W. Pier-head	57 40	2 30			
		Baird.	1 F.	8	28	N. Pier-head	57 40	2 31	Gas.	0 28	10½
		"	2 F. <i>White. Red.</i>	-	Highest lowest	Upper part of New Harbour, 20 yards apart	57 40·1	2 31·1	Not seen until the Harbour is open.		
		Elgin and Lossiemouth.	1 F. <i>Green.</i>		30	S. Pier-head					
		COYSELA SKERRIES.	1 Rev. ev. ind.	18	160	Craig Head	57 43·2	3 20·3	<i>Red</i> from N. W. by W. ¼ W. to the shore (Speymouth Bay).		
		CHANONRY.	1 F.	11	40	On the Point	57 34·5	4 5	Visible from E. ¼ S. to S. by W. by North and West.		
		CROMARTY.	1 F. <i>Red.</i>	9	50	On the Point at the Town	57 41	4 2		11 56	14
		TARGET NESS.	1 Int. vis. 2½ min dark ½ min.	15 to 18	175	On the Point	57 51	3 48	Westward of the Ness the light is always visible.		
		Little Ferry.	2 F.	4 3	19 14	On the Point, 50 yards apart	57 56	4 0	N. W. ¼ N. and S. E. ¼ S.		
6	16	Latheronwheel.	1 F.			S. Head	58 16·2	3 22·9	Only on dark nights towards end of fishing season.		
		Vick of Pulteney Town.	1 F. <i>Red.</i>	8	35	N. Pier-head	58 26	3 5	During July and August.	11 22	10
		NESS HEAD.	1 Rev. ev. ¼ min	20	175	On the Head	58 28·6	3 3·1	<i>White</i> to seaward, and <i>Red</i> towards Sinclair Bay.		
32	14½	PENTLAND SKERRIES.	2 F.	18 16	170 140	On the Island, 33 yds apart	58 41·4	2 55·4	N. N. E. and S. S. W.		





## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
DUNNET.	1 F.	23 Miles	346 Feet.	On the Head	58 40.3	3 22.3				
HOLBURN.	1 Fl. ev. 10 s.	13	75	On the Head W. side Thurso Bay	58 36.8	3 32.2	White towards Pentland Frith and Thurso Bay till it bears N.N.E. Red towards Scrabster Road.			
ORKNEY ISLANDS										
CANTICK.	1 Rev. ev. min.	16	116	On the Head, Hoy Island	58 47	3 7.7				
Hoy SOUND.	2 F.	10 7	115 55	High light on N.E. point of Gremsa Isl.; Low light on N.W. point, $\frac{1}{6}$ mile apart	58 56.1	3 16.5	In one, S.E. $\frac{1}{2}$ E. and N.W. $\frac{1}{2}$ W. High light, Red seaward; White between S.S.E. $\frac{1}{2}$ E. and W.S.W.; also shows towards Cava, N. $\frac{1}{2}$ W. to N.N.W. $\frac{1}{2}$ W. Low light White.			
Kirkwall.	1 F.	9	22	Pier-head	58 59.2	2 57.5	All night from August to April.	10	9	10
Auskerry.	1 Rev. Red.	-	-	On the Island	59 2	2 34	Proposed.			
START POINT.	1 F.	15	100	E. point of Sanday Island	59 16.6	2 22.4				
N. RONALDSHA.	1 Fl. ev 10 s.	18	140	On N. Point	59 23.2	2 23.6				
SHETLAND ISLDS.										
SUMBURGH HEAD	1 F.	21	300	On S.W. point of Shetlands	59 51	1 16				
Bressay.	1 Rev. ev. min. Red & White alternately.	15	105	E. side of en- trance to Ler- wick	60 6.2	1 7.5		10	30	6
WHALSEY SKERRIES.	1 Rev. ev. min.	18	145	Bound Skerry	60 25.4	0 44				
N. UNST.	1 F.	21	235	Muckle Flugga, N. part of Isl.	60 51.3	0 53	Red from N.W. by W. $\frac{1}{2}$ W. to the north shore of Unst. Rounding the Scaw of Unst keep the White light always in sight.			
CAPE WRATH.	1 Rev. ev. 2 min. Red & White alternately.	23	400	N.W. point of Scotland	58 37.5	4 59.7		7	30	15 $\frac{1}{2}$
SOUTH RONA.	1 Fl. ev. 12 s.	20	222	N.E. point of Island	57 34.7	5 57.6				
LOCH ALSH.										
KYLE AKIN.	1 F.	11	53	S.W. point, Gil- lean Island, W entrance	57 16.6	5 44.5				
ORNSAY ISLAND.	1 F.	12	58	On the Island, N.W. part of Sleat Sound	57 8.6	5 46.8				
HEBRIDES.										
BUTT OF LEWIS.	1 F.	19	170	N. point	58 30.7	6 16				
SPORNOWAY.	1 Rev. ev. $\frac{1}{2}$ min.	12	56	Arnish Point & Roek	58 11.5	6 22.2		6	46	13 $\frac{1}{2}$
Lewis Isle.	1 F.	1 $\frac{1}{2}$	27							
MONACH ISLANDS	1 Fl. ev. 10 s.	17	150	Shillay Island	57 31.6	7 41.6	Visible round the horizon.	5	44	12 $\frac{1}{2}$
"	1 F. Red.	12	62	(one tower)			Visible when bearing S.E. by S. round S. to S.W. by W.			
SCALPA ISLAND.	1 F.	17	130	E. point, Glass Island	57 51.4	6 38.5				
USHENISH, S. UIST.	1 F. Red.	15	176	E. side	57 17.9	7 11.5	Visible when bearing from S.W. to N. by E. $\frac{1}{2}$ E. by the North.			

LIGHTS AND TIDES.—BRITISH ISLANDS.

11

W. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Feet.		° N.	° W.		H. M.	Ft.
		BARRA HEAD.	1 Int. vis. 2½ min dark ½ min.	33	680	Highest pt. Barra Island; S. pt. of Hebrides	56 47.1	7 39.1			
		SKERRYVORE	1 Rev. ev. min.	18	150	On the Rock	56 19.4	7 6.5	W.S.W. from Tyree Is. distant 12 miles.		
		ARDNAMURCHAN	1 F.	18	180	On the Point	56 43.6	6 13.5	Vis. when bearing from S.W. by W. ¼ W. to N.E. by N. by the S.		
		SOUND OF MULL.	1 F.	12	55	Runa Gal Rock, 50 yards seaward of H.W. mark	56 38	6 4	Red Northward towards the sea; Green towards the New, Red, and Stirk Rocks; White towards Mull Sound.		
		LISMORE.	1 F.	15	103	Musdile Island	56 27.3	5 36.4	Obscured over the land Eastward from it.		
		CORRAN POINT.	1 F.	10	36	Loch Eil	56 43.3	5 14.5	Red Eastward between N.E. by E. ¼ E. and S.W. by W. White Westward wherever else visible		
9	10	Oban.	1 F.	-	-	On the Pier	56 25	5 31		5 22	12
		PLADDA OR PHILADDA IS.	1 F.	11	42	N. end Jura Sound	56 14.8	5 40.8	Red in direction of Bogha Nuadh Rock, White when bearing between S.S.W. ¾ W. and N.N.E. ¼ E.; masked between the bearings of N.N.E. ¼ E. and S. by W. ¼ W.; coming from S. a faint lt. may show E. of N.N.E. ¼ E.		
30	6	Orinan Canal.	1 F. Red.	4	25	E. Side	56 5.5	5 33		4 49	6½
		IRON ROCK, or SGIERMAOILE.				On the Rock	55 52.5	5 50	Building.		
		ISLAY SOUND.	1 F.	15	147	Rudha Mhail, N. pt. Islay I.	55 56.1	6 7.5	Shows Red from about S.S.W. ¼ W. Easterly to S. ¼ E.		
		"	1 F.	17	128	McArthur's Hd.	55 45.8	6 2.8	White up the sound, Red towards Jura.		
		RHYNNIS of ISLAY	1 Fl. ev. 5 s.	17	150	Oversay Island, off S.W. pt. of Islay	55 40.3	6 30.8	Vis. when bearing from S.S.W. ¾ W. to W. by N.		
30	15½	Port Ellen.	1 F. Red.	11	45	Carraig Fadda Point, W. ent. of Harbour	55 37.2	6 12.7	Greatest intensity is on the Channel Course or N. ¼ E. bearing.	5 0	5
		MULL of CANTYRE	1 F.	22	297	S.W. Headland of Cantyre	55 18.6	5 48	Visible from S.S.W. ¼ W. to N. by E. ¼ E. by the East.	10 35	4
		SANDA ISLAND.	1 F. Red.	15	165	Ship Rock	55 16.5	5 34.9	Kept in sight it clears Patterson Rock.		
		DAVAR ISLAND.	1 Rev. ev. ½ min	17	120	E. part	55 25.7	5 32.3	Vis. when bearing from N. ¼ W. to E. by S. by the N.		
		Campbelton.	1 F.	2	18	Old Pier-head	55 25.5	5 35.5	Red when bearing N. W.	11 45	8½
		Ardishaig.	1 F.	4	25	Pier-head	56 0.7	5 26.5		11 53	9
		PLADDA.	2 F.	17	130	On the Island off S.E. pt. of Arran Island	55 26	5 7.1	In one tower. Vis. when bearing from S.E. by E. (Northerly) to S.W. by W.		
				14	77						
46	13½	CLYDE RIVER.									
44	12½	CUMBRAE.	1 F.	15	115	W. side Little Cumbrae Is.	55 43.3	4 58		11 50	10
		TOWARD.	1 Rev. ev. 52 s.	10	70	On the Point	55 51.7	4 59.3			
		CLOCH.	1 F.	-	76	On the Point	55 56.6	4 52.6			
		GREENOCK.	2 F. Red.	-	40	One mile N.N. W. of Custom-house, 140 yds. apart	55 57	4 45	In one, bearing W.S.W. ¾ W. lead to the anchorage below the "Tail of the Bank."	9 8	9½

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
					Lat.	Long.		H.	M.	Ft.	
		Miles	Feet.		° N.	° W.					
GREENOCK.	1 F.	4	26	Quay in front of Custom-house							
Port Glasgow.	1 F.	3	18	On W. Quay	55 56.2	4 14	Also a small <i>Red</i> lt. shows the entrance of the Port.	0	18	9	
Cardross.	1 F. <i>Red.</i>	4	22	On Pillar Bank	-	-					
Bowling Bay.	1 F.	2	12	E. entrance of Bowling Harb.	-	-			0	39	9
"	1 F. <i>Red.</i>	-	26	Donald's Quay, 200 feet from the end	-	-	There are also 3 <i>White</i> lights between Port Glasgow and Bowling Bay, to be left to star- board going up the river.				
Broomielaw.	1 F.	-	-								
Ardrrossan.	1 F. <i>Red.</i>	5	25	End of Break- water	55 38.4	4 49.5			11	45	10
Saltecoats.	1 F.	6	26	On the arm of Pier	55 37.9	4 47.3	Also a <i>Red</i> light for the fairway.				
Troon Harbour.	1 Rev. ev. min. 40 s. bright, eclipsed 20 s.	9	35	Inner end of Pier	55 33	4 41	N. E. $\frac{1}{2}$ N. and S. W. $\frac{1}{2}$ S.		11	50	10
Ayr Harbour.	3 F. 1 <i>White</i> , 1 <i>Red</i> , 1 <i>Red</i> .	6	35	Pier-head							
		10	33	Beach, in one	55 28.3	4 38.4			11	50	8 $\frac{1}{2}$
		-	35	tower							
		4	12	N. Pier	-	-	Shown with 8 feet on the bar.				
Loch RYAN.	1 F.	10	46	Cairn Ryan Pt.	54 57.7	5 2	Leads to Anchorage in Loch.		11	12	11
CORSEWALL.	1 Rev. ev. 2 min <i>Red</i> & <i>White</i> alternately	15	112	On the Point, W. side entr. to Loch Ryan.	55 0.5	5 9.5	Visible when bearing from N. E. South-easterly to S. W. by W.				
Port Patrick.	1 F.	8	37	S. E. angle of Harbour, 130 yards within Outer Light- house which is not lighted	54 50.3	5 7			11	10	15
MILL OF GALLO- WAY.	1 Int. vis. 2 $\frac{1}{2}$ min dark $\frac{1}{2}$ min.	23	325	S. Point	54 38.1	4 51.3	Visible when bearing from S. W. to S. E. $\frac{1}{2}$ E.		11	15	15
LITTLE ROSS.	1 Fl. ev. 5 s.	18	175	On the Island	54 46	4 5	Visible from S. by W. to S. E. by E. (Northerly)				
Southernness.	1 F.	11	50	On the Point.	54 52.4	3 35.5			11	20	28
Annan River.	1 F.	-	-	Bankirk, or Annan Foot	54 57.7	3 16	From half flood to half ebb.		11	56	20
Port Carlisle.	1 F.	-	-	Pier-head	54 57	3 11	Tide light.		12	10	20
Skinburness or Cott.	1 F. <i>Red.</i>	9	40	Near Silloth.	54 52.5	3 23					
Lee Sear.	1 F.	6	25	On the Rocks	54 52	3 25	A Bell.				
Solway Lt. Ves.	1 F. <i>Red.</i>	6	25	Robin Rigg Chm. in 4 $\frac{1}{2}$ fathoms	54 48	3 32	A Bell.				
Maryport.	1 F.	12	51	Outer Pier	54 43	3 30.3			11	3	18
"	1 F.	12	-	Innerstone Pier	-	-	Shown while 8 ft. water.				
"	1 F. <i>Red.</i>	-	-	Jetty on S. side	-	-	On starboard side on entering, also the two others.				
"	1 F. <i>Green.</i>	-	-	N. Tongue	-	-	On Port Hand.				
Workington.	2 F.	11	53	Ends of John & Wooden Piers 110 yds. apart	54 39	3 35	While 8 ft. water.		11	4	20

1. Name Light
Harrington
Whitehaven
"
"
ST. BEES.
ISLE OF M AYRE.
Peel.
CALF OF J
Port St. J
Castletown
Derby Ha
"
DOUGLAS.
"
Ramsey.
Bahama Light
MORECAM WALSEY.
MORECAM
"
"
Lane Ri
Wyre R
Fleetwo
Ribble

LIGHTS AND TIDES—BRITISH ISLANDS.

N. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
M.	Ft.	Harrington.	1 F.	Miles 11	Feet. 44	Stone Pier-head	54 37	3 34	While 8 ft. water.	11 5	26	
18	9	Whitehaven.	1 Rev. ev 2 min.	11	47	W. Pier-head	54 33	3 36	} Indicate the outer entrance.	11 14	23½	
		"	1 F. <i>Green.</i>	-	-	N. Pier-head	-	-				
		"	1 F. <i>Red.</i>	-	-	Old Quay	-	-	While 9 ft. water in entrance.			
39	9	ST. BEES.	1 F.	25	333	On the Head	54 30.8	3 38				
		ISLE OF MAN. AVRE.	1 Rev. ev. 2 min. <i>Red &amp; White.</i>	15	106	½ mile S.W. of the Point	54 24.9	4 22	Visible from N. by E., round by West and South to E. by S.	11 7	20	
		Peel.	1 F.	8	21	E. side of entr.	54 13	4 42		11 8	16½	
		CALF OF MAN.	2 Rev. ev. 2 min.	24 22	375 282	W. side Calf I. 187 yds. apart.	54 3	4 50	N. E. ¼ E. and S. W. ¼ W. In one they lead on the Chicken Rock to the Southward.	11 17	16½	
45	10	Port St. Mary.	1 F.	9	25	Pier-head	54 4	4 44		11 10	20	
		Castletown.	1 F. <i>Red.</i>	8	32	New Pier-head	54 5	4 39		11 10	20	
50	10	Derby Haven.	1 F.	6	50	Fort Is. entran. of Harbour	54 5	4 36	Visible from N. by E. to S. by W. by the Westward.			
		"	1 F.	2	14	S.W. end of Breakwater	-	-				
50	8½	DOUGLAS.	1 F.	14	104	On the Head	54 9	4 28	Not visible from Lang Ness; but with 3 miles offing will be seen N. E. ¼ E.; the Calf It. at same time S. W. by W. ¼ W.	11 12	20½	
12	11	"	1 F.	6	34	N. Pier-head	54 10	4 28				
		Ramsey.	1 F. <i>Red.</i>	4	28	S. Pier-head	54 20	4 23		11 12	19½	
		Bahama Bank Light Vessel.	2 F.	10	F 20 M 33	One mile off S.E. tail of shoal, in 11 fathoms	54 20	4 12	Gong. Gun.			
10	15	MORECAMBE BAY WALNEY.	1 Rev. 1 F. <i>Red</i> (tidal)	13	70	S. part Walney Island	54 2.9	3 10.5	N. W. by W. ¼ W., and S. E. by E. ½ E. Also a <i>Red</i> light on the Railway Viaduct over the Leven estuary shows seaward.			
15	15	MORECAMBE BAY	1 Rev. ev. 30 s. <i>Red.</i>	10	38	Lt. Ves., in 12 fathoms	53 54	3 31				
		"	1 F.	8	48	Poulton, N. end of Stone Pier	54 4.3	2 52.5		11 26	27½	
20	28	"	1 F. <i>Red.</i>	5	30	Lt. Ves. between Yeoman and Clark Wharf Spits, in 4 fms.	54 1.3	3 0				
56	20	Lune River.	2 F.	-	54 20	Cookerham Prom. & Plover Scar Rock, 834 yards apart	53 59	2 53	Shown while 8 feet water.			
10	20	Wyre River	1 F.	10	30	N. E. elbow of N. Whf. Bank	53 57.2	3 1.8	A Bell.	11 11	27	
3	18	Fleetwood.	2 F.	13 9	90 30	In the Town On Esplanade	53 55.6	3 1	Shown while 9 ft. in the Channel.	11 12	26½	
		Ribble River.	1 Int. vis. 3½ min. eclipsed ½ min.	12	81	S E. of Stanner pt., N. side of entrance	53 44.6	3 1.3	Visible all round from the Blackpool to the Southport shores	10 51	24	
4	20	"	1 F.	-	-	Lytham	53 44.2	2 58.5	Not during summer.			

## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H. M.	Ft.	
Runcorn.	1 F.	Miles	Feet.	Bridgewater & old Quay Dks.	N.	W.	White light denotes a clear road; Green, no entrance; and Red, gates are closed.	H. M.	Ft.	
Woodside Ferry. GT. ORME HEAD.	1 F. 1 F.	- 24	- 325	N. pt, Steep Chill	53 20.6	3 52	White from S.E. by E. $\frac{1}{4}$ E. round by S. to West; Red from W. to W. $\frac{3}{4}$ N.			
ENTRANCE TO MERSEY & DEE FORMBY Lt. Ves.	1 F. Red.	9	30	Elbow of Crosby and Queen's Channels in 25 feet	53 31.7	3 10.8	A Bell.	10 35	28	
Crosby.	1 F.	12	95	Near Crosby pt	53 31.4	3 3.4				
Crosby Lt. Ves.	1 F.	8	29	N.E. elbow of Gt. Burbo Bank in 44 feet	53 30.7	3 6.9				
ROCK.	1 Rev. ev. min. (White & Red.)	14	61	On the Point, W side of entr. of the Mersey	53 26.7	3 2.4	A F. White Lt. shows down the Rock Channel and up the River while 11 feet water. Bell.	11 20	26	
LEASOWE.	1 F.	15	94	On the shore between the Mersey & Dee	53 24.8	3 7.4	Bell.			
BIDSTON. Hoylake.	1 F. 2 F.	23 11	228 55 31	Bidston Hill Near the Church	53 24 53 23.7	3 4.4 3 10.7	In one, S.W. by S. Approaching high light from W. it appears suddenly when bearing about S.S.E.; also low light when bearing about S.			
Liverpool N.W. Light Ship.	1 Rev. ev. min.	11	33	W. extreme of 3 and 4 fm. tongue; moor- ed in 6 $\frac{1}{2}$ fms.	53 29.5	3 20	Bell and Gong. Blue light every two hours.			
AIR.	1 F.	9	42	On the Point, L.W. mark.	-	-	White from N.W. to W., and from E. by S. $\frac{1}{4}$ S. to S. by E. Red within the Hoyle Sand.	10 54	25	
Menai. Beaumaris.	1 F. Red. 1 F. Red.	9 -	61 -	Trwyn-Du Pt On Pier	53 18.8	4 2.3		10 32	21 $\frac{1}{2}$	
LYNUS.	1 Flsh. vis. 8 s. obscured 2 s.	16	128	On the Point	53 25	4 17.3				
Amlwch Port	1 F.	9	26	N. Pier	53 25	4 20	Not shown when vessels cannot enter.	10 30	18	
SKERRIES.	1 F.	16	117	Highest Island	53 25.3	4 36.4	Also a Red light 50 feet lower, bearing between W. $\frac{3}{4}$ N. and W. by N. $\frac{1}{4}$ N., to cover Ethel and Coal Rock; dark towards East Platters Rock.			
Holyhead.	1 F.	11	44	Old Pier-head	53 20	4 37	And also a Red Lt. between S.W. and S.S.W. only, for clearing the Platters. A Bell and Signal Guns.	10 11	16	
"	1 F.	-	20	End of Wooden Jetty, old Har.	-	-				
"	1 F. Red.	4	40	New Brkwater.	-	-	Entering or leaving, keep $\frac{3}{4}$ cable eastward of light. A Gong.			
"	3 F. Green.	-	-	Upper edge of the Colfer Dam	-	-				

1. Name Light
STACK.
CARNARVON
"
BARDSEY.
Aberystwith
Cardigan Light V.
SOUTH BIS SMALLS.
BRISTOL C St. ANN'S.
Milford Ha CALDY.
Tenby. Saundersic Pembrey Burry P Llanelly.
HELVICK
MUMBLES. Swansea.
"
"
SCARWEA Light NASH.
Cardiff.

LIGHTS AND TIDES.—BRITISH ISLANDS.

V. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
M.	Ft.	STACK.	1 Rev. ev. 2 min.	20	201	S Staek Rock, off the N.W. pt. of Holy-head Island	53 18	4 42	In place of this a smaller lt. rev. in 1½ min., 40 feet high, is shown during foggy weather 30 yards N. of the main lightho. Bell.			
		Caernarvon.	1 F. Red.	5	50	Llanddwyn Is.	53 8	4 24.7				
		"	1 F.	-	-	On Pier-head	-	-		9 33	13½	
		BARDSEY.	1 W.	17	129	On the Island	52 45	4 48		7 40	15	
		Aberystwith	2 F.	-	-	Entrance of Harbour	52 25	4 5	Red to vessels coming from S. and W.; White to those coming from N.W. and N.E.	7 31	13½	
35	28	Cardigan Bay Light Vessel.	1 Rev. ev. 30 s. Red.	9	24	In 26 fathoms	52 22.5	4 54	Gong.	7 1	12	
		SOUTH BISHOP.	1 Rev. ev. 20 s.	18	144	On the Rock	51 51	5 25				
		SMALLS.	1 F.	15	115	On the Rock	51 43.3	5 40.1		6 0	21	
20	26	BRISTOL CHAN. ST. ANN'S.	2 F.	20 18	192 159	On Point, Milford Haven, 203 yds. apart	51 41	5 10.4	In one, they lead clear of Crow and Toes Rocks, outside the Crow and inside the Turbot Bank. A Red strip shows from high lighthouse over Chapel and Harbour Rocks, between N.W. ¼ N. and W. ¼ N.	5 56	24	
		Milford Haven.	2 F. Red.	3	-	Dockyard						
		CALDY.	1 F.	20	210	On Island, S. part	51 37.9	4 40.9		6 0	24	
		Tenby.	1 F. Red.	3	14	Pier-head	-	-	Only at Tide time.	6 0	27	
		Saundersfoot.	1 F. Red.	-	15	S. Pier-head	51 43	4 42	While 8 feet water.			
		Pembrey Har. Burry Port.	1 F.	9	35	Entrance Burry River	51 41	4 15	While 10 feet water.	6 1	25½	
		Llanelly.	1 F.	-	36	S. end of Break-water	51 40	4 10.4	From half flood until quarter ebb.	6 16	28	
54	25	"	1 F.	7	30	Whiteford pt.	-	-	From half flood until half ebb.			
		HELWICK LT. V.	1 Rev. ev. min.	10	38	Off W. end of Sand in 16½ fathoms	51 31	4 24	Gong. Gun.			
32	21½	MUMBLES.	1 F.	15	114	On the Island	51 34	3 58.2		6 1	27½	
		Swansea.	1 F. Red.	9	28	S. Dock W. Pier-head	51 37	3 56	While 8 ft. water between piers.			
30	18	"	2 F. Vertical.	-	-	S. Dock entr.	-	-	Shown when gates are open. Also two Red lights when passage is obstructed, and two Green lts. for passage clear.			
		"	2 F. Horizontal	-	-	N. Dock entr.	-	-	Shown when gates are open. Also two Red lights for passage obstructed, and two Green lights for passage clear.			
11	16	"	1 F.	-	-	New Cut Bridge	-	-	Red when bridge is closed, Green when open.			
		SCARWEATHER Light Vessel.	1 Rev. ev. 20 s. Red.	10	38	Western Edge in 15 fathoms	51 28	3 54				
		NASH.	2 F.	19 17	167 122	On the Point, 333 yds. apart	51 24	3 33	In one, S. E. by E. ¼ E. and N. W. by W. ¼ W., they lead a cable's length S. of the E. end of Nash Sand.	6 25	33	
		Cardiff.	1 F.	-	-	On the Pier	51 28	3 10	Building.	6 59	38	

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.	
					Lat.	Long.		H.	M.		Ft.
USK.	2 F. <i>White</i> <i>Red</i> .	11	39 29	W side entrance	51 32	3 0	Leads to Newport; there is also another <i>Red</i> lt. showing up the river.	7	10	38	
New Passage.	-	-	-	-	-	-	Several lights on Railway Pier and Charstone Rock.	-	-	-	
FLATHOLM.	1 F.	18	156	On the Island, S point	51 22.6	3 7	-	6	54	37	
ENGLISH AND WELSH GROUNDS Light Vessel.	1 Rev. ev. min.	10	38	S. side Pristol Chamel in 5 fathoms	51 26.5	2 58	Gong. Gun.	-	-	-	
AVON.	1 F.	13	73	E. side of entr.	51 30	2 42	Also a <i>Red</i> light to mark the entrance to Swatchway, bearing S.E. $\frac{1}{2}$ S.	-	-	-	
BRIDGEWATER, or Barnham.	2 Upper Int. vis. $3\frac{1}{2}$ min., obsc. $\frac{1}{2}$ min. Low lt. F	15	91	E. side entrance of River Parrett	51 15	3 0	In one, E. by S. $\frac{1}{4}$ S. and W. by N. $\frac{1}{4}$ N.	6	50	35	
Watchet Harbr.	1 F. Tide Lt.	3	24	W Pier	-	-	<i>Proposed</i> .	-	-	-	
Ilfracombe.	1 F. <i>Red</i> .	15	100	Lantern Hill, N. side of Harb.	51 13	4 7	From Michaelmas to Lady-day.	5	42	27	
Bideford.	2 F.	14	93	Braunton Sands, N. side of River	51 4	4 12	From half flood to half ebb; in one, S.E. $\frac{1}{4}$ S. lead over bar.	6	7	16	
LUNDY.	2—Upper Rev. ev. 2 m Low F.	31	540 470	On the ridge of the Island	51 10.1	4 40.2	The low lt. is only visible from the Westward, between S.S.E. and E.N.E. Gun <i>proposed</i> .	5	15	27	
TREVOSE HEAD.	2 F.	20 17	204 129	On N.W. part, Low lt. 50 ft. in advance of high one	50 32.9	5 2	-	5	0	-	
GODREVEY.	1 Flsh. ev. 10 s.	15	120	On the Island	50 14	5 24	Also a <i>Red</i> lt. 27 ft. below Fl. lt. to clear the Stones.	-	-	-	
Hayle.	2 F.	6	80 59	On Lelant Sand Hills	50 11.5	5 26	While 12 ft. water; and in one, lead into the Channel.	-	-	-	
St. Ives.	1 F.	7	23	On Pier-head	50 12	5 28	Shown while 10 ft. water, and only from 1st September to 30th April.	4	44	21	
IRELAND.											
FASTNET.	1 Rev. cv. 2 min.	18	148	On the summit of the rock	51 23.3	9 36.4	-	4	0	-	
KINSALE.	1 F.	21	236	On the S. pt., Old Head	51 36.2	8 32	<i>White</i> to seaward, <i>Red</i> towards Horse Rock in Courtmacsherry Bay.	4	43	11 $\frac{1}{2}$	
"	1 F.	14	98	Fort Charles, E. side of Harb.	51 41.8	8 29.8	-	-	-	-	
CORK HARBOUR, or QUEENSTOWN	1 Rev. ev. min. <i>Red</i> .	8	98	Roche Pt., E. side of entr.	51 47.5	8 15.2	<i>White</i> towards Harbour, and a <i>White</i> F. lt. to cover Daunt's Rock. A Fog-bell.	-	-	-	
"	1 F. <i>Red</i> .	5	32	E. Elbow of Spit Bank in 9 feet (on screw piles)	51 50.7	8 16.4	Visible from N.N.E. $\frac{1}{4}$ E. to S.E. by E. $\frac{1}{4}$ E. round by the Eastward.	5	1	11 $\frac{1}{2}$	
"	1 F. <i>Bright Red</i>	3	21	Lough Mahon, off Meelough Bank, 100 ft. from Channel	-	-	-	-	-	-	
"	1 F. <i>Green</i> .	-	-	S.E. of Black Rock Castle, 7 cables	-	-	-	-	-	-	

1  
Name  
Ligh

BALLYCOO  
Youghal  
MINEHEA  
Dungarva

WATERFO  
"  
"  
SAUTEES L.  
TUSKAR.  
BLACKWA  
BANK L.  
ARKLOW L.  
WICKLOW  
SWASH.  
WICKLOW  
DUBLIN B.  
KISH Lt.  
Kingston  
POOLBEG.  
BAILEY.  
Howth.  
Balbrigg

LIGHTS AND TIDES.—BRITISH ISLANDS.

V. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
M.	Ft.			Miles	Feet.		° N.	° W.		H.	M.	Ft.
10	38	BALLYCOTTIN.	1 Fl. ev. 10 s.	18	195	On outer Island	51 49.5	7 59	Seen from W. $\frac{1}{4}$ S. round North to E. $\frac{1}{4}$ S. A Fog-bell.	4	54	12
		Youghal.	1 F.	6	78	W. side of entr.	51 56.6	7 50.6	Open seaward to S.W. by S.	5	14	12 $\frac{1}{2}$
		MINEHEAD.	1 Int., bright 50 s. dark 10 s.	21	285	S. side of Head	51 59.6	7 35.2	Visible from E. by N. $\frac{1}{4}$ N. to W. $\frac{3}{4}$ S.			
54	37	Dungarvan.	1 F.	10	52	Ballinacourty pt., N. entr.	52 4.4	7 33.1	Green in the direction of the rocks, extending from Ballinacourty pt. Red in the direction of Carrickapane Rock. In all other directions White.	5	12	12 $\frac{1}{2}$
		WATERFORD.	1 F.	16	152	Hook Tower, E. side of entr.	52 7.4	6 55.9	Fog-bells.			
		"	1 F. Red.	5	44	Dunmore Pier- head, W. side of entrance	52 9	6 59.5	To N. of the Pier White.			
50	35	"	2 F. Vertical.	10	53	Duncannon Fort E. side of Chan.	52 13.2	6 56	Lower light tidal.	5	20	12 $\frac{1}{2}$
42	27	"	1 F.	16	128	Duncannon N., $\frac{1}{4}$ mile N.N.E. $\frac{1}{4}$ E. of the Fort	-	-	In one with light in Duncannon Fort leads over bar.			
7	16	SALTERS Lt. Ves.	2 F.	10	M 38 F 23	Off Coningbeg Rock in 32 fms	52 2.4	6 40	Gong.	5	40	
15	27	TUSKAR.	1 Rev. ev. 2 min.	15	101	On the Rock	52 12.1	6 12.3	Two faces White, one Red. Red light visible every 6th minute, seen 10 miles. Fog-bell.			
0		BLACKWATER BANK Lt. Ves.	1 F.	9	M 33	N.E. part, in 19 fathoms	52 29.5	6 7	Gong.			
		ARKLOW Lt. Ves.	1 Rev. ev. $\frac{1}{4}$ min.	10	M 39	S. end of Bank in 22 fathoms	52 42	6 0	Gong.			
		WICKLOW SWASH.	1 F. Red.	9	38	S.E. by E. $\frac{1}{4}$ E., 8 miles from Wicklow Head in 12 fathoms	52 57.7	5 47				
44	21	WICKLOW.	1 F.	16	121	On the Head	52 57.8	6 0.1		10	29	9
0		DUBLIN BAY. KISH Lt. Ves.	1 Rev. ev. min.	10	36	Off N. pt. of Kish Bank, in 10 fathoms	53 19	5 56.3	Gong. Gun.			
43	11 $\frac{1}{2}$	Kingstown.	1 Rev. ev. $\frac{1}{4}$ min. Red & White	9	41	Centre of E. Pier-head	53 18	6 8	Not visible from S. until it bears N.W. $\frac{1}{4}$ N., which clears the Muglin Rocks. Fog-bell.			
		"	1 F. Red.	2	36	W. Pier-head	-	-				
		POOLBEG.	2 F.	12	68	End of S. Wall, entrance to R. Liffey (1 Tower)	53 20.5	6 9.3	Low light much fainter than the Upper, and only shown from half flood to half ebb. Fog-bell.	11	12	13
1	11 $\frac{1}{2}$	"	1 F.	10	29	Near E. extreme of N. Wall	53 21	6 14	A ray of Red shows to the S. of the lt. across the River			
		"	1 F.	-	-	-	-	-				
		BAILEY.	1 F.	15	134	S.E. pt., Howth Peninsula	53 21.7	6 3.3	Fog-bell.			
		Howth.	1 F. Red.	11	43	E. Pier-head	53 24	6 4		11	9	13
		Balbriggan.	1 F.	10	42	Pier, S. side of entrance	53 36.7	6 11		10	40	11



## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
ROCKABILL.	1 Fl. ev. 12 s.	Miles 18	Feet. 148	On the summit of the larger Rock	N. 53 35.7	W. 6 0.5	White flash between N. $\frac{1}{2}$ W. and S.W. by S., and Red between same bearings towards the land	H. M.	Ft.
Drogheda.	3 F.	6 to 7	27 40 23	Sand hills, S. side River Boyne.	53 43	6 15	The E. and W. lights in one lead over the bar; and when the N. light opens, steer for it.	11 0	11 $\frac{1}{2}$
Dundalk.	1 Fl. ev. 15 s.	9	33	Entr. of Chan.	53 58.7	6 18		10 50	13 $\frac{1}{2}$
„	2 F.	-	-	-	-	-	Also 8 beacon lights from the Bar to the Quay.		
CARLINGFORD.	2 F.	15	104	Haulbowline Rock (1 tower)	54 1	6 5	Lower lt. from half flood to half ebb. Fog-bell.	11 10	14
„	1 Rev. ev. 45 s.	9	29	Greenore Pt.	54 1.9	6 7.9			
DUNDRUM BAY.	1 Int. Red 45 s. Dark 15 s.	12	62	St. John's Pt.	54 13.2	5 40			
Ardglass.	1 F. Red.	6	18	Head of Harb.	54 15.2	5 36.8		11 0	16
SOUTH ROCK.	1 Rev. ev. 1 $\frac{1}{2}$ min	12	52	On the Rock	54 23.9	5 25.1	Fog-bell.	10 58	13
Donaghadee Harbour.	1 F.	12	56	S. E. Pier-head	54 38.7	5 32	Red seaward, White towards the Harbour and entrance of Belfast Bay.		
COPELAND.	1 F.	16	131	Small Copeland Island	54 41.7	5 32	Fog-bell.		
Belfast Bay.	1 F. Red.	5	27	Hollywood Bank	54 39	5 53	Also a Green light on Hollywood Bank, and 3 more Green lights towards Belfast—to be left on port side in going up. Also a Red lt. 13 feet high S.W. of the Stone Beacon—to be left on starboard side.	10 43	9 $\frac{1}{2}$
Larne Lough.	1 F.	11	42	Farres Pt.	54 51	5 48		10 48	6 $\frac{3}{4}$
MAIDENS.	2 F.	14 13	E. 95 W. 82	On the Rocks, 800 yds. apart	54 55.8	5 44.3	N.W. by W. and S.E. by E. Fog-bell.	10 43	6 $\frac{3}{4}$
RATHLIN.	2—Upper, Int. Bright 50 s. Dark 10 s. Lower, F.	21	243 182	Altacorry Head, N.E. point of Island	55 18.2	6 10.7	F. lt. not visible to W. of island, and within 10 miles appears as a separate lt. Also a Red lt. towards Carrickvannan Rock. Fog-bell proposed.		
LOUGH FOYLE.	-	-	-	-	-	-	The following 11 lts. only shown from October to May.		
INISHOWEN.	2 F.	13 each.	67 each.	Dunagree Pt., E. and W. 153 yards	55 13.6	6 55.6			
Warren Point.	1 F. Red.	-	30	On the Point	-	-	Visible from E. by N. to W. $\frac{1}{2}$ S.	6 20	6 $\frac{1}{2}$
Near Red Castle.	1 F.	-	25	Outer edge of Ridge shoal	-	-			
White Castle.	1 F.	-	26	E. side of Chan.	-	-			
Ture.	1 F.	-	25	On the flats, S.E. side of Chan.	-	-			
Cunnyberry.	1 F.	-	25	Flats, N.W. side of Channel	-	-			
Culmore.	1 F.	-	45	On the Point	-	-			
Culkeeragh.	1 F.	-	50	E. side of entr.	-	-			
Booni Hall.	1 F. Red.	-	12	-	-	-			
Rosse Bay Lt. V.	1 F.	-	20	-	-	-			
Near Rock Mill.	1 F. Red.	-	15	-	-	-			
INNISTRALHUL.	1 Rev. ev. 2 min.	18	181	N.E. part of I.	55 25.9	7 13.6			

1.  
Name of LightLOUGH SW  
TORY ISL

ARAUNMORE

RATHLIN-  
BIRNE.  
KILLBEG

SLIGO.

Broadhav

EAGLE.

BLACK RO

Blacksod

Clew Bay  
CLARE IS  
INISHGOR

SLYNE H

GALWAY  
EERAGH  
INISHEER

Mutton I

River Sh  
LOOP HE

KILCRAD

Tarbert.

LIGHTS AND TIDES.—BRITISH ISLANDS.

W. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		
							Lat.	Long.		H.	M.	Ft.
M.	Ft.	LOUGH SWILLY.	1 F. <i>Red</i> .	Miles 14	Fect. 91	Fanad Point	53 16.5	7 37.9	Towards the Lough <i>White</i> . To vessels passing S.E. of the Island it is not visible between N.W. by N. and N.W. $\frac{1}{2}$ W.	H.	M.	Ft.
0	11 $\frac{1}{2}$	TORY ISLAND.	1 F.	16	130	N.W. Point	55 16.4	8 15		5	16	11 $\frac{1}{2}$
56	13 $\frac{1}{2}$	Aranmore Island	1 Flsh. ev. 20 s.	18	233	N.W. Point	55 0.9	8 33.8	<i>White</i> seaward; <i>Red</i> when bearing between S.W. by W. $\frac{3}{4}$ W. and W. $\frac{3}{4}$ S.			
10	14	RATHLIN-O-BIRNE.	1 F.	16	116	On the Island	54 39.8	8 49.9	<i>Red</i> towards the mainland, and Sound eastward of island.			
		KILLYBEGS.	1 F.	14	98	St. John's Pt.	54 34.1	8 27.5		5	16	11 $\frac{1}{2}$
		"	1 F.	12	66	Rotten Island	54 36.8	8 26.4				
		SLIGO.	1 F.	13	79	Black Rock	54 18	8 37				
0	16	"	2 F.	11	40	Oyster Island,	54 18.1	8 34.1	After passing the Bar, lights in one clear the Bun Gar Bank, and lead to entrance of Harbour, or up to Metal Man Beacon.	5	23	11 $\frac{1}{2}$
58	13				49	165 yds. apart	N. Lt.					
		Broadhaven.	1 F.	12	87	Gubacashel Pt., W. side, entr.	54 16	9 53	<i>White</i> seaward and towards E. side of Haven; <i>Red</i> when seen from W. side of Harbour.	5	0	10 $\frac{1}{2}$
43	9 $\frac{1}{2}$	EAGLE.	2 F.	20	220	Eagle Rock, E. by N. and W. by S., 132 yds.	54 17	10 5.5	In one, they lead clear of all dangers between Blacksod Bay and Broadhaven, and also the Stags.			
		BLACK ROCK.	1 Rev. ev. $\frac{1}{2}$ min	22	283	Western extreme	54 4.2	10 19.3	<i>White</i> seaward and <i>Red</i> towards the land from N.E. by E. $\frac{1}{4}$ E. round E. to S.E. by E. $\frac{1}{4}$ E.			
48	6 $\frac{3}{4}$	Blacksod Pt.	1 F.	-	-	Blacksod Bay.	54 6	10 3.5	<i>Building</i> . Lighted, probably, end of 1865. <i>White</i> from S.W. round E. to N.E. by E.; <i>Red</i> from N.E. by E. to N.E. $\frac{3}{4}$ E.	4	47	10
43	6 $\frac{1}{2}$											
		Clew Bay.										
		CLARE ISLAND.	1 F.	27	341	N. pt. of Island	53 49.5	9 59.5		4	38	12 $\frac{1}{2}$
		INISHGORT.	1 F.	10	36	On the Island, entrance to Westport.	53 49.6	9 40.2				
		SLYNE HEAD.	1 Rev. ev. 2 min.	15	126	Outermost Isl. off the Head, S. $\frac{3}{4}$ W. and N. $\frac{3}{4}$ E., 142 yds.	53 24	10 14	Lights in one, lead outside of all the Rocks between Galway and Clew Bays. N., or Rev. light, has one <i>Red</i> and two <i>White</i> faces.	4	30	13 $\frac{1}{2}$
			1 F.	14	115							
20	6 $\frac{1}{2}$	GALWAY BAY.										
		EERAGH ISLAND.	1 Rev. ev. 3 min.	16	115	W. Point	53 8.9	9 51.5	A strip of <i>Red</i> light in direction of Finnis Rock.	4	35	14 $\frac{1}{2}$
		INISHEER.	1 F.	15	110	S. Point	53 2.7	9 31.5		4	20	13 $\frac{3}{4}$
		Mutton Island.	1 F.	10	33	Centre of Island, off Galway	53 15.2	9 3.2				
		River Shannon.										
		LOOP HEAD.	1 F.	22	277	Near extreme of Head	52 33.6	9 55.9	Visible when bearing between S. W. by W. $\frac{1}{4}$ W., and N.W. by W.			
		KILCRADAN.	1 F.	16	133	On the Point	52 34.8	9 42.6	<i>Red</i> seaward. <i>White</i> towards the River.	4	57	14 $\frac{1}{2}$
		Tarbert.	1 F.	13	58	On the Rock	52 35.5	9 21.8				

## LIGHTS AND TIDES.—BRITISH ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
Beeves.	1 F.	Miles 10 to 12	Fect. 40	S.W. side of Rock.	52 39	9 13	White from E. $\frac{1}{2}$ N. to N.W. by W., or 140° Red to the N. of Rock.			
Tralee.	1 F.	5	56	Little Sapphire Island	52 16.2	9 52.9	White from E. by S. $\frac{3}{4}$ S. to W.N.W. Red seaward from W.N.W. to N. $\frac{1}{4}$ E.	4	3	12 $\frac{1}{2}$
Tearaght.	1	-	-	On the Island	52 4.5	10 40	Building.			
VALENTIA.	1 F.	12	54	Cromwell's Fort	51 56	10 19.3	-	3	42	11
SKELLIS.	2 F.	25 18	372 175	Highest Rock $7\frac{1}{2}$ miles off shore, 240 yds. apart	51 46.2	10 32.7	When Calf Rock is lighted, the high light will be extinguished.			
Calf Rock.	1 Fl.	-	-	On the Rock	51 34.2	10 15	Building. May be lighted end of 1865.			
BANTRY BAY.	1 F.	12	55	E. entrance on Roanearrag L.	51 39.2	9 44.8	Visible from W. by N. round Southerly to S.E. by E. $\frac{1}{2}$ E.	3	47	10
Crookhaven.	1 F.	13	67	Rock Island, N. pt. of entrance	51 28.6	9 42.6	Red across Alderman Rocks to Streak Head, from N.W. $\frac{1}{4}$ W. round S. to North.	4	9	9 $\frac{3}{4}$

1.  
Name  
Light

Newport.

" Ostend.

"

"

"

Blanken  
Heyst.Paarde  
LightNORTH H  
LightWEST H  
LightFLUSHING  
VLISSCH  
WESTCA

Veere.

Sloe.

SCHOUW

VERKLE

# THE NORTH SEA.—E. SIDE.

## COAST OF BELGIUM.

M.	Ft.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
								Lat.	Long.			
			Nieuport.	1 F.	Miles 6	Feet. 32	W. side of Port	51 8.4	2 43.7	While 12 feet water.	H. M. 12 18	Ft. 16
			"	1 F. <i>Red.</i>	14	96	One mile inland	51 8.3	2 43.7			
47	10		Ostend.	1 F. <i>Green.</i>	7	25	W. Pier-head	-	-		12 25	19
			"	1 F.	20	189	N. E. corner of Town	51 14.4	2 55.9	Visible from E. $\frac{1}{2}$ N. to S. W. $\frac{1}{2}$ S. round North.		
9	9 $\frac{1}{2}$		"	1 F. <i>Red.</i>	5	25	Extreme of E. Pier	-	-	When 9 feet water on bar, extin- guished when 16 ft. No vessel must attempt the harbour unless this light is shown		
			"	1 F.	7	40	On Battery, 100 yards inside of E. Pier end	-	-	When 16 feet water on bar; also a second light below this for 19 ft.; this light in line with <i>green</i> light shows the entrance.		
			Blankenberg.	1 F.	6	44	In a small fort	51 18.9	3 8		12 48	13
			Heyst.	1 F.	7	48	On Sand Hills, N. of Town	51 20.4	3 14			
			Paarde Markt Light Vessel.	1 F. <i>Red.</i>	7	33	Near S. W. part of Bank in 7 fathoms	51 24.2	3 20.5	In the Weilingen Channel.		
			NORTH HINDER Light Vessel.	1 F.	11	40	E. side of Bank in 14 fathoms	51 36.7	2 34.6	Bell and Gong. Pass N. of <i>Red</i> buoy, moored in 12 fathoms, at 2 miles N. $\frac{1}{4}$ E. from light.		
			WEST HINDER Light Vessel.	1 Rev. ev. $\frac{1}{4}$ min	12	40	Near S. W. part of Bank in 17 fathoms	51 22	2 26.4	Twice <i>White</i> and once <i>Red.</i>		

## COAST OF HOLLAND OR NETHERLANDS.

			FLUSHING OR VLISSINGEN.	1 F.	10	49	Westhaven Bastion	51 26.4	3 34.7		1 20	15
			WESTCAPPEL.	1 F.	20	144	Old Church Tower	51 31.8	3 27			
			Veere.	1 F.	10	38	Kampveer tower S. side of entrance	51 32.9	3 40.5		1 20	15
			Sloe.	1 F.	3	33	On the Dyke S. of Middelburg Harbour	51 31.7	3 41.1	Visible in Sloe Sand Creek, and entrance to Veere.		
			SCHOUWEN.	1 Rev. ev. $1\frac{1}{2}$ min	20	171	N. W. end of Island	51 42.5	3 41.7	Visible 25 s., greatest brilliancy 10 s.		
			VERKLIKKER.	1 F.	5	56	N. W. part of Island	51 43.5	3 43	Shows the anchorage by night.		

## LIGHTS AND TIDES.—HOLLAND.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
RENESE OR BROUWERS- HAVEN GAT.	2 F.	Miles 12 to 16	Feet. 115 148	N. side of Island 800 yds. apart	51 44.5	3 47.3	In one, lead into Brouwers- haven Gat.	2	15	10
Ossenhoek.	1 F.	10	22	End of Pier, W. from Brou- wershaven Rd.	51 44.7	3 53.5				
Steenen Baak.	1 F.	10	85	Beacon on N. side of Island	51 49.9	3 55.6	Seen from Westward it is <i>Red</i> ; a guide for the North Pampus.			
GOEDEREDE OR GOEREE.	1 F.	18	148	On Church Tower	51 49.1	3 58.8	It shows <i>dark Red</i> in the direction for navigating the North Pampus			
Kwade Hoek.	1 F.	5	115	On Sand Hills, N. E. of Goeree	51 50.2	4 0	When in one with Goeree Coast light, bearing S. W. by W. $\frac{1}{4}$ W., a vessel has reached the middle of the North Pampus.			
Middelharnis.	1 F.	-	-	-	51 46.7	4 12				
Hellevoetsluis.	1 F.	8	49	On a Tower, W. end of Harb.	51 49.2	4 7.9		2	30	8
Oostvoorne.	2 F.	7 8	39 59	On Sand Hills, W. by N. $\frac{1}{4}$ N. a mile from village, 457 yds. apart	51 54.8	4 4.5	From the W. the N. lt. appears <i>Red</i> but <i>White</i> when it bears N. E. by E.; a vessel will be then in the Bank Channel. The S. lt. is visible from S. and E. by S., round by the West.			
Houten Baak.	1 F. <i>Red.</i>	4	-	-	51 55.6	4 8.2				
Molenhaven.	2 F. <i>Red.</i>	4 ea.	-	N. side of entr.	51 55	4 10.3	In one, a mark for N. part of the Bank Channel.			
Brielle Harbour.	1 F.	4	16	E. Mole	51 54.5	4 10.9		3	0	5
SCHEVENINGEN.	1 F.	16	95	On Sand Hills, S. of village	52 6.3	4 16.3				
Katwijk-aan-Zee	1 F.	6	82	On Sand Hills, S. of village	52 12	4 23.7	Shown when fishing boats are out.	2	30	5
Noordwijk-aan- Zee.	1 F.	5	66	On Sand Hills, N. E. of village	52 14.6	4 25.9				
Zandvoort.	1 F.	4	56	On Sand Hills, N. W. of village	52 22.5	4 31.9				
EGMOND-AAN- ZEE.	2 F.	16 18	120 126	On Sand Hills, W. of village, 408 yds. apart	52 37.2	4 37.6				
KVKDUIN.	1 F.	20	161	On the Fort	52 57.1	4 43.5				
Nieuwe Diep.	1 F.	8	29	Extreme of Wierhoofd	52 58	4 47				
„	1 F. <i>Red.</i>	8	35	Inner part of do. W. N. W. of village	-	-	S. W. and N. E. 51 yards apart.	7	27	4
Texel Island.	1 F.	-	-	Oude Schild	53 2.5	4 51.4	East side of Texel Island.	6	30	4
EJERLAND SCHE GRONDEN.	1 Rev. ev. min.	18	164	N. E. extreme of Texel Island	53 11	4 51.4				
Vlieland.	1 F.	12	151	Highest Sand Hill E. end of Island	53 17.8	5 3.8	<i>Red</i> towards W. horizon, and <i>White</i> towards E.; obscured between S. W. $\frac{1}{4}$ S. and S. $\frac{1}{4}$ E.			
TERSCHELLING.	1 F.	22	177	Brandaris Steeple, near W. end of I.	53 21.7	5 13.1		8	40	6
Schiermonnik Oog.	2 F.	18 15	147 139	Sand Hills, W. part of Island, 1102 yds. apart	53 28.4 53 29.2	6 9.8 6 9				

1 Name Light
SOUTH LAND I Borselen.
Bath.
GOES HA
Neuzen o euse, A
THOLEN Gorishoe Stavenis
Zierikzee
„
Zijpe.
„
Ooltgens
Willems
Strijen-S
Dordsch (Dord
Krab, in Maas.
Vaardin
Pernis.
Schieda
Wiering
„
Kolhorn
Medemb
Ven or sche I
Enkhuiz

LIGHTS AND TIDES.—HOLLAND.

23

9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
						Lat.	Long.			

RIVERS SCHELDE AND MAAS.

M. 5	Ft. 10		Miles	Feet.		6.			H. M.	Ft.
						N. °	E. °			
		SOUTH BEVELAND ISLAND, Borselen.	1 F.	9	35	S. W. part of I., right bank of the Schelde	51 25	3 44		
		Bath.	1 F.	5	32	On the Inn, S. E. of the Fort	51 23·7	4 12·8		
		GOES HARBOUR.	1 F.	5	31	N. side of entr.	51 32·7	3 55·8		
		Neuzen or Terncuse, Axel I.	1 F.	10	43	W. Jetty	51 20·5	3 50	Left bank of W. Schelde.	
		THOLEN ISLAND.								
		Gorishoek.	1 F.	4	35	N. of the Ferry	51 31·6	4 4·8		
		Stavenisse.	1 F.	5	27	E. angle of Haven	51 35·7	4 0·5		
		Zierikzee.	1 F.	4	31	S. angle, near Zierikzee	51 37·9	3 55·4		
		"	1 F.	5	43	On the house, on W. Haven Head	51 37·9	3 53·6	Visible in the E. S. side in the road of Zierikzee and entrance of Romp.	
		Zijpe.	1 F.	4	31	Outer Dyke of Stooft Zolder	51 39·3	4 6·2	} Leading lts. for the fairway of Zype coming from the Krauncker	
		"	1 F.	5	39	Land side of Dyke	51 39·1	4 6		
		Ooltgensplaat.	1 F.	6	15	End of Harbour Dam, River Volgerak	51 40·9	4 22·2		
		Willemstad.	1 F.	10	41	W. Counter-scarp	51 41·8	4 26·6		
		Strijen-Sas.	1 F.	6	35	W. Head of outer Haven	51 42·7	4 35·6		
		Dordsche Kil (Dordt Chan.)	1 F.	6	48	W. extreme of Kil (Channel)	51 43·4	4 37·5		
		Krab, in the old Maas.	1 F.	4	31	On the Myl, at end of Krab	51 48	4 37·4		
		Vaardingen.	1 F.	-	-	-	51 54	4 1·9		
		Pernis.	1 F.	-	-	-	51 53·7	4 24·5		
		Schiedam.	1 F.	-	-	-	51 54	4 24·5		

ZUIDER ZEE.

		Wieringen.	1 F.	4	16	On the shore	52 53·2	4 56·3	} These lights, N. and S. 448 yds. apart, point out the track for vessels going from Zuider Zee to the Sioot (the Amsterdam quarantine) or from the Texel by Amstel Diep, towards Amsterdam.	
		"	1 F.	6	39	W. end of Island	52 53·4	4 56·2		
		Kolhorn.	1 F.	-	-	N. Jetty	52 47·7	4 15		
		Medemblik.	1 F.	-	-	N. Jetty	52 46·5	5 6·8		
		Ven or Geldersche Hoek.	1 F.	10	55	On an angle of Dyke	52 44·6	5 17·2		
		Enkhuizen.	1 F.	4	25	W. Jetty	52 42	5 17·8	This and Ven lt. are leading lts. for the Krab-bengat.	

## LIGHTS AND TIDES.—HOLLAND.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
		Miles	Feet.		N.	E.		H. M.	Ft.
Brockerhaven. Hoorn.	1 F. 1 F.	- -	- -	End of S. Jetty S. entrance of River	52 41·2 52 38	5 5·3 5 9·7			
Edam. Goud Zee.	1 F. 1 F.	- 7	- -	End of N. Jetty ¾ mile from N. W. pt., Marken I.	52 31·2 52 28	5 4·5 5 5·2			
Marken. Hoek, near Amsterdam.	1 F. 1 F.	10 10	52 58	E. pt. of Island Angle of the Y, on the N. Hoek	52 27·6 52 22·3	5 8·6 5 1·1	} Leading lights to clear the Paardanhoek, and head of Nieuwendam.		
Durgerdam. Westzaan.	1 Rev. <i>Red</i> . 1 F.	- 4	- 30	N. side of Y -	- -	- -		} Only in winter.	
Muiden. Eem.	1 F. 1 F.	- -	- -	E. side of entr. W. side of entr.	52 20·2 52 16·4	5 4·2 5 20·4			
Nijkerk.	2 F.	-	-	Entr. of Haven, 20 yds. apart	52 15·5	5 28·2			
Harderwijk. Elburg	1 F. 1 F.	- -	- -	S. side of entr. W. Jetty	52 21·2 52 27·3	5 37·3 5 49·6			
..	1 F.	-	-	Tower of the Gate	52 7	5 50			
Kampen.	2 F.	-	-	S. pt entr. of the Ijssel	52 34·9 W. Lt.	5 50·4	E. N. E. and W. S. W. 44 yards. In one, lead between the Jetties, and for 1½ miles up to entrance of the Ijssel.		
..	1 F. <i>Red</i> .	-	-	End of S. Jetty	52 35	5 48			
Schokland.	2 F.	8 12	37 47	N. & S. points of Island	52 39·5 52 37·2	5 46·9 5 46·7	N. light is <i>Red</i> from E. to N. W. by N., and <i>White</i> from E. to S. ½ W., and from N. W. to S. W. by W. ¼ W. Fog-bell.		
Urk.	1 Rev. ev. 2½ min.	10	82	S. W. point of Island.	52 39·7	5 35·8	The light continues 2 mins., then a flash, preceded and followed by a short eclipse. Between S. S. W. & W. the light must not be approached within 2½ and 3 miles.		
Ganze diep.	2 F.	-	-	W. side of Haven	52 36·7	5 57·7			
Kragchenburg.	1 F.	-	-	S. pt. of entr.	52 39·3	5 56·7			
Blokszjl.	1 F.	-	-	End of N. Jetty	52 43	5 56·8			
Kuinre.	1 F.	-	-	W. end of Jetty	52 47·1	5 49·4	¼ mile W. N. W. of the northern point of the Wellerzand.		
Lenmer.	2 F.	-	-	W. entrance of Haven	52 50·5	5 43	N. by E. & S. by W.		
stavoren.	1 F.	10	39	N. W. side of Harbour	52 53·2	5 21·8	} In one, they clear the rocks off the harbour marked by a <i>Red</i> buoy.		
..	1 F.	-	-	195 yds. W. S. W. of great light	52 53·2	5 21·5			
Hindeloopen. Workum.	1 F. 2 F.	- -	- -	W. side of entr. N. Jetty, S. side of entrance, 195 yds apart	52 56·7 52 57·7	5 24 5 24·7	In one, lead into the entrance of the Haven.		
Surig or Boontjes	2 F.	5	-	On the Aigue, W. of village, 170 yds. apart	53 7	5 23·5	In one, S. W. by W. ¼ W. and N. E. by E. ¼ E.		
Harlingen	2 F.	10	56	On Town Ram- part, and on N. Jetty	53 10·5	5 24·7	Lights in one, lead up to the entrance of the Haven.		

LIGHTS AND TIDES.—HAMBURG.

25

8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			

HANOVER.

M.	Ft.	Name of Light	No. of Lights, Character, &c.	Miles	Feet.	Where placed.	Position.		REMARKS.	H. M.	Ft.	
							N.	E.				
		BORKUM ISLAND	1 F.	18	142	Summit of Church Tower	53 35	6 40	Visible in the direction of the W. Eems. Beacons on Rothum Islet, in one with light-house, lead into E. and W. Eems.	10 30	8	
		Delfzyl.	1 F.	3	-	Entr. to Port	- -	- -		11 15	8	
		Kneek.	1 F.	8	29	Below Emden on the Dyke	53 20·3	7 3				
		WANGEROOG, (Oldenburg)	1 Rev. ev. 2min.	12	100	Near E. part of Island	53 47·5	7 54·2		12 0	9	
		Bremen Lt. V.	1 F.	3	36	Entr. of River in 9 fathoms.	53 49	8 7·2	From February to November. A Bell and Gun.	11 30		
		HOHE WEG.	1 F.	} In one tower	15	112	N. E part of flat, entr. of Weser	53 42·8	8 14·9	Visible on reaching the Schlassel Tonne, the outer or key-buoy of the Weser.		
		"	1 F.		7	44	- -	- -	- -	This small light will disappear on nearing the black buoy on the port side, on entering and near the buoys H. and J. On entering the Dwasgot channel, the light appears red when in a line with the red buoy, and it disappears on reaching the line of black buoy W. A.		
		Bremerhaven.	1 F.	-	-	Geest River.	- -	- -				
		HELGOLAND. (British)	1 F.	20	221	Summit of I.	54 10·8	7 53·1	Visible round the horizon. Proposed instead — Rev. light, 1865.	33	94	

HAMBURG, OR RIVER ELBE.

		Outer Lt. V. (of Elbe River.)	1 F.	-	36	N. W. by N. one mile from Red buoy at entr. in 12 fathoms	54 0	8 18	A Fog-bell. In rain and snow a Gun is occasionally fired.	12 0	11
		Loots Galliotte, Pilot Vessel.	1 F.	-	-	E. S. E. 1½ miles from outer Light Vessel	53 59·8	8 21	Carries a lantern at ½ mast, when within the second Lt. Vessel.		
		Middle Lt. V.	2 F. Red. Vertical.	-	35 17	3½ miles from Pilot Vessel	53 59	8 26·5	A Bell. Ships must pass to the southward of this vessel.		
		Inner Lt. V.	1 F.	-	35	Mid. Chan. of Norder Gatt.	53 58·3	8 31·3	Seen generally before losing sight of Helgoland light. If out of the Channel the Light Vessels fire guns, and by night burn blue lights.		
		NEUWERK.	2 F.	15	120	On the Island at entrance of River	53 55	8 30	S. by E. ½ E., and r. v. 685 yards apart.		
		Kugel Baak.	1 F.	-	60	- -	53 53·5	8 41·7	In line with Cuxhaven Lt. clears shoals to the Eastward.		
		CUXHAVEN. Bösch.	1 F. & Fl. ev. 70s.	12	80	W. side of entr.	53 52·3	8 43	In lower part of river, eclipsed 5s.	1 8	10
			1 F.	6	25	On the E. side	53 53·7	9 13·8	When the river is free from ice.		

E



## LIGHTS AND TIDES.—JUTLAND.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
Størens.	1 F.	Miles 6	Feet. 22	Entrance of Riv. Stør, N. Pier	53 49.3	9 24.1				
Glückstadt.	1 F.	6	24	N. Pier	53 47.1	9 24.5	Red only in the direction of the Inlet, otherwise White.	3 9	10	
Kraut Sand.	1 F.	-	-	S.E. part.	-	-				
Lühe Lt. V. in 10 feet.	1 F.	5	-	-	53 34	9 42				
Schulau.	1 F. Red.	-	41	Near the Schelp sand, N. side	53 34	9 40	A Fog-bell.			

## HOLSTEIN.—SCHLESWIG AND JUTLAND.

Sandlock Chan. Lt. Ves. and Pilot Ves.	1 F.	10	34	Entr. of River, in 4 fathoms	54 14	8 36	A Fog-bell, with a Gun. In as- cending the Eider to Drogden two small leading lts., W. of Tomningen, lead to a Floating lt. in the Sorrestrommen; thence steer for two leading lts. near Casting-Sül; thence two leading Red lts. conduct to two leading lts. near Wilkelminekoog; thence steer for a floating Green lt., then by the North and South Reach for a floating Red light, where vessels should wait for daylight to pass the Drogden.			
Vollerwick.	1 F.	-	-	-	54 17.2	8 47.5				
Katingsiel.	1 F.	-	-	-	54 17.5	8 50				
Tomning.	1 F.	-	-	-	54 19	8 57		2 1	9	
Fohr Island, E. side.	2 F.	4	19 15	Wyk Harbour	54 41.5	8 34.3	In one, lead into the Harbour.			
Dagebull.	2 F.	9	19 24	In the Dyke	54 43.7	8 41.3				
SVLT.	2 F.	10 12	64 W. 72	On List or N. end of Island, 2910 yds. apart	55 3.6 55 2.9	8 24.2 8 26.7	Western lt. reddish. Lts. in one lead over the Bar in 16 ft. at L. W. At ten miles distance, visible round the horizon.	2 21	6	
"	1 F. & Flsh. ev. 4 mins. for 15 s.	20	205	Röle Klif, near Bröns Hill, Kamp village	54 56.8	8 20.5	Changes to Red when over the bar, and bearing S.S.W. In the direction of Listerdyb it will shed a reddish reflection from N. by E. $\frac{1}{4}$ E. to N.E. $\frac{1}{4}$ E.			
Agger Channel Light Vessel.	1 F.	9	30	Inside the Chan.	56 45	8 15	15th November to 20th March.	4 9	2	
Thisted, Läm- fiord.	1 F. Red.	2	17	S. Pier.	56 57.3	8 41.9				
HANSTHOLM.	1 Rev. ev. $\frac{1}{2}$ min	20	218	N. W. pt., Jut- land	57 6.8	8 36.2				
HIRTSHAL.	1 F. & Fl. ev. 4 mins.	21	182	On the Point	57 35	9 56.6	The lt. is steady for 2 m. 55 s., then obscured for 27 s., a strong lt. for 11 s., and again obscured for 27 s., after which a steady lt.			

LIGHTS AND TIDES.—KATTEGAT.

27

I. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.	
							Lat.	Long.				
<b>KATTEGAT, WEST COAST.</b>												
					Miles	Feet.		N. °	E. °			
		SKAGEN ORSKAW	1 F.		18	144	¾ of a mile W. of extreme N. pt., Jutland	57 44.1	10 37.9	From E. ¾ N. to N.E. ¼ N. It shows very brilliant, less so on other points. Four black tables on a white board denote the Kattegat to be obstructed by ice. A <i>Red</i> Ball on old Skagen lighthouse indicates that the Laeso Lt. V. is not on her station.	H. M. 5 56	Ft. 1
		Aalbek.	2 F.		2	12	On the Beach, 14 yds. apart	57 35.7	10 25.5	A fisherman's light, shown from 1st September to 1st May.		
		Hutsholm.	1 Rev. ev. ½ min.		10	43	Summit of the S. Island	57 29.2	10 37.6	Bright 5 s., eclipsed 25 s. A <i>Red</i> Ball if Laeso Lt. V. is not on her station.		
		Frederikshavn, or Fladstrand.	2 F. <i>Red.</i>		4	22	S. Pier-head, 5 feet apart	57 26.1	10 32.7			
		Triandelen Rocks Light Vessel.	1 F.		9	31	E.S.E. ¼ mile from the rocks, in 7 fathoms	57 25.8	11 16	March to 31st December. A Fog-bell.		
		Laeso Channel Light Vessel.	1 F.		10	31	Eastward of Dvale Ground, in 10 fathoms	57 13	10 41.2			
		Hals, entrance of Låm Fiord.	1 F.		9	32	N. Pier-head	56 59.6	10 18.5	Visible round the horizon.		
		Kobber Grund Light Vessel.	3 F.		11	41 M	S.E. by S. from Nyvager, in 4 fathoms	57 8.7	11 20.7	March to 31st December.		
					9	29 F. & Miz.						
		ANHOLT ISLAND.	1 Rev. ev. 25 s.		14	122	About 1½ miles from E. pt. of Island	56 44.3	11 39.2	A F. lt. shows from E. side of Tower, (65 feet high, and visible 10 miles), when Anholt Lt. V. is not on her station.		
		Anholt Lt. V.	1 F.		10	31	About a mile E. of Knob reef, in 16 fathoms	56 45.7	11 51.3	March to 31st December. Gong.		
		FORNESS.	1 Rev. ev. ½ min.		13	69	N.E. ¼ E., 2½ miles from the entr. of Greenaa haven	56 26.6	10 57.6	Bright 6 s., eclipsed 24 s. A <i>White</i> flag, with blue perpendicular stripe, shows that the Great Belt is obstructed by ice.		
		HESSELØ.	1 F.		16	115	E. side of Island	56 11.8	11 42.8			
		Spotsbiørg.	1 Rev.		10	123	Isø Fiord, E. side of entr.	55 58.6	11 51.6			
		Hjelm.	1 F. & Fl. ev. 4 mins.		16	164	On Island	56 8	10 48.5	The Flsh. is preceded and followed by a short eclipse. A <i>White</i> flag, with blue vertical stripe, shows that the Great Belt is obstructed by ice.		
					19							

KATTEGAT, EAST COAST.

MORPE TANGE.	1 F.	15	95	On the Point	56 55	12 22	
NIDINGEN.	2 F.	12	66	On the Rock, each E.N.E. & W.S.W., 33 yards	57 18.5	11 53.5	N.W. of the Tower is a Steeple, where a Fog-bell is tolled.
Bottø.	1 F.	10	45	Winga Sound	57 39	11 43	Shown from 15th August to 15th April.

## LIGHTS AND TIDES.—LITTLE BELT.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Buskär.	1 F.	Miles 10	Foet. 82	Islet, in Winga Sound	° N. 57 38·2	° E. 11 40	<i>White</i> to seaward, at n distance; on a near approach becomes <i>Red</i> . 15th August to 15th April. N.E. $\frac{1}{2}$ N. and S.W. $\frac{1}{2}$ S., 138 yds. The N.E. lt. varied by flashes.	H. M.	Ft.
WINGA or VINGA	1 F. & Fl. } 1 F. }	15 each	81 each	Winga Island	57 38	11 36			
Nya Elsborg. Götheborg.	1 F.	11	44	Hvalfisken Bastion	57 41·2	11 50·3			
MARSTRAND.	1 Rev. ev. 2 min.	22	282	Karlsten Fort, highest point of Island.	57 53·5	11 35			
HALLÖ.	1 F. & Fl. ev. 40s.	16	119	S. E., $\frac{1}{4}$ mile from Salo Beacon, entr. of Aby Fiord	58 20·5	11 13			
KOSTER.	2 F. & Fl. ev. 7 s.	15 12	214 each	N. Islet of Group, highest point	58 54·2	11 0	N. and S., 78 yards.		

## LITTLE BELT.

Aarhus.	1 F.	6	39	S. end of Mole	56 9·3	10 13·5	Keep close to the S. Mole-head. Lighted occasionally.		
"	1 F. <i>Red</i> .	1	18	N. Mole-head	-	-			
THUNÖ.	1 F.	11	100	S. E. side of I., on Church Tower	55 57	10 26·8	<i>Red</i> in direction of Ronnen point, and <i>White</i> otherwise.		
Horsens.	2 F.	6	32 N. 11 S.	S. of the entr. 119 yds. apart	55 51·6	9 51·8			
Samsö.	1 F. & Fl. ev. 3 min.	14 to 16	119	Vestborg Point	55 46·2	10 33·4	Bright 15 s., eclipsed 25 s. Within 6 miles the eclipse between the steady light and flash is scarcely perceptible		
Bogensø.	1 F. <i>Red</i> .	3	20	On the Pier	55 34	10 5·1			
Fredericia.	1 F. <i>Red</i> .	3	18	N. Mole	55 33·6	9 45	From 1st September to May, excepting when moonlight.		
Middelfart.	1 F.	2	18	Pier-head	55 30·5	9 44			
Baagö Island.	1 F.	10	39	S.W. Point	55 17·7	9 48·1	Visible on all points but that to the S.W. by W., which is over the town.		
Assens.	1 F.	9	20	On the Pier, 15 yds. from head	55 16·3	9 53·6			
Aarö, Sleswig Shore.	1 F.	9	26	S. Mole of Harb.	55 15·7	9 42·9	November to 1st May. When the Packets pass through Aarö Sound a lantern is shown on the S. end of Aarö Island.		
Aabenraa, or Apenrade.	1 F. <i>Red</i> .	3	16	S. Mole of Harb.	55 2·5	9 26			
ALS.	1 F.	11	78	S. E. pt. of Id.	54 51·3	9 59·3	5th September to 1st May.		
Æreskjøbing.	1 F.	4	16	Navires Quay	54 53·4	10 25·6			
Eckernförde.	1 F.	-	-	Pier-head	54 28·2	9 50·3	The lt., N.W. by N., indicates the most convenient anchorage		
Bülk.	1 F.	11	51	Kiel Fiord entr., W. point.	54 27·4	10 11·9			
Friedrichsort.	2 F.	8 4	33 W. 16 E.	Ramparts of Fortress. Within the pt. of reefs on board a yacht	54 23·5	10 11·2	W.N.W. and E.S.E., 510 yards. Lights not shown unless the Fiord is navigable.		

1.  
Name  
LightDusternb  
Kiel.  
Femernsun  
MARJEN.

FAKKEBIE

Langelan

Neustadt.

SEIERO.  
REEF NES  
Kallundbo  
Halskov.

Korsör.

SFRUGÖ.

Knauds H

Slipshavn

Nyborg I

Agersö (C  
Sound)

Vairo.

Vordingb

Gaabense

Taars, L

Svendbor

LIGHTS AND TIDES.—GREAT BELT.

W. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.	
							Lat.	Long.				
M.	Ft.			Miles	Fect.		° N.	° E.		H.	M.	Ft.
		Dusternbrook.	1 F. <i>Red.</i>	6	19	Bathing Place	54 20·3	10 9·7				
		Kiel.	1 F. <i>Green.</i>	2	15	On the Pier	54 19·2	10 8·7	Gas.			
		Femersund.	1 F.	2	-	On the S. side	54 24·2	11 7·4	When Mail Steamer is expected.			
		MARIEN.	1 Rev. ev. ¼ min.	12	94	N.E. point, Femern Island	54 29·6	11 14·5				
		FAKKEBIERG.	1 F.	14	129	On Hill, a mile N. of S. point, Langeland	54 44·4	10 42				
		Langeland.	1 F.	9	28	S.W. of Tranekjær Castle	54 59	10 53	When Mail Steamer is expected.			
		Neustadt.	1 Rev. ev. 2 min. Bright 15 s.	11	46	Pelzer pt., S.E. by E., 2 miles from Neustadt entrance	54 5·3	10 51·8				

GREAT BELT.

SEIERO.	1 Rev. ev. 2 min.	15	103	N.W. pt. of Id.	55 35·2	11 5·1	Bright 20 s.
REEP NESS.	1 F.	12	79	Extreme pt.	55 44·6	10 23·4	
Kallundborg.	1 F.	6	25	On the Pier	55 41·2	11 5·1	
Halskov.	1 F.	10	52	Near Korsør	55 20·2	11 7·7	Not shown from 15th May to 31st July. A light just without this one, appearing as a torch light, shows for the guidance of Packets in dark weather.
Korsør.	2 F.	9	34 E. 26	N. side of entr.	55 20·2	11 8·5	Excepting 15th May to 31st July. For entering the Harbour, lights in one.
SPRÖGÖ.	1 Rev. ev. 15 s. Bright 2 s.	11	91	E. and highest part of Island	55 19·8	10 58·4	Within 12 miles, visible round the horizon.
Knuds Head.	1 F.	10	61	On the Head	55 17·4	10 51·3	Not shown from 1st August to 15th May. Intended to be a <i>Red</i> light.
Slipshavn.	1 F. <i>Red.</i>	6	20	Slips pt. Battery, entr. to Nyborg Fjord	55 17·1	10 49·7	
Nyborg Harbour	2 F.	2	15 7	Pier-head	55 18·8	10 48	When Mail is expected. To be kept in a line to enter the Harb. inside of Avernakke Point.
Agersö (Omö Sound)	1 F.	8	29	Helleholm, the S. point	55 11·1	11 12·7	A <i>Red</i> and <i>White</i> Ball over the lantern, in one with the Windmill on Helleholm Point, is the leading mark for entering Omö Sound from the Northward.
Vairo.	1 Rev. ev. 15 s. Bright 2 s.	10	51	N.E. pt. of Id.	55 2·2	11 22·2	
Vordingborg.	3 F.	4 2	6 15 8		55 0·2	11 55·2	When Mail is expected.
Gaabense.	2 F.	4 each	6 12		54 56·5	11 53	
Taars, Laaland.	2 F.	10 6	33 E. 18	N.W. Point	54 52·7 54 52·6	11 2·2 11 1·6	W. ½ N. and E. ¾ S., 663 yards.
Svendborg.	4 F.	4 ea. 2 ea.	17 10	On the Pier	55 3·5	10 37	Oct. to Mar. One <i>Green</i> , one <i>Red</i> .

## LIGHTS AND TIDES.—THE SOUND.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## THE SOUND.

		Miles	Feet.		° N. / ° E.			H. M. Ft.		
NAKKE HEAD.	2 F.	12 8	147 W. 98	N.E. point of Siælland	56 7.2 56 7.1	12 20.8 12 21.2	W.N.W. and E.S.E., 438 yards.			
KRONBORG.	1 F.	12	110	N.E. Tower of the Castle	56 2.4	12 37.6	Not seen when bearing about N N.E., being obstructed by the S.E. spire of the castle.			
Helsingør, or Elsinore.	1 F. <i>Green.</i>	4	17	S. Pier	56 2.1	12 37.4				
Vedbek.	2 F.	10	42 31	-	55 51	12 34.5	W. $\frac{1}{4}$ S. and E. $\frac{1}{4}$ N., 1200 yards. In one shows the direction of the Submarine Cable.			
COPENHAGEN.	1 F. & Fl. ev. 3 min.	8	41	E. side of Tre Kroner Battery	55 42.2	12 57.1	The flash light visible 11 miles.			
Dragør, or Drag- den Lt. V.	1 F.	9	31	200 yds. S.E. by S. of Quærtus Ground, in 4 fathoms	55 33.2	12 43.2	Shown from 1st March to 31st December. A Fog-bell.			
Kiøge.	2 F.	4	30 E. 33	On the Pier	55 27.1	12 11.5	In a line lead into the Harbour.			
CAPE STEVNS.	1 Rev. ev. $\frac{1}{2}$ min Bright 5 s.	15	144	N. 38° E., 1506 yards from Hoierodt church	55 17.4	12 27.5				
Rodvig.	1 F. <i>Red.</i>	6	18	Eastern end of Jetty	55 15.1	12 22.9				
MÖEN ISLAND.	1 F.	11	82	S.E. Point	54 56.8	12 32.7				
GIEDSER POINT.	1 F.	13	64	On S. pt. Falster Island, $\frac{1}{2}$ mile inland	54 33.8	11 58	From it the dangerous Trindelen Ground bears S.E. $\frac{1}{2}$ S. The lighthouse in one with a Black Tub beacon on the high shore, points out the direction.			
Falsterbo Lt. V.	2 F.	6	49	Ten yards from extreme point of Reef, in 5 fathoms	55 17	12 48	A Fog-bell.			
FALSTERBO.	1 F.	13	78	-	55 23.7	12 49.8	Shown from 1st August to 15th May.			
MALMO.	1 F.	12	49	W. Pier-head	55 36.7	13 1				
Landskrona.	2 F.	-	22	Harbour Quay	55 52	12 50	W. by N. $\frac{1}{4}$ N. and E by S. $\frac{1}{4}$ S., 191 yards. In one lead into the Harbour.			
Roa.	1 F.	-	-	-	-	-				
Helsingborg.	1 F.	-	-	-	55 59.6	12 44.4	A fishing light.			
Swine Bottom Light Vessel.	-	7	27	N. Pier-head	56 3	12 42				
KULLEN.	1 Rev. ev. 2 min. (vis. 30 s.)	20	288	On the face of the Hill	56 18.2	12 27	<i>Proposed.</i>			

LIGHTS AND TIDES.—PRUSSIA.

31

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

BORNHOLM.

Name of Light.	No. of Lights, Character, &c.	Miles each	Feet.	Where placed.	Position.		REMARKS.	H. M.	Ft.
					° N. /	° E. /			
... ..	2 F.	8	48 E. 29	E. lt. on the Mole. W. lt. in the Town	55 57	14 42	In a line lead into the Harbour.		
HAMMAR POINT.	1 F.	14	279	On Steilberg, near N. point of Island	55 17.1	14 46.8	Visible round the horizon.		
CHRISTIANSO, or E. BORNHOLM.	1 Rev. ev. 20 s. Bright 2 s.	14	91	On the largest tower of the fort.	55 19.3	15 11.6			

HANSE TOWNS AND PRUSSIA.

Travenmünde. (Lubeck.)	2 F. Vertical. Low lt. Red.	16 6	95 67	N. pt. of River, a mile below Travenmünde	53 59	10 53			
Warnemünde. (Mecklenburg)	1 F.	12	58	W. side of entr.	54 10.5	12 5.7	From 1st August to 30th April.		
DARS.	1 Rev. ev. min. 1 F.	16 12	108 41	On the Point	54 28.9	12 31	} Fixed light, shown only in the direction of Trindelen Reef (W. ½ N. to N.W. from the lighthouse.)		
ARKONA.	1 F.	22	200	Wittow Peninsula	54 41	13 26.2			
GREIFSWALD.	1 Rev. ev. 45 s. (White & Red.)	17	154	N.E. part of Island	54 14.7	13 55.4			
Swinemünde. Port of Stettin, Oder River.	1 F.	21	211	E. side of Harbour	53 55	14 17.6			
	1 F. Red.	10	39	E. Mole Head.	53 56	14 17			
HERSHÖFT	1 Rev. ev. 2 min. Vis. 70 s.	18	160	Near the village, 420 yds. from the shore	54 32.7	16 33			
RIXHÖFT.	1 F.	22	220	N. pt. Prussian Pomerania	54 50	18 20.7			
HELA.	1 Rev. ev. ½ min.	16	120	N.E. ½ E. 4 cables from the point	54 36.1	18 49.2			
DANZIG.	1 F.	14	75	Neufahrwasser Tower	54 24.3	18 40.2	} N. and S., 1647 yards.		
	1 F.	10	61	Extreme of E. Mole	54 25	18 40.1			
POLLAU.	1 F.	20	92	S.E. part of the Town	54 38.3	19 54.2	1st August to 15th May.		
BRUSTER ORT.	1 Rev. ev. 4 min.	20	142	On the Cape.	54 57.7	19 59.2			
MEMEL.	1 F.	20	98	N.E. side of entrance.	55 43.7	21 6.2	1st August to 15th May.		

## LIGHTS AND TIDES.—RUSSIA.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## RUSSIA.

		Miles	Feet.		° N. ° E.			H.	M.	Ft.
LYSER ORT.	1 F.	13	127	On the Cape, 1100 yards in shore	57 34.2	21 44.1	From 28th May to 13th July.			
SWALFER ORT.	1 Rev. ev. 1½ min.	12	120	S. point, Osel Island	57 54.6	22 4.2	From 28th May to 13th July.			
FILSAND (W. of Osel Island.)	1 F.	13	127	W. pt. of Filsand Island	58 23	21 49.9	From 28th May to 13th July.			
Dome Ness.	2 F.	10 8	92 57	Extremity of the Ness, S.S. W. ¼ W. and N.N.E. ¼ E., 106 yards.	57 45.6	22 37.5	In a line they point out the direction of Dome Ness Reef. 28th May to 13th July.			
Ness Lt. V.	1 Rev. ev. 3 min.	8	-	N. of the White buoy, 933 yds. from the reef, in 15 fathoms	57 48.9	22 39.1	A Gong. 28th May to 13th July.			
RUNÖ.	1 F.	16	200	Hochberg, S.E. elevation of the Island	57 48.1	23 15.5	28th May to 13th July.			
Kuga, Mouth of River Dwina.	1 F. & Flsh. ev. ¼ min.	16	103	Fortkamet Dike (1 Tower.)	57 3.5	24 1.3	Lights vertical. The low light <i>Red</i> , seen from E.S.E. by S. to S. by W.			
	1 F. <i>Red</i> .	9	21				Vis. only from S.E. eastward to E. by N. ¼ N.			
	1 F. <i>Green</i> .	10	26	N.W. extreme, Magnusholm dike, N. side of entrance	57 4	24 1				
Kinö.	1 Rev. ev. ¼ min.	11	92	S. part of Island	58 5.8	23 59.6				
Pernau.	2 F.	-	-	S. entrance	58 23	24 30.3	From 1st September to end of season. N.E. by E. and S.W. by W., 406 feet apart.			
Wörnso, entr. to Moonsund.	1 F.	14	67	W. part of Id.	59 1.7	23 8.3	Shows <i>White</i> over Stapelboten Shoals, from S.W. ¼ W. to S. by E. ¼ E. <i>Red</i> from S. by E. ¾ E. round by E. to N. ¼ E.			
Werder, Moon- sund.	1 F.	11	94	W. point of Id.	58 34	23 31.3	<i>White</i> from N. ¼ W. to N.N.E. ¼ E.; <i>Red</i> from N.N.E. ¼ E. eastward to S.E. by S.			
DAGER ORT.	1 F. & Fl. ev. min.	21	328	Hill, near W. pt. of Dagö Id. 5 miles inland	58 55	22 15.2				
ODENSHOLM.	1 F.	16	102	N.W. pt. of Id.	59 18.3	23 22.2	Shown from 28th May to 13th July.			
PAKER ORT.	1 F.	14	155	On the Cape	59 23.3	24 2				
SOUROP.	1 F.	13	135	N. Cliff of the Cape	59 27.9	24 24				
"	1 F.	10	48	1½ miles east- ward of old Tower	59 28.4	24 26.2				
NARGEN.	1 Rev. ev. min. vis. 10 s.	13	136	N. end of Island	59 36.4	24 32				
Revel-stein Light Vessel.	2 F.	-	-	N. side of reef	59 43.3	24 44	Shown from 28th May to 13th November. A <i>Yellow</i> flag, <i>Blue</i> cross. A Fog-bell.			

LIGHTS AND TIDES.—RUSSIA.

3. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.	
							Lat.	Long.				
				Miles	Fect.		° N.	° E.		H. M.	Ft.	
		REV. L., OR KATE- RINDAL.	2 F.	15	178	Mount Laks- berg, near Revel Marine Barracks	59 26.3	24 49.2	A Turret on roof of lighthouse, painted in stripes, to distinguish it from adjacent buildings. Both lights in one S. by E. lead to Revel Road.			
				19	268	Mount Laks- berg, behind Revel	59 25.8	24 49.5				
		Naval Port	1 F. <i>White</i> .	3	-	E. pass, extre- mity of Mole	59 27	24 47.6	On the wall, entrance of the Naval Port. Entering the Port the <i>White</i> lights must be left to N., and <i>Red</i> to South.			
			1 F. <i>Red</i> .	3	-	S. Pass	59 27	24 47.3				
			1 F. <i>White</i> .	3	-	W. pass, extr. of Mole	- -	- -				
		Kokskar.	1 F. <i>Red</i> .	3	-	S. pass	- -	- -				
			1 F.	15	100	On the Rock	59 41.7	25 1.5				
		EKHOLM.	1 F.	14	101	N. point of Id.	59 41.1	25 49				
		Rödskar.	1 Rev. ev. min.	9	74	On the Rock	59 58.1	26 41.1				
		HÖGLAND.	2 F.	22	383 37	N. point of Id., and on the adjacent hill	60 5.7 60 6.4	26 58.4 26 58.7	N. by E. $\frac{1}{2}$ E. and S. by W. $\frac{1}{2}$ W., 1250 yards. Fog-bell.			
			1 F. <i>Red</i> .	8	51	On the S. point	60 0.7	27 0				
		SOMMARS.	1 F.	10	85	W. hill of Island	60 12.2	27 39.8				
		Seskar.	1 Flsh. ev. $\frac{1}{2}$ min.	14	97	N. W. point of Island.	60 2.1	28 23				
		Narva.	1 F.	9	70	S. point, entr. of River	59 28	28 3.7				
		London Shoals Light Vessel.	3 F.	7	23 one 17 two	Extr. of Shoals, Tolboukin Lt- ho., N. N. E. $2\frac{1}{2}$ miles	60 0	29 31	Lights lead into Kronstadt Roads. A Fog-bell.			
		TOLBOUKIN.	1 F.	11	95	On an Islet W. of Kronstadt Island	60 2.6	29 33.8				
		KRONSTADT.	2 F. <i>White</i> . Low <i>Red</i> .	12 8	55 37	S. side, St. Nicholas Bat- tery	59 58.7	29 46.5	Vertical.			
			2 F.	5 each	24	Merchant's Gate Mele Head, one on each Mole	59 59	29 46.6				
			1 F.	6	38	Frederikstadt. Angle, S. bas- tion of Kron- stadt Harbour	59 58.2	29 48.5	Fog-bell.			
		Oranienbaum.	1 F.	6	45	W. Pier	59 55.9	29 46.5	Leads into the Channel. Fogbell.			
		Petërhof.	2 F.	6	34	Extreme of Pier	59 53.5	29 56.7	Shows the Roadstead, and leads into the entr. of Galley Chan.			
		Elagin Yelaguin Light Vessel.	1 F.	5	16	Entr., N. Chan., 350 yds. out- side its mouth	59 58.3	30 9.3				
		Neva Lt. V.	1 F.	6	38	Entr. Ship Chan. 300 yds. out- side its mouth	59 55.3	30 10.6				



## LIGHTS AND TIDES.—SWEDEN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Kalbaden-grund Light Vessel.	1 F.	Miles 7	Fect. 31	S. side	° N. 59 58.5	° E. 25 36.5		H. M.	Ft.
Sedersher, or Söder Skar.	1 F. & Fl. ev. 1½ min.	16	124	Entr. to Borge	60 6.7	25 25.5			
RENSKAR.	1 F.	15	172	On the Skar, 1½ miles S. ¼ W. of Porkala Pt.	59 56.2	24 24.7			
HANGÖ.	1 F. & Fl. ev. 2 min.	15	112	S. E. pt. of Id., 3 miles S. ¼ W. from Hangö Head	59 46	22 58			
OCTÖ, or UTO.	1 F.	13	130	About middle of Island	59 46	24 22.2			
Eckerö.	1 F.	5	36	Head of Inlet	60 13	19 29			
LAGSKAR.	1 F.	14	101	N. Point	59 50.8	19 55.8			
ENSKAR.	1 F.	14	152	On the Island, 9 miles N. W. from Löpertön Pilot Station	60 43	21 0.7			
Ostra Finngrund Light Vessel	1 F.	10	-	1½ miles N. E. by E. ¼ E. from the shoalest part	60 57.2	18 30	A Fog-bell.		
NORRSKAREN.	1 Rev. ev. min.	12	105	W. Islet	63 13.9	20 37.7	Points out Brando Harbour, near the town of Wasa.		
Bjorneborg.	1 Rev.	-	-	-	61 35	21 21	<i>Proposed.</i>		
Christinestadt.	1 F.	-	-	-	62 15	21 12	<i>Proposed.</i>		
Danö Gården.	1 F.	-	-	-	63 56	23 8	<i>Proposed.</i>		
Uleåborg.	1 Rev.	-	-	-	65 1	25 28	<i>Proposed.</i>		
Maakala.	1 F.	-	-	-	-	-	<i>Proposed.</i>		

## SWEDEN.

Haparanda and Tornea.	1 F.	10	78	Malören Rock	65 31.7	23 36			
Tornea.	1 F.	-	-	Canal Entrance	-	-	<i>Proposed.</i>		
BURO.	1 F.	18	171	On the Head	64 29.2	21 35.7			
UMEA, in the N. Quarken	1 Rev. ev. 2 min. vis. ¼ min.	15	101	Fjäderaggi Great Rock	63 47.8	21 1			
HOLMÖ GADD.	1 F.	12	70	Holmö S. Gadd Rocks	63 35.8	20 47.5	A strong glare in a S. S. W. ¼ W. direction, to mark the Gadd- snytan Shoals.		
Sydost Brötten Grunds Lt. V.	1 F.	10	37	2½ miles from S. edge	63 19	20 0	A Fog-bell.		
Lungö Id., near Hernösand.	1 F. & Fl. ev. 3 min.	12	78	S. point	62 38.5	18 6	Dwelling-house, Red 250 ft. N. W. of the Tower. A flash, lasting 7 s., is preceded and followed by intervals of darkness, each being of 20 s. duration; a F. lt. then appears for 2 min. 13 s., followed by the interval of darkness which precedes the flash.		
BRAND.	1 F.	17	101	N. E. point of Id.	62 13.2	17 37			

LIGHTS AND TIDES.—SWEDEN

35

W. C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Feet.		N.	E.		H. M.	Ft.
		Agon Island, off Hudikswall.	1 Rev. Flsh. ev. 20 s.	12	95	E. point	61 33	17 29			
		Stor. J. S. GFRUN. Bönan.	1 F.	44	86	On the Id. E. side	61 9.9	17 21			
			1 F.	6	62	Near Custom House	60 43.9	17 18.7			
		Eggreground.	1 F.	9	52	Roof of a Dwelling-house	60 43.4	17 32			
		Biörn Rock.	2 F.	10 ea	42 ea.	On the Rock	60 37.7	17 59.5			
		ÖRSKAR.	1 Rev. ev. 2 min. Flsh. ½ min.	16	118	On the Island	60 31.5	18 22.3			
		Grundkalle Light Vessel.	2 F.	10	40 ea.	E. of N. part Grundkalle Shoal	60 30	18 55			
		DUBSDEN, in Öre Ground Bay.	1 F.	12	65	W. point Gräso Island	60 22	18 24.3			
		UNDERSTEN, S. Quarken.	1 F.	12	78	On the Rock	60 16.2	18 55.3			
		SVARTKLIP, S. Quarken.	1 Rev. 3 Flshs. ev. 2 min.	13	68	On the Rock	60 10.3	18 50			
		Grissel Hamm	1 F.	1	-	On the Beach	60 5	18 49.5	Lighted occasionally when mails are at sea		
		Naskubben Rock	1 F.	8	21	Off Biörko	59 52.7	19 5.5	Vessels pass to E. of this light at the distance of 200 feet.		
		SÖDERARM.	1 Rev. ev. 2 min. Flsh. ½ min.	14	99	On Tollska, near the old Beacon	59 45.4	19 28			
		GRÖNSKAR.	1 F.	15	111	On the Rock	59 17.3	19 3			
		KORSÖ.	1 Rev. ev. 2 min. Flsh. ½ min.	17	151	On the Islet	59 17.2	18 58.3			
		LANDSORT.	1 Rev. ev. 2 min. Flsh. ½ min.	18	144	S. point of Id.	58 44.5	17 52.7			
		GOTSKA SANDO	2 F.	16	140 ea.	N. part of Id.	58 23.2	19 12.7	Outer lt. from N. shore, 250 yds.; lights in one show the S.W. edge of Koppar Stenarne shoal.		
		HARADSKAR.	1 F. & Flsh. for 7 s. ev. 1 ¼ min.	17	117	On the Islet, S.W. extreme	58 8.8	16 59.7	Eclipse of 19 s., a steady lt. for 45 s., and an eclipse of 19 s.		
		GÖTTLAND.	1 Rev. ev. 1 ¼ min (Max. 20 s.)	14	100	Faro Id., Hohn point	57 57.4	19 23.3	Very brilliant for ¼ of a minute.		
		"	1 F.	14	101	Ostergarn Id.	57 26.5	19 0			
		"	1 Rev. FL 1 ½ min.	16	166	Hoburg Hill, S.W. pt. of Id.	56 55	18 8.4			
		"	2 F.	-	-	Westergarns, centr. of Port	57 27.3	18 9.7	In a line show the direction of the channel.		
		"	1 F.	10	-	Utholm Island	57 26	18 7.3			
		ÖLAND.	1 F.	12	103	Biörnabben Rock, off N.W. point of Id.	57 22	17 6.5			
		"	1 F.	17	133	S. point of Id.	56 11.8	16 24.5			
		"	1 F.	10	22	Near Borgholm	56 52.4	16 38			
		Grimskar.	1 F.	12	48	Near Kalmar.	56 39.1	16 22.1			
		UTKLIPPOR RKs.	1 Rev. ev. 2 min.	11	50	On Tower on the S. Rock	55 57	15 43			
		SANDHAMMAR.	2 F.	15	104	On the Cape	55 23	14 11.5	N.N.W. and S.S.E., 750 yards.		
		Ystad Harbour.	1 F. White.	10	51	On Beach, N. of Port	55 25.5	13 50	N.E. by N. and S.W. by S., 484 yards.		
			Red.	4	20	W. Pier-head					
			Green	2	15	E. Mole					

## LIGHTS AND TIDES.—NORWAY.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
NORWAY.									
			Miles	Feet.		° N.	° E.		H. M. Ft.
Heg Holm.	1 F.		4	23	N. pt. of Rohu	59 53.1	10 43.5		
Steilene.	1 F.		6		Middle of Island	59 49.4	10 36.5		
Filtvedt.	1 F.		6	24	W. shore	59 34.8	10 37.7		
Rod Point.	1 F.		6	35	On pt., E. side, entr. to Drums Fiord	59 31.9	10 26.3		
Basto.	1 F.		12	37	N. E. point of Id.	59 23.3	10 33		
Moss Haven.	1 F. <i>Red.</i>		3	10	E. side of Canal, S. entrance	59 26.4	10 39.8		
Torgerso.	1 F.		3 or 4	10	N. W. pt. of Id.	59 15.5	10 30.9		
F. LERUK.	1 Rev. cv. 3 min. <i>White glare for last 10 s.</i>		12 to 14	55	Middle of Id.	59 11	10 36.7		
Torganten Id., Frederikstad	1 F.		10 or 12	36	S. point	59 9.5	10 50.3		
FÆRDER.	1 F.		24	150	Little Færder, or Tristenen	59 2	10 32.1		
Frederiksværn.	1 F. <i>Red.</i>		6 or 8	140	Stavaærnsø, S. pt., E. side of Channel	58 59.5	10 4.5		
Langotangen.	1 F.		10 or 12	40	S. pt. Langø Id., entrance to Langesund Fiord	58 59.7	9 45.8		
JOMERLAND.	1 Rev. cv. 30 s.		18 or 20	130	Middle of a low wooded island	58 52.2	9 36.2		
Stangholm.	1 F. <i>Red.</i>		8 or 10	33	E. point of Id.	58 42.7	9 15		
TORUNGEN ISLANDS.	2 F.		18 or 20	130 each	S. or outer Torungen	58 24.1	8 47.7		
					N. or inner Torungen	58 24.8	8 48		
Arendal Sandvig-ødder entr.	1 F.		8 or 12	42	Sandvig point, W. side of Channel	58 26.3	8 47.4		
Oxø, entrance to Christiansand Fiord.	1 F.		18 or 20	135	S. end of Island	58 4.4	8 3.6		
Oddero, Christiansand Fiord.	1 F. <i>Red.</i>		10	27	S. W. pt. of Id.	58 8.2	8 0.5		
NAZE OF NORWAY, or LINDENNES.	1 Rev. cv. min. vis. 12 s.		24	159	On the Cape	57 59	7 3		
LISTER.	3 F.		18 or 20	Highest 125	W. pt. of Lister Island	58 6.5	6 34.2		
Varnas, or Varnas.	1 F.		6 or 8	87	S. point of entr., Lister Fiord	58 10.6	6 37.3		

} N. N. E. and S. S. W., 1200 yards.

EGERØ.  
" "  
" "  
Lille Fjell  
Fladhølm  
Tunge N  
HYDUNG  
Fjellø  
Skude N  
Skude N  
Bukke S  
Kobbervig  
side of  
VDSIRE.  
Høieværn  
SARHØG,  
entranc  
Røevær.  
Ryværden  
Espevær.  
Langevæn  
Bomnæ  
E. side.  
Midtholm  
Folgeræn  
SLØTTERØ  
FIORD,  
Øxhamm  
Pirrholm

LIGHTS AND TIDES.—NORWAY.

1.	2.	3.	4.	5.	6.		7.	8.	9.
					Position.				
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
		Miles	Feet.		° N.	° E.		H. M.	Ft.
EGERÖ.	1 F.	12	71	S. E. point, or Vibberødden	58 25.3	5 59.6			
"	1 F.	20 or 24	150	W. pt. of Island	58 26	5 52.2			
"	1 F.	12	41	Grundsund Holm, N. W. point	58 27.8	5 54.2			
Lille Feisteen.	1 F. <i>Red.</i>	12	66	On the Island	58 49.5	5 39.9	Visible round the Compass.		
Fladholmen	1 F.	8	42	N. W. point of Island	58 55.3	5 33.7			
Tunge Ness.	1 F.	4 or 6	31	On N. point, 500 yds. N. W. of old Lt.-ho.	59 2.1	5 31.2	From 15th July to 16th May.		
HVIDINGSÖ.	1 F. & Fl. ev. 4 mins.	20 or 22	145	S. side of Id.	59 3.7	5 24.4	The flash is preceded and followed by a short eclipse of 25 s. Beyond 16 miles nothing is seen but the flashes; and it then assumes the appearance of a revolving light.		
Fiedo.	1 F.	6	-	On the Island.	59 5.3	5 34.4	From 15th July to 16th May.		
Skude Ness Havn	1 F.	4	-	"	59 8.4	5 16.8	From 15th July to 16th May.		
Skude Ness.	1 F.	6	75	S. E. point of Karmo	59 8.4	5 18	From 1st October to 1st April. Screened to the S. W., its limits will not extend more westerly than S. W. to W., clears the Ost-bean Rock, one cable's length.		
Bukke Sand.	1 F.	4	-	Bukken Island, E. side, narrowest part of the Sound	59 13.4	5 27.6	From 1st October to 1st April.		
Kollbervig, E. side of Karmo.	1 F. <i>Red.</i>	3	31	N. side of entr.	59 17.2	5 19.7	From 15th August to 1st April.		
UDSIRE.	2 F.	20 or 22	248 each	W. side of Id.	59 18.3	4 52.7	N. W. and S. E. 220 yds. Shown all the year.		
Höievarde.	1 F.	6	63	East side of Karmo	59 19.3	5 19.5	All the year.		
SARHOG, N. entrance.	1 F.	12	70	On Rock	59 25.4	5 14.7	All the year.		
Røevar.	1 F.	4	92	Gittero	59 26.1	5 7.7	Not seen eastward. Shown from 1st October to 1st April.		
Ryvarde.	1 F.	4	63	On the point, leading into Bommel Fiord	59 31.6	5 13.9	From 15th July to 16th May.		
Espevar.	1 F.	4	75	S. entrance of Harlbouur	59 35	5 9.3	From 1st October to 1st April.		
Langevaad, Bomnelö Id., E. side.	1 F.	3 or 4	16	Lille Blegan	59 36.7	5 15.2	From 15th July to 16th May.		
Miltholmen.	1 F.	4 or 6	38	Mosterhavn	59 42	5 24.2	From 15th July to 16th May.		
Folgeren.	1 F.	4 or 6	50	On Island, at Stoksund	59 47.8	5 18.7	From 15th July to 16th May.		
SLOTTERO, SELBO Fiord, S. entr.	1 F.	18 or 20	148	On the Island	59 54.5	5 4.5	Visible eastward and towards the Fiord. All the year.		
Öxhammer.	1 F.	4	130	E. side of Sellö	59 59.3	5 13.3	From 15th July to 16th May.		
Piir Holm.	1 F.	4	32	Bagholm Sound	60 5.2	5 11.5	From 15th July to 16th May.		

9.  
W. t  
E. C.  
Rise of Springs.

M. Ft.

## LIGHTS AND TIDES.—NORWAY.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Leeröen.	1 F.	Miles 4	Feet. 55	W. side of Id.	60 14.3	5 10.3	From 15th July to 16th May.	M. H.	Ft.
Bergen.	1 F.	4	40	Nordnes point	60 24	5 18.5	From 15th August to 30th April.	1 30	4
SKJÆLLANGER.	1 F.	12 or 14	56	N.W. side of Holzenö Id.	60 36.6	4 37	Shown from 15th July to 16th May. Serves as a guide to vessels taking the north passage to Bergen.		
HELLESO.	1 Flsh. ev. min. of 12s. duration	18 to 20	150	On the Island	60 45.1	4 43	Between the flashes an eclipse when 8 miles distant. A new tower building and a temporary F. Lt., visible 10 miles, shows 14 feet N.N.E of new tower, and when bearing between S. and S.W. $\frac{1}{2}$ W. is covered by the new tower.		
RONDÖ.	1 F.	20 or 24	157	W. pt. of Id., Bred Sound	62 25	5 35.2	From 1st August to 16th May.		
Hogsten.	1 Rev. ev. 3 min.	12	40	Godø Id., S.E. point; Bred Sound	62 28	6 1.5	From 1st August to 16th May. Vessels must keep to the west- ward of light.		
Aalesunds.	1 F.	4	12	Moløen point	62 28.7	6 8.5	From 16th August to 1st May.		
Walderhong.	1 F.	4	40	S. point of Walderö	62 30.1	6 7.4	From 16th August to 1st May.		
Lepso Reef Lt.V.	1 F.	4	24	S.E. part of reef, in 3 fathoms	62 35.5	6 14.5	Visible round the horizon. Shown from 1st August to 16th May.		
QVITHOLM.	1 F. & Flsh. of 12 s. ev. min.	18 or 20	130	N.W. pt. of Id.	63 2.2	7 12.5	Between the flashes an eclipse when 8 miles distant. Shown from 1st August to 16th May.		
CHRISTIANSUND.	1 F.	12	63	Stavnes, the N.E. point of Averö	63 7.3	7 38.2	Shown from 1st Aug. to 16th May.		
Leervig.	1 F.	-	-	N. side of Id.	63 6.5	7 42	" "		
RINGHOLM.	1 F.	14	50	On the Rock, $\frac{1}{2}$ mile off E. pt. of Eddö	63 18.7	8 13.4	" "		
Terningen.	1 F.	12	97	On the Island	63 29.6	9 9	" "		
Agdenas.	1 F.	Sto 10	113	On the point	63 38.2	9 49.5	" "		
Munkholm, Trondhjem.	1 F.	10	43	On the Fortress	63 27.2	10 24.8	" "		
Rödlö.	1 F.	16	273	Highest pt. of Island	64 22.5	10 27.4	" "		
VILLA.	1 Rev., ev. 4 min. a flash.	18 or 20	128	On the Island	64 32.8	10 41.9	" "		
PRÆSTÖ, Falden Fiord.	1 F.	12	35	On the Islet	64 47.4	11 7.5	" "		
Buholmen, or Brønösund entrance.	1 F.	10	41	N. side of Id.	65 28.5	12 13.5	From 15th August to 1st May.		
Gryto Island.	1 F.	16	106	S.E. side of Id.	67 23.3	13 52.7			
Vaag, or N. Hellig Vær.	1 F. <i>Red.</i>	12	48	N.E. pt. of Id.	67 36	14 1.7	From 15th August to 1st May.	6 0	91
Kloppe, or Glopen.	1 F.	10 or 12	130	Sörvaagen, S. side of entr.	67 53.5	13 4.5	1st September to 14th April.		
Reine Harbour.	1 F.	6	40	Olenilsöens Island's point	67 55.8	13 8.5	" "		
Svinö.	1 F. <i>Red.</i>	10 or 12	190	Near Balstad	68 3	13 34.5	" "		

Name  
of Light

Stamsund

HENNING

Sjaaholm

Orsvaag.

Kjeßen,

Island,

Stanghol

Hjerthol

ANDENÆ

Hekkinge

lang Fj

Hammerf

Tarn Hol

Sviatoi N

ORLOV.

MONJOVE

Sostovets

MOUDIC

JUGINSK.

Solevetsk

\* The Lig

LIGHTS AND TIDES.—WHITE SEA.

39

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility: Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs. Ft.
							Lat.	Long.		H.	M.	
M. H.	Ft.	Stamsund.	1 F.	6 or 8	56	Tornholm, S. point.	68 7.2	13 53	1st September to 14th April.	H.	M.	Ft.
1 30	4	HENNINGSVÆR.	1 Rev. ev. 3 min.	16 or 18	110	Quitverden	68 8.5	14 14.5	From 15th August to 1st May.			
		Sjaaholmen.	1 F.	4	30	Skraaven's Harbour	68 9.5	14 41.5	From 1st September to 14th April.			
		Orsvang.	1 F.	6	89	Sagöen Id., N. E. side	68 11.7	14 27				
		Kjøen, or Kie Island, S pt.,	1 F.	4	52	Svolvar	68 13.2	14 37	1st September to 14th April.			
		Stangholm.	1 F.	11	42		68 10.6	15 38	15th August to 30th April.			
		Hjertholmen.	1 F.	10 or 12	65	Lödingens Harbour, E. side	68 24.5	16 3	15th August to 1st May.			
		ANDENÆS.	1 F. & Flsh. ev. 3 min.	18 or 20	130	N. part	69 19.5	16 8.2	15th August to 1st May. Visible round the horizon.	12	0	
		Hekkingen, Malang Fiord.	1 F.	14	68	Hekking Island, N. side	69 36	17 50.5	15th August to 1st May.	12	0	
		Hammerfest.	1 F.	10 or 12	33	Fuglenæs Id., extreme point	70 40.2	23 40	25th August to 20th April.	1	10	9
		Turn Holm.	1 F.	-	-	Ingo Island	71 5	24 4	<i>Building.</i>			
<b>WHITE SEA.*</b>												
		Sviatoi Noss.	1 F.	20	298	Highest, or Southern Hill	68 9.8	39 47.7		9	15	14
		ORLOV.	1 F.	17	222	N. E. pt. of Cape, 1200 yds. from the Beach	67 11.2	41 20.5				
		MORJOVETS.	1 F.	14	150	N. W. point of the Island, 540 yards in shore	66 45.7	42 30		11	20	17
		Sosnovets.	1 F.	13	139	Centre of Island	66 29.3	40 43.4		11	44	18
		MOUDUGA.	1 F.	16	140	Near the Berezov Bar, Dvina R.	64 55.5	40 16	Archangel Pilots meet vessels 4 miles without the Shoals of the Bar.	5	50	3½
		JUGANSK.	1 F.	17	140	N. height of the Id., Gulf of Onega	65 12.2	36 51		5	15	4
		Solovetski Id.	1 F.	-	-	On Sekirnoi Hill, Church, Onega Gulf	65 7	35 37.5	<i>Temporary, on trial.</i>	5	0	4

\* The Lights in the White Sea are shown from 1st August to 1st November; the two last mentioned until the 16th of that month.

# FRANCE.—N. W. COAST.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
OCESANT. (Ushant)	1 F.	Miles 20	Fect. 272	Stiff Bay, N. point, N. E. pt. of Island	48 28.5	5 3.5	- - - - -	H.	M.	Ft.
„	1 Rev. ev. 20 s.	24	223	N.W. pt. of Id.	48 27.6	5 7.8	Eclipses, succeeded by one <i>Red</i> and two <i>White</i> faces, each lasting 20 s.	3	32	19
Abervrach.	1 F. <i>Red</i> .	10	226	Plouguerneau Steeple, W. side	- - -	- - -	} S. E. by E. & c. r., 2½ miles. These two lights in one lead into the Channel, 80 yards S. of the Petit Pot de Buerro.			
„	1 F.	4	59	Ile Vrac'h, N. side of entr.	48 36.9	4 34.7				
„	1 F.	4	49	Head of St. Antoine Creek	48 35.7	4 33.5	} These two lights in one, take up from the former lights, when the Petit Pot is passed, and lead up to the anchorage.	4	14	22
„	1 F. <i>Green</i> .	3	29	E. pt. of Paluc Beach	48 35.9	4 33.7				
ILE VIERGE.	1 F. & Fl. <i>A Red</i> Flash ev. 4 min.	15	108	109 yards from the E. point of the Island	48 38.4	4 34.2	The <i>red</i> flash is preceded and followed by a short eclipse, which does not appear total within the distance of 12 miles.			
ILE DE BAS.	1 Rev. ev. min.	24	223	Western part of the Island	48 44.7	4 1.7	In ordinary weather the eclipses do not appear total within the distance of 12 miles.	4	49	23
Morlaix.	1 F.	10	52	Jardin, or Louët Island	48 40.5	3 53.4	- - - - -	4	53	24
„	1 F.	14	285	Tour la Lande	48 38.2	3 53.2	} S. W. by S. and N. E. by N. In one, they give the direction of the Channel.			
„	1 F. & Fl. ev. 2 min.	10	-	Ile Noire	48 40.4	3 52.6				
„	1 F. <i>Red</i> .	2	46	Chateau du Taureau	- - -	- - -	To light the anchorage in the N. part of Morlaix Road.			
Triagoz.	1 Rev. Flash. <i>Red</i> and <i>White</i>	12	96	Guen Bras	48 52.3	3 38.9	- - - - -			
Ploümanach Port.	1 F. <i>Red</i> .	5	69	On the point	48 50.3	3 29.1	- - - - -	5	15	24
Perros Road.	1 F.	10	33	S. E. shore, near Nantouar Bridge	48 48.1	3 23.8	The Nantouar and Kerjean lts. in line indicate the direction of the western passage into Perros Bay; the Pigeon-house and Kerprigent lights in line, the direction of the eastern passage. Vessels intending to enter the Port of Perros by the western passage should leave the line of direction of the two former lts. a little before the Pigeon-house and Kerprigent lts. come in sight; the two latter lights in line lead in.			
„	1 F.	12	253	<i>En Arad</i> , Kerjean, 750 yds. from former lt.	48 47.8	3 23.5				
„	1 F.	12	89	<i>En Arad</i> , behind the Pigeon-house, 328 yards.	48 47.9	3 26.7				
„	1 F.	12	259	<i>En Arad</i> , Kerprigent, 1½ mile from former lt.	48 46.7	3 28.4				

1

Nam  
Lig

Tréguier

„

SEPT ISL.

HEAUX D  
BREHA  
Bréhat Is

Iles Saint  
Portrieux

Binic Port  
Légué Po  
FREHEL.

St. Malo.

Minquiers  
Light V  
Cancale, I  
La Hou  
GRANVILLE

„

CHAUSEY

Régneville  
Sénéquet.  
Portbail.

„

CARTERET

Diclette.

JERSEY.

„

„

LIGHTS AND TIDES.—FRANCE.

1.	2.	3.	4.	5.	6.		7.	8.	9.	
					Position.					
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.	
		Miles	Feet.		° N.	° W.		H. M.	Ft.	
Tréguier River.	1 F. <i>Red.</i>	7	105	Near the Mill of St. Antoine	-	-	} S.S.E., & v.v., 1531 yds. In one lead into the Grand Pass.	5	32	25
"	1 F.	6	46	On the Harbour Mill	48 51·6	3 8				
SEPT ISLES.	1 F. & Fl. ev. 3 min.	15	184	Ille aux Moines, E. end	48 52·8	3 29·5	} Obscured by Rouzic Island and Eastern end of Bono, when bearing W. $\frac{3}{4}$ S. Usually the eclipses are not total within 6 miles.			
HEAUX DE BREHAT.	1 F.	20	148	N.E. side, les Héaux Ledge	48 54·5	3 5·3			5	45
Brchat Isle.	2 F. <i>Red.</i>	6	67	Paon pt., N.E. extreme; and on Rosedo Hillock, E. side	48 52	2 59·3	} W. $\frac{3}{4}$ S., & v.v., 1768 yards.	5	51	31
		8	90		48 51·5	3 0·4				
Des Saint Quay.	1 F.	10	49	Harbour Island	48 40	2 48·6				
Portrieux.	1 F. <i>Red.</i>	3	29	16 yards from extremity of Pier	48 38·8	2 49·5		6	0	31
Éinic Port.	1 F.	10	36	Penthièvre Mole	48 36·1	2 49·0		6	3	30
Légué Port.	1 F.	10	49	Aigle point	48 32·2	2 43·2				
FREHEL.	1 Rev. ev. $\frac{1}{2}$ min.	22	259	On the Cape	48 41·1	2 19·2	In ordinary weather the eclipses do not appear total within 12 miles distance			
St. Malo.	1 F.	10	33	On the Mole, des Noires	48 38·7	2 1·9		6	5	35
Miquiers Bank Light Vessel.		10	-	S.W. point of Bank	-	-	Expected shortly to be in position.	6	6	35
Cancale, Port of La Houle.	1 F. <i>Red.</i>	6	30	Fenêtre Rock	48 40·3	1 51·2				
GRANVILLE.	1 F. <i>Red.</i>	4	26	New Mole Head, W. side of entr.	48 49·9	1 36·4		6	13	37
"	1 F.	15	154	Granville Rock, or C. Lihou	48 50·1	1 36·9				
CHAUSEY IDS.	1 F. & Fl.; a <i>Red</i> flash ev. 4 min.	17	121	S.E. point	48 52·2	1 49·4	Usually the eclipses are not total within the distance of 10 miles.	6	9	35
Régneville.	1 F.	10	33	Agon point	49 0·5	1 34·9		6	20	35
Sénéquet.	1 F. <i>Red.</i>	10	56	Passage Déroute	49 5·5	1 39·8				
Portbail.	1 F.	8	-	<i>En Amont</i> , on summit of Church Tower	49 20·1	1 42·1	} These two lights, in one, lead into the Port.			
"	1 F. <i>Red.</i>	6	33	<i>En Aval</i> , 353 yds. S.W. $\frac{1}{4}$ S., on point Dune	-	-				
CARTERET.	1 Rev. ev. $\frac{1}{2}$ min	18	262	About 100 yds. E. of the Cape	49 22·4	1 48·5	Eclipses do not appear total within 6 miles.	6	25	31
Diclette.	1 F.	5	23	Jetty Head	49 33·1	1 51·7	} N.W. and S.E. 169 yards. In line lead into the Harbour.			
	1 F. <i>Red.</i>	8	75	Head of Harb.	-	-				
HERSEY.	1 F.	-	-	Gouray Pier-head	-	-	Gas.			
"	1 F.	6	31	St. Helier; on Victoria or New S. Pier	49 10·5	2 7·3				
"	1 F. <i>Red.</i>	3	15	St. Helier; Albert or N. Pier	49 10·6	2 7·2		6	25	30

8. H. W. at F. & C.  
9. Rise of Springs.

H. M. Ft.  
3 32 19

4 14 22

4 49 23

4 53 24

5 15 24



## LIGHTS AND TIDES.—FRANCE

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
JERSEY.	1 F. <i>Blue</i> .	Miles 3	Feet. 17	Old N. Pier	49 10.5	2 7.3		H.	M.	Ft.
"	1 F. <i>Red</i> .	3	46	Upper Pier Road	- -	- -	E. N. E., 680 yards from Victoria Pier.			
"	1 F.	10 to 12	60	Outer extr., Ver- clut Brkwater, St. Catherine's Bay	49 13.3	2 1.2				
GUERNSEY.	1 Rev. ev. 45 s. <i>Red</i> .	12 to 14	100	Hanois, or Hanoveaux Rocks, S.W. Rock	49 26	2 42.2	Visible round the Western horizon.			
"	1 F.	11	34	St. Pierre, S. Pier-head, S. side of entr.	49 27.1	2 32.1	When running into the Harbour bring the light W. N. W.	6	37	26
Alderney.	2 F. <i>Red</i> . Gas	5 to 9	55 25	Braye Harbour; on old Pier & N. E. Corner of Reading Room	49 43.3	2 12.4	S. W. by W. & <i>v. r.</i> , 370 yds. The old Pier light is screened in the direction of all dangers.	6	46	17½
CASQUETS.	3 Rev. ev. 20 s.	15	113 each	Highest of the Casquet Rocks	49 43.3	2 22.7	E. ¼ N., 62 yards; S. W. ¼ W., 46 yards; N. W. ¼ W., 24 yds. A Fog-bell.	6	45	15½
CAPE DE LA HAGUE.	1 F.	20	154	Gros du Raz Rock summit W. ¼ S. ¼ mile from the Cape	49 43.4	1 57.3				
Cherbourg.	1 F.	10	59	Guard House, Fort Querque- ville	49 40.3	1 41.1				
"	1 F. <i>Red</i> .	2	39	Western Head, Breakwater	49 40.5	1 38.9	<i>Temporary.</i>	7	49	17
"	1 F. & Fl. ev. 3 min.	10	66	Central Fort of La Digue	49 40.5	1 37.2				
"	1 F. <i>Green</i> .	2	-	Eastern Head do.	- -	- -				
"	1 F.	10	85	Fort Impérial, Pelée Island	49 40.3	1 35.1				
"	1 F. <i>Red</i> .	3	33	Port de Com- merce, E. Jetty	- -	- -				
Béquet Port.	2 F. <i>White</i> & <i>Red</i> lights	-	30 23	-	- -	- -				
L'vi.	1 F. & Fl. : a. <i>Red</i> Fl. ev. 3 min.	12	115	On the Cape	49 41.7	1 28.5				
BARFLEUR.	1 Rev. ev. ¼ min	22	236	On the Cape	49 41.8	1 16	The eclipses do not appear total within the distance of 12 miles.	8	51	17
"	2 F.	8 9	23 43	S. side of entr. -	- - 49 40.1	- - 1 15.8	} In one gives the direction of the entrance to the Port.			
Saire point.	1 F.	10	36	Reville Redoubt S. W. face	49 35.4	1 13.9		When in one with Cape Barfleur light it shows the E. extent of the dangers near Tatihou Island		
St. Vast La Hougue.	1 F. <i>Red</i> .	5	36	Extr. of Jetty	49 35.2	1 15.6	A Fog-bell.			

LIGHTS AND TIDES.—FRANCE.

43

8.		9.		1.	2.	3.	4.	5.	6.		7.	8.	9.
H. W. at F. & C.	Rise of Springs.	Name of Light.	No. of Lights, Character, &c.						Visibility.	Height of Light above the Sea.			
H.	M.	Pt.							Lat.	Long.		M. H.	Ft.
				Morsaline.	1 F.	10	282	On the Mound	49 34.2	1 19.4			
				St. Marcouf.	1 F.	10	56	Ile du Large	49 29.9	1 8.9		9 55	20
				D'Isigny Port.	1 F.	10	46	<i>Fanal d'amont</i>	49 19.3	1 6.7	} N by E. $\frac{1}{2}$ E., and v. v., 306 yards.		
				"	1 F.	8	23	<i>Fanal d'aval</i>	- - -	- - -			
				Grandcamp.	1 F.	3	26	875 yards W. of Church	49 23.4	1 2.6			
				Port-en-Bessin.	2 F.	} 6	92	<i>Fanal d'aval</i>	49 21	0 45.6	} N.E. by E. and v. v., 79 yards. Lattershown when 12 ft. on bar	8 57	20
					2 F.		6	131	<i>Fanal d'amont</i>	- - -		- - -	
6	37	26		POINTE DE VER.	1 F. & Fl. ev. 4 min.	15	138	On the slope of a small hill, 800 yds. from the sea	49 20.5	0 31.2	Flash is preceded and followed by a short eclipse beyond 6 miles.		
6	46	17 $\frac{1}{2}$		Courceulles.	1 F.	6	30	W. Jetty Head	49 20.3	0 27.5		9 7	20
6	45	15 $\frac{1}{2}$		L'Orne River.	2 F.	10	92	<i>Fanal d'amont</i> , on the Church Tower, d'Oyes- treham	49 16.6	0 15.6	} West side of entrance. In one point out the entrance of the channel into the river Orné.		
				"		4	39	<i>Fanal d'aval</i> near the Re- doubt d'Oyes- treham	49 17.1	0 15			
				"	1 F. <i>Red.</i>	2	-	Near extr. of N. end, W. Jetty	- - -	- - -	Shows from 3 hours before to same after H.W. <i>Temporary.</i>		
7	49	17		"	1 F. <i>Green.</i>	2	25	East Jetty	49 17.1	0 14.8			
				Touques River, or Tronville.	2 F.	} 6	33	<i>Fanal d'amont</i>	49 21.7	0 4.7	} 153 yards apart. In one gives the direction of the Chan. of Trouville. Latter shows when 7 feet on bar.		
				"	1 F. <i>Green.</i>		6	20	<i>Fanal d'aval</i>	- - -		- - -	
				"	1 F. <i>Green.</i>	2	25	N. part, E. Jetty	- - -	- - -			
				RIVER SEINE.									
				HONFLEUR	1 F. <i>Red.</i>	6	29	New E. Jetty	- - -	- - -	Shows when 6 $\frac{1}{2}$ feet at entrance.	9 29	23 $\frac{1}{2}$
				"	1 F.	15	82	Hospital Jetty, N.W. extremity of Town	49 25.5	0 13.6			
				FATOUVILLE.	1 F. & Flsh.; a <i>Red</i> Flsh. ev. 3 min.	20	420	On the Heights	49 24.9	0 19.4			
8	51	17		Berville.	1 F.	8	-	N. of the Church	- - -	- - -			
				La Roque.	1 F.	8	-	On the pt., near the Hermitage	- - -	- - -			
				Quillebœuf.	1 F.	10	42	N. extremity of Quillebœuf Quay	49 28.5	0 31.9		10 6	9 $\frac{1}{2}$
				"	1 F. <i>Red.</i>	3	-	N. part of Mole	- - -	- - -			
				Courval.	1 F.	3	-	3 $\frac{1}{2}$ miles above Quillebœuf It.	- - -	- - -			
				D'Aizier.	1 F.	4	20	Near the Church	- - -	- - -			
				Vaquerie.	1 F.	3	20	1 $\frac{1}{2}$ miles above Aizier Church	- - -	- - -			

## LIGHTS AND TIDES.—FRANCE.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Caudebecquet.	1 F.	Miles 3	Feet. -	1321 yards east- ward of Caude- bec Church	N. -	E. -		H. M.	Ft.
Villequier.	1 F.	3	-	W. of Vatteville Church, 1 mile	-	-			
Mesnil.	1 F.	4	23	-	-	-			
Tancarville.	1 F.	8	-	On the point	-	-			
Hode.	1 F.	8	-	On the point	-	-			
Hoc.	1 F.	10	39	On the point, N. bank	49 28.8	0 11.2			
HAVRE.	1 F.	10	39	N.W. Jetty	49 29	0 6.1	A Fog-bell. Coloured glasses have been so arranged in a lantern, on the quay of the outer harbour, as to lead up to Francois Tower.	9 51	22
"	1 F. <i>Orange.</i>	3	23	S.E. Pier	-	-			
LA HEVE.	2 F.	20	397	On the summit of the Cape	49 30.7 S.W. Tower	0 4	N.E. $\frac{1}{2}$ N., & v.v., 69 yards.		
FECAMP.	1 F.	20	426	Pagnet point	49 46.1	0 22.1			
Fécamp Harbour	1 F. & Flsh. ev. 3 min. <i>Red.</i>	10	39	N. Jetty, 38 yards from ex- tremity	49 45.9	0 21.1	Shows when 10 feet water in Chan.	10 44	23 $\frac{1}{2}$
"	1 F. <i>Red.</i>	3	29	S. Jetty	-	-			
St. Valery-en- Caux.	1 F.	6	29	W. Jetty, 72 yds. from Head	49 52.4	0 42.5	Shows when 8 $\frac{1}{2}$ feet water in Chan.	10 46	27
"	1 F. <i>Red.</i>	3	24	Extreme of E. Jetty	49 52.4	0 42.5			
Ailly.	1 Rev. ev. min.	27	305	On the point	49 55.1	0 57.5	Eclipses not total within 10 miles.		
Dieppe.	1 F.	10	39	W. Mole, 38 yds. from Head	49 56	1 4.9	When 10 $\frac{1}{2}$ feet water in the pas- sage.	11 6	27
"	3 F.	4	23	E. Mole, 11 yds. from Head	-	-	1. Lighted all night.		
			31	-	-	-	2. From 2 $\frac{1}{2}$ hours before till 2 hours after H.W.		
			27	-	-	-	3. Between the two former— lighted 2 hours before H.W., and at H.W. is extinguished. The two latter are not lighted when the weather prevents all access to the Port. For the guidance of vessels the mast supporting the lights is kept vertical while the vessel pre- serves her proper course; but should she deviate the mast is inclined to that side towards which she ought to steer. Vessels desirous of profiting by these signals should show two lights, one forward and one aft.		
Treport.	<i>Red.</i>	3	-	E. Jetty, ex- tremity	-	-		11	27
"	1 F.	10	36	W. Mole, 25 yds. from Head	50 3.9	1 22.1	Shows when 6 $\frac{1}{2}$ ft. water in Chan.		

1.  
Name  
Light

SOMME R  
Cayeux.

CAYEUX.

"

Crotoy.

Hautbane  
Bereck

ETAPLES,  
CANCHE

"

ALPRECK

Boulogne

"

GRISNEZ

CALAIS.

"

Walde.

GRAVELIN

"

Dunkerque

LIGHTS AND TIDES.—FRANCE.

8. H. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
		SOMME RIVER. Cayeux.	1 F.	4	-	812 yds. S.W. of Cayeux It.	50 10.2	1 29	From 3¼ hours after flood-tide to 1¼ hours after ebb, to point out the S. Channel of the Somme. The bright flashes are preceded and followed by short eclipses. When 2 feet water at entrance.			
		CAVEUX.	1 F. & Fl. ev. 4 min.	15	02	La Somme R. S. side entr.	50 11.7	1 30.7		11 15	27½	
		"	1 F.	4	-	Pointe du Hour- del, S. side of entrance	50 12.9	1 33.9				
		Crotoy.	1 F.	4	-	N. side entrance	50 12.9	1 37.3	When 3 feet water at entrance.			
		Hautbane of Berck	1 F.	10	66	N. side, Mouth of l'Authie River	50 24	1 33.5				
		ETAPLES, OR CANCHE RIVER.	2 F.	20	174 each	Touquet, south side of entr.	50 31.4	1 35.5	N.N.E. and S.S.W., 273 yards.			
		"	1 F.	6	52	Lornel point, N. side of entr.	50 33.6	1 34.6				
		ALPRECK POINT	1 F. & Fl. ; a Red flash ev. 2 min.	12	161	2¼ miles S.W. of Boulogne	50 41.9	1 33.7	Flash preceded and followed by short eclipses.			
		Boulogne	2 F. Vertical.	9	43 33	S.W. Jetty Head	50 43.9	1 35.1	High light from 9½ feet flood to 9½ feet ebb; low light from H.W. to 9 feet ebb	11 25	25	
		"	1 F. Red.	4	46	N.E. Jetty, near extremity	- -	- -	From 9½ feet flood to 9½ feet ebb.			
		GRISNEZ	1 Rev. ev. ½ min	22	226	¼ mile S. of the Cape	50 52.2	1 34.9	Eclipses not total within 12 miles.	11 27	21½	
		CALAIS.	1 F. Red.	2	16	Extreme of W. Jetty	- -	- -		11 49	19½	
		"	1 F.	9	39	Extreme of E. Jetty	- -	- -	When 8 feet water in entrance.			
		"	1 F. & Fl. ev. 4 min.	20	190	On a Tower in the old fortifi- cations	50 57.7	1 51.1	Eclipses not total within 12 miles.			
		Walde.	1 F. & Fl. ; a Red flash ev. 20 s.	10	34	On the point	50 59.8	1 55.1				
		GRAVELINES.	1 F.	15	95	Fort Philippe, E. side of entr.	51 0.3	2 6.5	} 65 yards apart.			
		"	2 F.	6	20	S.W. Mole of Fort Philippe	51 0.3	2 6.2		12 0	19	
		Dunkerque.	1 F.	5 to 12 or 15	85	Tour de Heug- uenar, S. by S. ½ E., 2406 yds from entr.	- -	- -	This light, specially intended for the Channel between the Tour de Heuguenar and the entrance of the Jetties, shows its brightest in that direction, N. by W. ½ W.			
		"	1 F. Red.	3	28	W. Mole Head	- -	- -				
		"	1 Rev. ev. min.	24	194	Pier-head, 875 yards S. by E. ¼ E. from the entrance	51 3	2 22.6	Eclipses not total within 12 miles.	12 8	16½	
		"	1 F. Green.	3	26	Entr. of Jetty, E. of Port	51 3.4	2 21.5				

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5 Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
Dunkerque.	1 Rev. ev. 30 s. <i>Red.</i>	10	33	Raytingen, Lt. V., in 4½ fms.	N. °, 51 3 3	E. °, 2 7 8	This and Marlyek floating light in one lead to Dunkerque Road.	H.	M.	Ft.
„	1 F. <i>Red.</i>	6	33	Marlyek, Lt. V. in 5 fathoms	51 3 6	2 14 2				

## FRANCE.—W. COAST.

					N.		W.				
Conquet Port.	1 F.	12	72	Kermorvan pt.	48 21 7	4 47 5	-	-	3 46	21	
St. MATHIEU.	1 Rev. ev. ¼ min.	18	177	On the point	48 19 8	4 46 4	Eclipses not total within 8 miles.				
BREST CHANNEL.	1 F.	15	105	Minon point	48 29 2	4 37					
„	1 F. & Fl. ev. 3 min.	18	184	Portzic Point	48 21 5	4 32 2	Flash preceded and followed by a short eclipse.		3 47	19	
„	1 F.	10	226	E. Coast, Cama- ret Bay, Capu- cins point	48 19 2	4 34 3	When kept in sight clears all dangers.				
„	1 F. <i>Red.</i>	5	161	Toulinguet pt.	48 16 8	4 37 9					
Douarnenez Bay.	1 F.	10	114	Tristan Ile	48 6 2	4 20 4					
ILE DE SEIN.	1 F. & Fl. ev. 4 min.	20	148	N. pt. of Island	48 2 7	4 52 1	Eclipses not total within 12 miles.		3 21	17½	
Raz de Sein.	1 F.	-	-	On Ile Tévénee	-	-	<i>Proposed.</i>				
„	1 F.	-	-	On Diamond Rock	-	-	<i>Proposed.</i>				
BEC DU RAZ.	1 F.	20	259	Highest part	48 2 4	4 44					
Audierne Port.	1 F. <i>Red.</i>	5	36	Extremity of Jetty, Raoulie point	48 0 6	4 32 5	} N. E. ¼ N. & r. r., 1203 yds. lts. in one lead clear of the Gamelle shoal.				
„	1 F.	12	69	Near the Capu- chin garden	-	-					
PENMARCH PT.	1 Rev. ev. ¼ min.	22	135	Near St. Pierre Church	47 47 9	4 22 6	Eclipses not total within 10 miles.		3 16		
Loctudy	1 F.	10	36	Pont l'Abbé,	47 49 9	4 9 4					
Odet.	2 F.	7 9	33	Coq pt., E. entr.	47 52 3	4 6 8	N. ¾ E. & r. r., 291 yards. The southern lt. is <i>Red.</i> , and both lts. kept in one lead into the entr. of the Odet Channel.				
PENFRET	1 F. & Fl. ev. 4 min.	15	118	N. pt. of Island	47 43 3	3 57 3	Eclipses not total within 6 miles.				
CONCARNEAU.	2 F.	9 12	46 177	Croix Battery, and between Concarneau & Beuzec	47 52 2	3 55 2	N. E. ¼ E. & r. r., 2052 yards. These lts. point out the direction of Concarneau Road.		3 12	13	
Lahrie.	1 F. <i>Red.</i>	7	43	E. shore of Port Concarneau	47 52	3 54 7	Visible 19° only, which clears all dangers.				
Douélan Port.	2 F.	8	82 118	E. and W. sides of entrance	-	-	356 yards apart.				
ILE DE GROIX.	1 F.	20	194	N. W. part of the Island	47 38 9	3 30 7					
„	1 F. & Fl. a <i>Red</i> flash ev. 3 min.	10	171	Fort de la Croix, E. part of Id.	47 38 1	3 25 2					

LIGHTS AND TIDES.—FRANCE.

1.	2.	3.	4.	5.	6.		7.	8.	9.	
					Position.					
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.	
M.	Ft.	Miles	Fcet.		N.	W.		H. M.	Ft.	
L'ORIENT.	1 F.	10	148	L'Orient Church Tower	47 44.9	3 21.5	N. N. E. $\frac{1}{4}$ E., & <i>v. v.</i> , 1960 yards. Lights in one lead into the Eastern or Little Passage, or Passe de Gâvre.	3 18	14 $\frac{1}{2}$	
"	1 F.	12	75	La Perrière Bank	47 43.9	3 21.8				
"	2 F.	8 12	20 62	Port Louis, Grand Passe, Eastern side	47 42.2	3 21.2				
BELLE ILE. Sanzon Port.	1 F. <i>Red.</i>	5	30	Extremity of the Mole	47 22.4	3 13.2	E. $\frac{1}{4}$ N., & <i>v. v.</i> , 1826 yds. Lights in one lead into the Western or Great Passage to Port Louis.	3 42	13	
Palais Port.	1 F.	9	30	Mole Head, S. side of entr.	47 20.9	3 9.3				
GOULFAR BAY.	1 Rev. ev. min.	27	276	S. W. part of the Island.	47 18.7	3 13.7				Eclipses not total within 10 miles.
Maedik.	1 F.	10	85	601 yds. W. from E. pt. of Id.	47 20.5	2 52.2				
Teignouse, Quiberon Bay.	1 F. & Fl. ev. 3 min.	12	59	On the summit	47 27.4	3 2.8				
Port Haliguen, Quiberon Bay.	1 F.	10	40	On a Tower, N. Jetty	47 29.2	3 6.2				
Etel.	1 F. <i>Red.</i>	4	20	Entr. of River	47 38.7	3 12.9				N. by E., & <i>v. v.</i> , 574 yds. S. It. <i>Red.</i> In one they lead into the River Crae'h
La Crae'h.	2 F.	7 9	29 69	Left Bank of River	47 34.1	3 0.4				
Navalo Port. Penlan.	1 F. 1 F.	15 10	72 52	On the point On the point	47 32.9 47 31	2 54 2 30.2				
LE FOUR. Ouaisic.	1 Rev. ev. $\frac{1}{4}$ min. 2 F.	18 6 6	79 13 33	On the Rock On the shore, 492 yds. N. $\frac{1}{4}$ W. of the Church	47 17.9 47 18	2 38.1 2 30.9				Eclipses not total within 8 miles. N. and S. 50 yards. Lights in one give the direction of the Channel, but lead very near the two rocks, S. $\frac{1}{4}$ E. of the Trehic beacon, which uncover at L. W.
Plateau de la Banche.	1 F. <i>Red.</i>	10	70	Entrance to the Loire	47 10.6	2 27.2	This light marks the Channel of the town of St. Martin.	3 10	15 $\frac{1}{2}$	
RIVER LOIRE.	1 F. <i>Red.</i>	6	102	Summit of pt. l'Éve	47 14.5	2 16.1				
"	1 F.	15	121	<i>Feu d'Aval</i> , on Aiguillon Tower	47 14.5	2 15.9				
"	1 F. & Fl. ev. 2 min.	15	190	<i>Feu d'Amont</i> , on Commerce T.	47 15.4	2 15				
"	1 Rev. ev. $\frac{1}{2}$ min. <i>Red.</i>	12	33	Ville-ès, Martin point	47 15.4	2 13.7				Eclipses not total within 4 miles. When this It. is in one with St. Nazaire light keep on that line until Aiguillon and Point l'Éve lights are in one, which will lead just southward of the <i>black bell</i> buoy on Ville-ès Martin shoal
"	1 F.	8	26	St. Nazaire, New Mole Head	47 16.3	2 11.9				
"	1 F.	8	26	Paimboeuf Port, extremity of the Mole	47 16.4	2 2				
"	1 F. 1 F. <i>Red.</i>	- -	- -	Pierre à l'Œil St. Nicholas Isle	- -	- -				<i>Proposed.</i> <i>Proposed.</i>

## LIGHTS AND TIDES.—FRANCE.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
RIVER LOIRE.	1 F.	Miles	Feet.	Mindin point	° N.	° W.	<i>Proposed.</i>	H.	M.	Ft.
Pornic.	1 F.	9	59	Novellaud pt.	47 6.6	2 7				
PILIER.	1 F. & Fl. ev. 4 min.	18	105	N.W. pt. of Id.	47 2.6	2 21.7				
ILE D'YEU.	1 F.	20	177	On Mound, 1860 yards from N. pt. of Island	46 43.1	2 23		3	6	14
Breton Port.	1 F.	8	23	Outer Jetty Head, N. side of entrance	46 43.6	2 21	} Lights (284 yards apart) in one mark the direction of the Channel into Port Breton.			
"	1 F.	10	49	Head of Harbour	-	-				
Corbeaux.	1 F. <i>Red.</i>	5	64	On the point	46 41.5	2 17.2				
St. Gilles-sur-vie.	1 F. <i>Red.</i>	5	39	Extremity of N. side of Jetty	46 41.8	1 56.9				
LA CHAUME.	1 F.	12	118	W. side, entr. of Sables d'Olonne Port	46 29.7	1 47.8	} Lights in one mark the direction of the Great Channel.			
Les Sables d'Olonne.	1 F.	8	23	Jetty Head, E. side of entr.	46 29.5	1 47.6			3	26
Barges d'Olonne.	1 F. & Fl. <i>A Red Flash ev. 3 min.</i>	15	75	On the Grand Bank	46 29.7	1 50.7				
Roche Bonne Light Vesseel.	-	-	-	-	-	-	<i>Proposed.</i>			
Pertuis Breton.	1 F.	10	59	Grouin du Cou point	46 20.8	1 28.0				
"	1 F.	10	33	Aiguillon point	46 16.2	1 19.8	The light will probably be moved nearer the point			
ILE DE RE.	1 Rev. ev. 4 min.	22	164	N.W. point	46 14.7	1 33.8	} Eclipses not total within 10 miles. The dangers extend more than a mile to seaward of light-house.			
BALEINES.	1 F.	15	72	On the shoal	46 15.8	1 35.3				
HAUT-BANC DU NORD.	1 F.									
St. Martin Port.	1 F. <i>Red.</i>		52	On salient angle of Demi Bastion, 109 yds. E. of entrance	46 12.4	1 21.9				
Port de la Flotte.	1 F.	9	30	On the New Mole	46 11.3	1 19.4				
CHAUVEAU Pr.	1 F.	14	72	S.E. point	46 8	1 16.5				
Rochelle Harb.	1 F.	10	79	<i>Fanal d'Amont,</i> On E. Quay	46 9.4	1 9.1	} W. 3 S., & e.e., 257 yards. Lights in one lead into the Harbour.	3	31	17
"	1 F. <i>Red.</i>	8	46	<i>Fanal d'Arret</i>	-	-				
ILE D'AIX.	1 F.	10	56	On Fort at S. point of Island	46 0.6	1 10.8		3	20	17
ILE D'OLERON.	1 F.	20	164	N.W. point	46 2.8	1 24.7				
GLASSIRON.	1 F.	4	20	Extremity of Jetty	45 58.2	1 13.9				
La Perotine.	1 F.									
Château Port.	2 F.	8	30	E. part	45 53	1 11.2	In one lead into the Port.			
RIVER GIRONDE.			60							
Coubre Point.	1 F.	15	121	N. side of entr.	45 41.5	1 15.4				
Falaise.	1 F. <i>Red.</i>	10	46	601 yards of Terre Negre	45 38.9	1 6.9				
Terre Nègre.	1 F.	14	118	On the Tower	45 38.8	1 6.5				

1. Name of Light.
RIVER GIRONDE.
containing Pontillae.
Royan.
CORDOUAN.
DE GRAVE.
St. George Suzac.
Talais Bay Light V.
Richard.
Tour de Bay.
Mapon Lt. in 18 fms.
Gact.
Patras He.
Pauillae.
"
Port de B.
BOURIN.
ARCACHON.
COSTIS.
Adour Riv.
BIARRITZ.
Socoa Por.
Fuenterria Bidassoa.
PASAGES.
SAN SEBA.

LIGHTS AND TIDES.—SPAIN.

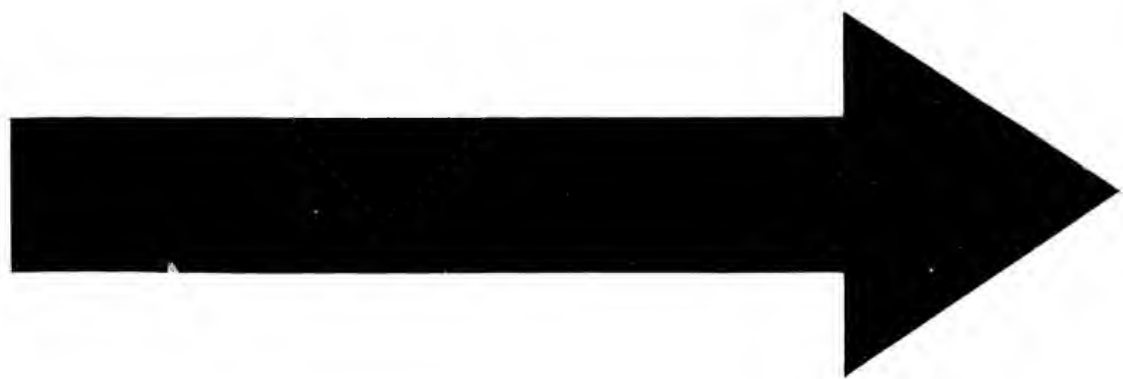
49

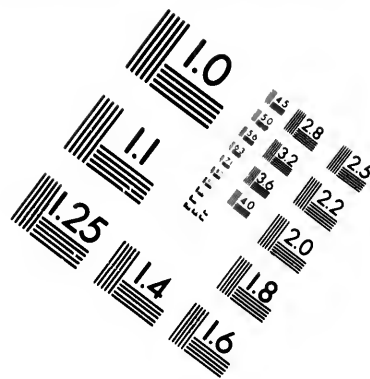
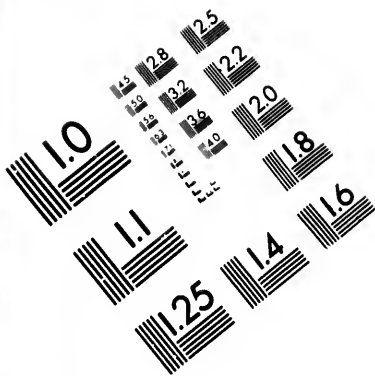
8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at E. & C.			9. Rise of Springs.
							Lat.	Long.		H.	M.	ft.	
		RIVER GIRONDE continued—		Miles	Feet.		N.	W.		H.	M.	ft.	
		Pontailiac.	1 Alt. ev. 20 s. <i>Red or White</i>	15	177	On the Table Land	45 38.2	1 3.7	This light points out the northern Passe to the Embouchure of the Gironde. In changing colour there is no intervening eclipse.				
		Boyan.	1 F.	6	36	152 yards from end of Jetty	45 37.1	1 1.9		3	35	13½	
6	14½	CORDOUAN.	1 Rev. ev. min.	27	194	On the Rock	45 35.2	1 10.5	Light does not quite disappear within 10 miles. <i>Red</i> from N. by E. & E. to E. by S.	3	37	13½	
		DE GRAVE.	1 F. & 1 Flash	15	85	S. pt. of entr.	45 34.0	1.1	<i>Flashing</i> Lt. with short eclipses ev. 7s., in the direction of Talais lt., and in the S. pass of the Gironde. <i>Flashed</i> light in the direction of the North pass.				
		St. George.	1 F. <i>Red.</i>	12	44	On the point	45 35						
		Suzac.	1 F. <i>Red.</i>	12	121	On the hills	45 35.4	0 58.9	A Fog-bell.				
		Tala's Bank Light Vessel.	1 F.	10	33	On the bank, in 4 fathoms	45 30.7	0 59.2					
		Richard.	1 F. <i>Red.</i>	10	56	S. side of River	45 26.4	0 56.0					
		Tour de By LL V	1 F.	10	33		45 23.7	0 49.3					
		Mapon Lt. V., in 18 feet.	1 F.	9	33		45 17.6	0 45.9					
26	14	Guet.	1 F. <i>Red.</i>	2	20		45 12.4	0 44.9					
		Patras Ile.	1 Flsh.	13	43	N. point	45 12.4	0 43	Eclipses every 4 seconds.				
		Pauillac.	1 Alt. <i>Red</i> and <i>White</i>	4	20	Landing place, W. side of River	45 11.9	0 44.8	There is also a F. light at outer end of landing place.				
		"	1 F.	5	23	Trompeloup Chapel	45 13.5	0 45	To indicate the anchorage off Pauillac.				
		Port de Blaye.	1 F.	4	16	E. side of River, at the landing place	45 7.4	0 40.1					
		HOURTIN.	2 F.	20	177	Between the Gironde and C. Ferret	45 8.3	1 9.9	219 yards apart.				
		ARCACHON BASIN	1 F.	20	167	C. Ferret, N. side of entr.	44 28.7	1 15.1		4	37	11½	
		CONTIS.	1 Rev. ; a flash ev. ½ min.	24	164	Sand hill	44 5.7	1 19.6					
		Adour River.	1 F.	6	36	S. Jetty, on a platform	43 31.8	1 31.5	To be moved as the work pro- gresses.				
31	17	BIARRITZ.	1 Rev. ev. 20 s.	22	240	St. Martin pt., 2½ miles S.W. of Adour River	43 29.6	1 33.3	Alternately a <i>White</i> and <i>Red</i> flash. Eclipses not total within 12 miles.				
20	17	SUCOR PORT.	1 F.	10	115	W. pt., St. Jean de Luz Bay	43 23.7	1 41.3		3	19	12½	

SPAIN.—NORTH AND WEST COASTS.

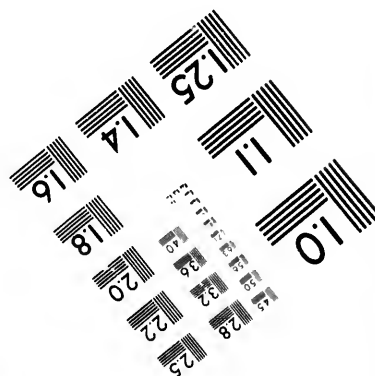
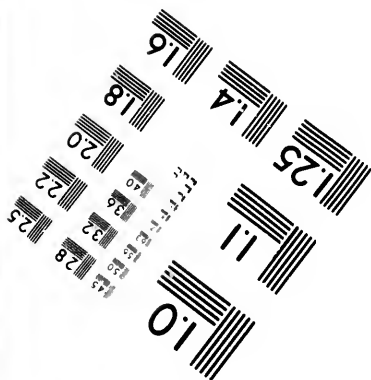
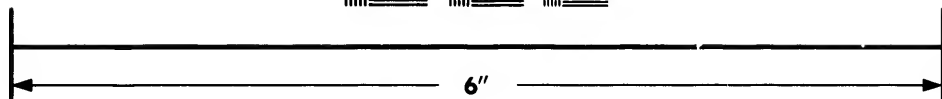
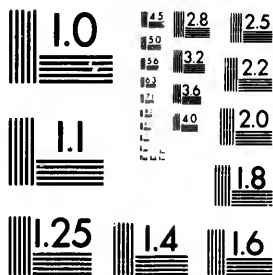
Fuenterrabia, Bidasoa River.	1 F.	7	285	Cape La Higiera	43 23.6	1 47							
PASAGES.	1 F.	14	486	Cape La Plata, near the W. entrance	43 20.3	1 56.5							
SAN SEBASTIAN.	1 F. and Fl. ev. 2 min.	15	431	Mount Igueldo, W. side	43 19.5	2 0.4				3	0	12	





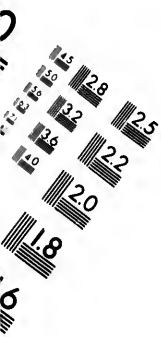


**IMAGE EVALUATION  
TEST TARGET (MT-3)**



**Photographic  
Sciences  
Corporation**

23 WEST MAIN STREET  
WEBSTER, N.Y. 14580  
(716) 872-4503



## LIGHTS AND TIDES.—SPAIN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H. M.	Ft.	
SAN SEBASTIAN.	1 F.	Miles 9	Feet. 171	Santa Clara Id., summit	43 19·5	1 50·6	Do not bring the light westward of South. Rises from the centre of keeper's dwelling.			
Guetaria.	1 F.	10	295	N. Peak of Id.	43 19·1	2 13·1				
Lequeitio.	1 F.	10	148	Santa Catalina de Lequeitio pt.	43 23·4	2 33·5				
MACHICHACO.	1 F. and Fl. ev. 4 min.	18	260	On the Cape	43 28	2 49·4				
Bilbao.	1 F.	10	380	Point Galea, on the Fort	43 22·6	3 4		3 0 13		
Castro Urdiales.	1 F. and Fl.; a <i>Red</i> flash ev. 3 min.	7	131	Santa Ana Castle, S.E. Tower	43 24·2	3 16·1				
SANTONA.	1 F. <i>Red</i> .	10	85	Caballo point	43 28·2	3 27·2	Visible from S. by W. round W. to N. by E. $\frac{3}{4}$ E.	3 30	12 $\frac{1}{2}$	
"	1 F. and Fl. ev. 3 min.	17	126	Pescador point	43 28·6	3 28				
SANTANDER.	1 F.	12	141	Isla de Mouro, 14 yds. from the N. shore	43 28·6	3 45·7	Illumines an arc of 270° seaward. Corbera or Corvera Rock, and a bank of 3 feet water, lies S.E. by E. $\frac{1}{4}$ E. 112 fathoms; and W. by S. 140 fathoms from the light-house.			
"	1 F. <i>Red</i> .	3	33	S.W. angle of the Capitania, 2 yards from edge of Pier	-	-		3 30	15	
"	1 Rev ev. min.	24	298	Cape Mayor, $1\frac{1}{2}$ miles from the entrance of the Port	43 30·2	3 47·1	Eclipses not total within 8 miles. A <i>blue</i> flag indicates that tug- steamers cannot proceed to sea.			
Shaneca.	1 F.	7	118	Punta del Torco de Afuera, W. side	43 26·8	4 0·9				
Llanes.	1 F.	9	64	San Antonio, South point	43 26·7	4 45·5				
RIVADESELLA.	1 F. and Fl. ev. 4 min.	17	370	Mt. Somos, W. entr. of river	43 28·7	5 7·3	Illumines 167°.			
Tina Mayor.	1 F.	15	223	San Emeterio point	43 25·2	4 34·3				
Villaviciosa	1 F.	7	220	Tazones point	43 35·2	5 22·9				
GIJON.	1 F.	10	167	Vicinity of Santa Catalina Her- mitage	43 35·2	5 38		3 15	15	
PENAS.	1 Rev. ev. $\frac{1}{4}$ min.	21	338	On the Cape	43 42·3	5 49·8				
Aviles.	1 F.	10	130	Castillo point, N. side of entr.	43 38·1	5 56				
Cudillero.	1 F.	10	94	Point Revallera	43 36·2	6 9				
BCSTO.	1 F. a <i>Red</i> flash ev. 2 min.	12	307	On the Cape	43 36·2	6 28·8				
Luarca.	1 F.	7	177	La Blanca pt.	43 34·5	6 32·9				
TAPIA ISLET.	1 F. and Fl. ev. 2 min.	15	93	On the summit	43 35·6	6 58·4				
Pancha Isle, near Ribadeo	1 F.	9	79	On the Island	43 34·7	7 4·2				

1. Name Light
San Ciprian
Barquero
ESTACA.
Cedeiro.
Prior.
Chico Prior
FERROL
CORUNA.
"
SIBARGAS ISLANDS.
Camarinas.
FINISTERRA
Cé.
Muros Bay
CORROBEDO
Salvora Isl
Arosa Isla
Oms Island
BAYONA O ISLANDS
Vigo.
SILLEIRO
Povoa de
OPORTO.
Aveiro.
MONDEGO
BERLENG.

LIGHTS AND TIDES.—PORTUGAL.

51

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
							Lat.	Long.		H.	M.	Ft.	
		San Ciprian	1 F.	Miles 9	Feet. 121	Punta de la Atalaya	43 43	7 28.5		H.	M.	Ft.	
		Barquero	1 F.	9	273	Conejera Island	43 45.6	7 40.3	-	3	0	15	
		ESTACA.	1 Rev. ev. min.	20	307	On the point	43 47.5	7 43.4	-				
		Cedreiro.	1 F.	9	88	Robaleira pt., S.W. of the town	43 39	8 5.4	-	3	0	15	
3	0	PRIOR.	1 F.	15	448	N. part of Palma Cape	43 33.7	8 19.1					
		Chico Priorino.	1 F. & Red Flsh. ev. 2 min.	11	92	On the Cape	43 27.8	8 20.5					
		FERROL	1 F. Red.	8	38	110 yds. E. of la Palma Castle,	43 27.7	8 16.1	-	3	0	15	
			1 F.	4 or 5	23	Mercantile Wharf	43 28.7	8 15.5					
		CORUNA.	1 F. and Fl. ev. 3 min.	12	331	Hercules Tower	43 23	8 24.1	The flash is seen 20 miles.	3	0	15	
		"	1 F.	10	56	Platform, St. Antonio Castle	43 22	8 23.1					
		SINARGAS ISLANDS.	1 F. & Red Flsh. ev. 4 min.	11	358	Second N. Peak, Isla Mayor	43 21.8	8 50.2					
		Camarinas.	1 F.	10	225	Cape Villano	43 9.8	9 13	-	3	0	15	
		FINISTERRE.	1 Rev. ev. ½ min.	20	468	S. point of the Cape	42 52.6	9 15.4	-	3	0		
		Cé.	1 F. Red.	8	82	On the Cape, 36 yards from extremity.	42 54.8	9 10.1					
		Muros Bay.	1 F.	10	89	Queijal point of Monte Louro	42 44.2	9 4					
		CORROBEDO.	1 F.	12	103	On the Cape	42 34.6	9 4.8					
		Salvora Island.	1 F. & Red Flsh. ev. 2 min.	16	82	S. point	42 27.8	9 0.4					
		Arosa Island.	1 F.	7	38	N.W. or Caballo point	42 34.1	8 52					
		Ons Island.	1 F. and Fl. ev. 2 min.	12	421	1½ miles from North point	42 22.5	8 55.1	N. side of entrance to Pontevedra Bay				
		BAYONA OF CIES ISLANDS.	1 Rev. ev. min.	20	595	Middle Island, Mount Faro	42 12.4	8 54.1					
		Vigo.	1 F. and Fl. ev. 3 min.	7	102	La Guia Castle, 1½ miles N.E. of Vigo	42 15.1	8 41	The flash is seen 12 miles.	3	0	12	
		SILLEIRO CAPE.	1 F.	17	72	S. point	42 6.1	8 52.6					

PORTUGAL.

Povoa de Varzim	1 Rev.	-	-	100 ft. in shore	41 24	8 37	Lighted occasionally, when the fishing boats are at sea.					
OPORTO.	1 F.	20	220	Nossa Senhora da Luz	41 9.1	8 37.2	A bad light.	2	30	10		
Aveiro.		-	-	On the Pier, S. side	40 39	8 43	Proposed.					
MONDEGO.	1 F.	20	330	On the Cape	40 12	8 55.2		2	30	7		
BERLENGAS	1 Rev. ev. 3 min.	25	365	Great Berlenga Island	39 25	9 30.3						

## LIGHTS AND TIDES.—SPAIN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
CARVOEIRO.	1 F.	Miles 15	Feet. 182	Highest part of Cape	° N. , 39 21.1	° W. , 9 24.3.		H.	M.	Ft.
ROCA.	1 Rev. ev. 1½ min. <i>Red and White</i>	21	598	N. E. of Cape, nearly ¼ mile	38 46	9 30				
RIVER TAGUS. Guia.	1 F.	12	207	Nossa Senhora da Guia	38 41	9 27.2				
San Julian.	1 F.	12	128	In the Fort	38 39.7	9 20				
BUGIO.	1 Rev. ev. 1½ min.	16	110	Tower of Lorenzo	38 39	9 18.1				
Belem.	1 F. <i>Red.</i>	6	30	In a Fort near the Castle	38 40.8	9 17.7	- - - -	2	30	12
ESPICHEL.	1 F.	12	627	On the Cape	38 24.1	9 13				
SETUVAL, OF SAINT UBES.	1 F.	15	490	Near Fort d'Outao, W. entr. of Harb.	38 31.1	8 53	- - - -	2	30	8
CAPE SAN VICENTE.	1 Rev. ev. 2 min.	20	220	On the Convent	37 3	9 0				
SANTA MARIA.	1 F.	15	109	On the Cape	38 56	7 46				

## SPAIN.—SOUTH COAST.

Ayamonte, Guadiana River	2 F. <i>Red.</i>	8	22 21	Canela Island	37 10.5	7 16.6	Shifted as the bar alters.			
"	2 F. <i>Green.</i>	7	26 16	Cristina Isle, E. side of entr.	37 10.7	7 13.7				
Cartaya.	1 F. & Fl. ev. 4 min.	14	79	Rompedo de Cartaya, Las Pedras River	37 11.8	7 1.1				
Huelva, Odeil River.	2 F.	8	27 16	Punta del Padre Santo, E. side	37 7.5	6 47.4				
Guadalquivir River.	1 F.	8	72	Chipiona Church Tower	36 44.2	6 25.8	<i>Temporary.</i> The Salmelina shoal lies W. by N. ¼ N. 1¼ miles from the Church Tower.			
"	1 F. <i>Red.</i>	-	-	Espiritu Santo	36 47.2	6 22.7				
"	1 F.	6	36	Malandar point	36 46.3	6 21.9				
"	1 F.	-	-	Salmelina Rocks	36 44	6 27	<i>Building.</i>			
"	1 F.	7	52	Bonanza	36 47.9	6 20.4				
CADIZ.	1 F. & Fl. ev. 2 min.	20	146	San Sebastian, W. Tower	36 31.2	6 18.9	Alternate flashes of <i>White &amp; Red.</i>	1	45	9½
TRAFALGAR.	1 Rev. ev. ¼ min.	19	168	Extreme part of the Cape	36 10.5	6 1.3				
TARIFA.	1 F.	20	152	On the Island, S. of the town	36 0	5 36.6		1	46	6
Algeciras.	1 F.	9	62	Isla Verde	36 7.3	5 26.1				
GIBRALTAR.	1 F.	15	150	Victoria Tower, EUROPA PT.	36 6	5 21	A strip of <i>Red</i> light is shown in the direction of the Pearl Rock, between N.E. by E. ¾ E. and E. ¼ N.			

LIGHTS AND TIDES.—SPAIN.

53

8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Feet.		° N.	° W.		H. M.	Ft.
		GIBALTAR.	1 F. <i>Temporary</i>	-	-	New Mole ex- tension, South	-	-	<i>Red S., White W., Green N.</i> The Pier should not be approached whilst the <i>Red</i> position of the light is visible, nor enter the Mole until the <i>Green</i> light is in sight. Give the Pier-head a wide berth.		
		"	1 F. <i>Green.</i>	-	-	Ragged Staff, Landing Place	-	-	Gas.		
30	12	"	1 F. <i>Red.</i>	-	-	Old Mole Head, North	-	-			
30	8	"	1 F. <i>Red.</i>	-	-	South Mole					

45 9½

46 6

THE  
**MEDITERRANEAN SEA.**

COAST OF SPAIN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Doncella.	1 F. & Fl. ev. 4 min.	Miles 12	Fect. 59	On the point	N. ° 36 24' 3	W. ° 5 10' 6		H. M.	Ft.
Marbella.	1 F.	12	55	A cable's length, W. of the town	36 31	4 54' 3			
CALABURRA.	1 F. & Fl. ev. 3 min.	16	115	On the point	36 30' 7	4 38			
MALAGA.	1 F. & Red FL. ev. 2 min.	15	125	109 yards from E. Mole Head	36 43' 5	4 25' 6			
Velez Malaga.	1 F.	11	41	E. side of entr.	36 44	4 9' 3			
TORROX.	1 F.	15	93	Ruins of old castle	36 45' 2	3 59' 4			
SACRATIF.	1 F. & Fl. ev. min.	24	320	On the Cape	36 41	3 28' 9			
Honda Cove.	1 F. Red.	8	44	Punta del Llano de Carchuna, W. point of entr.	36 41	3 25' 9			
Adra.	1	-	-	On the point	36 44	3 2	<i>Building.</i>		
ENTINAS.	1 F.	-	-	On the point	36 41' 2	2 48' 8	<i>Building.</i>		
SABINAL.	1 F. & Fl. ev. 2 min.	18	105	On the point	36 41' 3	2 44			
Roquetas.	1 F.	9	57	On Beach, S. of the town	36 45' 2	2 41' 8			
Almeria.	1 F.	9	26	Mole Head	36 50' 7	2 33' 3			
CABO DE GATA.	1 Rev. ev. ¼ min.	19	194	On the Cape	36 43' 6	2 14' 2			
MESA DE ROLDAN	1 F. & Fl. ev. 2 min.	22	725	On the Mount	36 54' 7	1 58' 3			
Villaricos.	1 F.	9	63	1½ miles N. of Almanzora River	37 11' 3	1 52' 8			
Aguilas Port.	1 F.	5	48	W. part of Mount Aguilas, Punta Negra	37 23' 5	1 39' 4			
Mazarron.	1 F.	7	200	On the Pier	37 33' 2	1 17' 3			
TINOSO.	1 F.	20	479	On the Cape	37 31' 3	1 9' 1			
Cartagena.	1 F. Red.	4	223	Escobrera Id., highest part	37 33' 5	0 57' 9			
„	1 F.	10	123	Battery on pt. Podadera	37 35' 5	0 58' 6			

1.  
Name  
Ligh  
Puerto d  
Pormar

PALOS.

Hormiga  
Estacio.

Torre Vieja

PLANA, o  
TABARCA  
Santa Pol

Alicante.

Huertas.  
Villa-joyo  
Altea.

SAN ANTON

CULLERA.  
Grao de V  
El Caban

OROPESA.

COLUMBR  
ROCKS.

Vinaroz.

PTITICSA  
BALEAR

FORMENT

PUERCOS,  
Iviza Is

CABRERA  
Iviza Is

Botafoc,  
Iviza Is

CONEIRA  
Iviza Is

DRAGONE  
Islet, I

Island.



LIGHTS AND TIDES.—MEDITERRANEAN.

55

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Puerto de Porman.	1 F.	Miles 9	Fect. 162	Chapa pt. Hill, E. side of entr.	N. 37 34.2	W. 0 49.5	Entering or leaving Porman a berth of 1½ cable should be given to the point projecting from the foot of the hill in a westerly direction, so as to avoid the shoal of 13 feet water, running off from Barco point	H. M.	Ft.
PALOS.	1 Rev. ev. min.	23	263	On summit, E. extr. of Cape, W. by S. ½ S., 2½ miles from Hormiga light	37 37.5	0 40	This and Hormiga lt. point out the channel between the Hormigas and the Cape.		
Hormiga Grande Estacio.	1 F.	10	75	On the Islet	37 38.5	0 38.1			
	1 F. Red.	6	62	On the Beach, La Mauga	37 45	0 42.6			
Torrevieja.	1 F. Red.	4	33	Punta Cornuda Fort	37 58.1	0 39.9	Shifted seaward as the mole advances.		
PLANA, or TABARCA ISLE.	1 F. & Fl. ev. 2 min.	15	90	621 yards from E. point of Id.	38 10.2	0 26.6			
Santa Pola.	1 F.	7	499	On Talayola Tower, 395 yds. from the sea	38 12.5	0 30.1			
Alicante.	1 F. Red.	2	26	Rocks off the Mole Head	38 19.2	0 27.5	Temporary.		
Huertas.	1 F.	10	123	On the Cape	38 20.5	0 22.6			
Villa-joyosa.	1 F.	5	52	On the Mole	38 30	0 11.6			
Altea.	1 F.	9	367	Albir point	38 33.5	0 4			
SAN ANTONIO.	1 Rev. ev. ¼ min	25	571	On the Cape	38 48.5	0 12.7			
							East. 0 12.7		
							West. 0 13.5		
CELLERA.	1 F.	15	92	On the Cape	39 12.2	0 13.5			
Grao de Valencia	1 F.	7	37	On the Mole	39 28.3	0 20			
El Cabanal.	1 F.	9	66	Hermitage, South Tower	39 28.8	0 20.1			
							East. 0 20.1		
OROPESA.	1 F. & Fl. ev. 3 min.	15	74	On the Cape	40 6.6	0 9.1			
COLUMBRETES ROCKS.	1 F.	21	190	N.E. part of Monte Colibre 140 yds. from the sea	39 54	0 44.4			
Vinaroz.	1 F. Red.	6	26		40 29.3	0 28.4			
PITHUSAS & BALEARES IDS.									
FORMENTERA.	1 F.	18	518	Codolar point, S.E. pt. of Id.	38 38.2	1 36			
PUERCOS, Iviza Island.	1 F. & Red Fl. ev. 3 min.	15	94	N.W. part of Islet, 40 yards from the sea	38 48	1 29.4	This and Ahercados light mark the principal channel between Iviza and Formentera Islands.		
CARRERA ISLES, Iviza Island.	1 F.	16	92	Ahorecados Isle	38 48.7	1 28.8			
Botafoch, Iviza Island.	1 F.	9	102	Islet, N. side of entrance	38 54	1 31			
CONEJERA ISLE, Iviza Island.	1 Rev. ev. min.	20	289	Cape Blanco	38 59.8	1 16.5	Eclipses not total at 3 or 4 miles distant.		
DRAGONERA ISLET, Majorca Island.	1 F. & Fl. ev. 2 min.	18	1180	On the Peak	39 35	2 20.7			

9.  
Rise of Springs.  
M. Ft.

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
BALEARES IDS. continued—		Miles	Feet.		N.	E.		H. M.	Ft.
PORT SOLLER, Majorca Island	1 F.	15	467	Grosa point, W. side of entr.	39 49.1	2 43.6			
„	1 F.	9	77	Cruz point, E. pt. of entrance	39 48	2 44.1			
FORMENTO, Majorca Island	1 Rev. ev. 30 s.	19	592	On the Cape, N. pt. of Id.	39 57.7	3 14.9			
Aucanada, Majorca Island	1 F.	9	77	E. and highest pt. of Islet	39 49.8	3 12.4			
PERA, Majorca Island.	1 F. & Red Fl. ev. 2 min.	18	241	Summit of Cape	39 43	3 30.1			
Puerto Colom, Majorca Island	1 E.	10	46	N.E. pt. of entr.	39 25	3 18.4			
Salinas, Majorca Island.	1 F.	10	50	On the point	39 16.5	3 5.9			
Cape Blanco, Majorca Island	1 F.	10	294	On the Cape	39 22	2 49.9			
Port Pi, Majorca Island.	1 Rev. ev 2 min.	8	132	At the S. entr.	39 33	2 40.4			
Palma Port, Majorca Island	1 F. Pale Blue.	4	37	On the Mole	39 34	2 40.9			
Cala Figuera, Majorca Island	1 F.	12	116	On the Cape, 108 yds. from extremity	39 27.7	2 33.9	Visible 295° seaward.		
DARTUCH, Minorca Island	1 F. & Fl. ev. 3 min.	16	70	On the Cape	39 54.6	3 52.2			
Ciudadela, Minorca Island	1 F.	7	66	Punta Enderrocat, W. side of entrance	39 59.7	3 51.7			
CABALLERIA, Minorca Island	1 F.	18	308	On the Cape	40 5.7	4 9.4			
PORTMAHON, Minorca Island	1 F.	7	74	Fort San Felipe, 137 yds. from Castle pt.	39 52	4 24.4	Opens Cape Mole on a W. by S. $\frac{1}{2}$ S. bearing.		
AYRE ISLAND, Minorca Island	1 Rev. ev. min.	20	171	On the Islet, S.E. part	39 47.6	4 24.2			
Alfaques de Tortosa.	1 F.	13	62	Bana point	40 34.5	0 39.1	Vessels entering or leaving Port Alfaques at night should give Bana light a berth of at least $\frac{1}{2}$ a mile. The bell buoy off Galacho point should be left to the eastward.		
San Carlos de la Rapita, Port Alfaques	1 F. Red.	6	30	Senieta point	40 36.7	0 34.7			
RIVER EBRO									
TORTOSA CAVE.	1 Rev. ev. min.	20	174	E. extremity, Buda Island	40 43.4	0 57	Vessels passing in a heavy sea should give the lighthouse a berth of at least a mile.		
Fangal Port.	1 F.	8	25	Fango, or E. pt. of entrance	40 47	0 47.2	Vessels in rounding the point should give it a berth of a mile.		
SALOU.	1 F. & Fl. ev. 4 min.	15	140	Near the Cape	41 3.9	1 9.6			
„	1 F.	5	27	On the Mole	41 3.8	1 8.9	Temporary; when the Mole is finished it will be replaced by a Rev. lt. Not lighted three days before or after the full moon.		

1.  
Name of LightTarragona  
LOBREGU  
RIVER.

Barcelona

CALELLA.

„

SAN SEBA

Rosas Bay

Cadaques.

Creux.

CAPE BEA  
PORT VEN

„

„

Port Nou  
AGDE.

„

„

Cette.

LIGHTS AND TIDES.—MEDITERRANEAN.

B. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Feet.		° N.	° E.		H. M.	Ft.
		Tarragona.	1 F.	10	54	On the Mole	41 6	1 14.7			
		LLOBREGAT RIVER.	1 Rev. ev. $\frac{1}{4}$ min	18	107	N. side of entr., on an old Fort- ress	41 19.2	2 8.9			
		Barcelona.	1 F. & Red Fl. ev. 4 min.	9	43	Extremity of E. Mole Head	41 22.2	2 10.9	At the extr. of a ledge of stones, 340 yds. distant is a <i>Green</i> light to clear the Pier-head extension.		
		CALELLA.	1 F.	-	-	Extremity of Jetty, in con- struction	-	-			
		"	1 F. & Fl. ev. 2 min.	18	166	On the Height of the Torreta	41 36.7	2 39.6			
		SAN SEBASTIAN.	1 Rev. ev. min.	22	548	On the Cape, near the Her- mitage	41 53.5	3 12.4			
		Rosas Bay.	1 F. & Fl. ev. 2 min.	12	78	Poncella point	42 14	3 10.7			
		Cadaques.	1 F.	10	116	Calanans point, S. side of entr.	42 15.5	3 17.2			
		Creux.	1 F. & Fl. ev. 3 min.	15	285	Near the Cape, 550 yards in shore	42 18.7	3 19.3			

COAST OF FRANCE.

CAPE BEARN.	1 F.	22	751	Mount Béarn	42 31	3 7.4	
PORT VENDRES.	1 F.	10	98	Fort Fanal, W. side of entr.	42 31.3	3 6.7	
"	1 F.	7	36	Fort Béarn, S.E. entrance	42 31.1	3 6.7	} Lights in one lead into the Port, 69 yards from the Pier-head.
"	1 F. Red.	8	67	217 yards S. W. $\frac{1}{4}$ S.	-	-	
Port Nouvelle.	1 F.	10	33	W. Jetty Head	43 0.8	3 3.9	
AGDE.	1 F.	6	30	E. Jetty Head, entr. Herault River	43 16.7	3 26.6	
"	1 F.	10	59	S.E. Bastion, Fort Brescou, 3 miles S.E. from mouth of River	43 15.5	3 29.9	
"	1 Rev. ev. min.	27	413	On Mount Agde, $2\frac{3}{4}$ miles E. $\frac{1}{4}$ N. from River's mouth	43 17.9	3 30.1	In ordinary weather the eclipses are not total within 12 miles.
Cette.	1 F.	12	105	On Mole, St. Louis Head, W. side of entr.	43 23.8	3 42	

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & U.	9. Rise of Springs.
					Lat.	Long.			
Cette.	2 F. Vertical.	Miles 4	Feet. 272	S.W. angle, Fort Richelieu	° N. / ° E. /	° / ° /	840 yards W. by N. $\frac{1}{2}$ N. from Mole Head light. These lights appear as one beyond the distance of $1\frac{1}{2}$ miles; when in line with St. Louis Mole lt. they indicate the direction of the Eastern entrance. They will be replaced later by lts., one on Frontignan Jetty, the other on N.E. Pier-head of breakwater.	H. M.	Ft.
AIGUES MORTES.	1 F. & Fl. ev. 4 min.	15	66	N. Mole of Chan. 186 yards from Head	43 32	4 7.9	Will be removed on Espiquette point.		
„	1 F. Red.	3	23	N.W. Mole-head	- - -	- - -			
CAMARQUE, or FARAMAN.	1 F.	20	125	Mouth of the Vieux Rhone, East side	43 20.7	4 40.8			
Boue.	1 F.	10	52	Mole-head, N side of entr.	- - -	- - -			
„	1 F.	10	98	Tower in Fort, S. side of entr.	43 23.6	4 59.1			
Ile Château d'If.	1 F.	9	69	E. pt. of Island	43 16.8	5 19.8			
Marseille.	1 F. Red.	8	82	Joliette Port, S. pt. of Mole	43 17.9	5 21.4			
„	1 F.	9	30	Foot of Fort St. Jean Tower, N. side of entr.	43 17.7	5 21.6			
„	1 F. & Fl. ev. 3 min.	10	62	Tête-de-More, S. side of entr.	43 17.7	5 21.4	} Concealed by the Land to the S. E.		
Planier Rock.	1 Rev. ev. $\frac{1}{2}$ min.	20	131	On the Rock	43 11.9	5 13.7	Eclipses not total within 6 miles.		
Cassis.	1 F.	10	92	W. side of entr.	43 12.8	5 31.9			
Ciotat.	1 F.	10	39	Berouard Mole Head, N. side of entrance	43 10.3	5 36.6	To be kept to starboard on entering.		
„	1 F. Red.	-	52	New Mole Head	43 10.3	5 36.6	To be kept to port on entering.		
Grand Rouveau Les Ambiez.	1 F.	14	151	On the Islet	43 4.7	5 46.2			
SEPET CAPE.	1 F. & Fl. ev. 3 min.	12	194	On Rascas pt.	43 4.1	5 56.6	White and Red alternately.		
Toulon Road.	1 F.	9	52	Grosse Tour	43 6.2	5 55.5			
„	2 F. Green.	2 or 3	-	Floating on S.W. extreme, l'Ânc Bank	- - -	- - -			
Grand Riband Id. in Western Pass, to Hyeres Road.	1 F.	10	112	On the summit	43 1	6 8.5			
PORQUEROLLES.	1 F. & Fl. ev. 4 min.	20	262	S. pt. of Island	42 59	6 12.3	Eclipses not total within 12 miles.		
Blanche Point.	1 F. Red.	5	171	Battery on the Cape	43 5.3	6 21.7			
LEVANT OF TITAN CAMARAT.	1 F.	15	246	E. pt. of Island	43 2.8	6 30.5			
„	1 Rev. ev. min.	27	426	On the Cape	43 12	6 40.4	Eclipses not total within 12 miles. The interval of revolution distinguishes this light from that of the Planier Rock.		

1.  
Name  
Light

St. Trope.

Cannes.  
ANTIBES.„  
NICE.

VILLA FR

CAPE COR  
Bastia.

„

„  
ALISTRO.

PORTO V

Récif La  
Bell BoBONIFACE  
and STR

„

AJACCIO

„

„

CALVI.

Port Ros  
lle Rou

„

LIGHTS AND TIDES.—MEDITERRANEAN.

59

1.	2.	3.	4.	5.	6.		7.	8.	9.
					Position.				
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
		Miles	Feet.		N.	E.		H. M.	Ft.
St. Tropez.	1 F. <i>Red.</i>	5	36	On Jetty, N. side of Port	43 16.4	6 38.1			
Caunes.	1 F.	10	49	On the Mole	43 32.8	7 0.8			
ANTIBES.	1 F.	20	338	1½ miles S. by W. ¼ W. of Antibes, on Garoupe Peninsula	43 33.8	7 7.6	In coming from the eastward vessels will see at the same time, Villa Franca, Nice, Port Antibes, and Garoupe Peninsula lights; the last is only visible to vessels from the S.W. till round Cape Gros.		
..	1 F. & Fl. ev. 2 min.	10	49	S.E. Mole Head	43 35.1	7 7.7	Preceded and followed by short eclipses ev. 4 and 5 s.		
NICE.	1. F. & <i>Red</i> Fl. ev. ¼ min.	10	82	Extremity of outer Mole	43 41.5	7 17.7	Is extinguished when the harbour is not approachable.		
VILLA FRANCA.	1. F. & Fl. ev. ½ min.	18	224	Mala or Villa Franca point	43 40.5	7 19.6			

CORSICA.

CAPE CORSO.	1 Rev. ev. ¼ min.	22	269	Giraglia Isle	43 1.7	9 24.1	Eclipse not total within 10 miles.		
Bastia.	1 F.	11	82	Dragon Bastion	42 41.9	9 26.9			
..	1 F. <i>Green.</i>	5	36	L'Eperon, New head of Old Mole	-	-	To be left to Starboard.		
..	1 F. <i>Red.</i>	5	36	Dragon Jetty	-	-	To be left to Port.		
ALISTRO.	1 F.	25	308	N. of pt. Aleria	42 15.7	9 30.9			
PORTO VECCHIO.	1 F. & Fl. ev. 4 min.	20	217	On Chiape pt.	41 35.7	9 22			
Réif Lavezzi, Bell Boat.	-	-	-		41 19	9 16	Proposed, with glasses to reflect the neighbouring lights.		
BONIFACCIO PORT and STRAIT.	1 Rev. ev. min.	27	325	Cape Pertusato	41 22.2	9 11.1	Not total within 12 miles.		
..	1 F.	10	98	Madonetta pt.	41 23.3	9 8.6			
AJACCIO GULF.	1 F. & Fl. ev. 4 min.	20	322	Sanguinaire Id.	41 52.8	8 35.6			
..	1 F.	10	62	On the salient angle of Citadel	41 55	8 44.4			
..	1 F. <i>Red.</i>	3	20	Mole Head, at Margonajo	-	-			
CÁLVI.	1 F.	20	289	Extremity of Revellata pt.	42 35.2	8 43.3			
Port Rossa, or He Rousse.	1 F. <i>Red.</i>	6	180	Highest part of Pietra, or Rossa Island, N.W. point	42 38.8	8 55.7			
..	1 F.	5	38	Isola Rossa, Jetty Head	-	-			

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## SARDINIA ISLAND.

		Miles	Feet.			N.	E.		H.	M.	Ft.
RAZZOLI ISLAND.	1 F.	16	282	N. pt. in Bonifacio Strait	41 18.5	9 20.5					
Caprera Isle.	1	-	-	Galera point	41 14.2	9 29.7	<i>Proposed.</i>				
TESTA.	1 F. & Fl. ev. 3 min.	15	220	On the Cape	41 14.7	9 8.9					
FERRO.	1 Rev. ev. ½ min.	17	220	On the Cape	41 8.7	9 32.6					
Tavolaro.	1	-	-	On the Cape	40 54	9 44.1	<i>Building.</i>				
Bellavista.	1	-	-	On the Cape	39 55	9 43.1	<i>Building.</i>				
CAYOLI ISLAND.	1 Rev. ev. ½ min.	25	241	Cape Carbonara	39 5.3	9 32.6					
ST. ELIAS.	1 F. ( <i>Red</i> Fl. ev. 2 min.)	14 ( <i>Red</i> 11)	239	On the Cape	39 11	9 9.9	The light will open on a N.E. ¼ N. bearing when entering the Gulf of Cagliari from the westward, and on a N.W. ¼ W. bearing when from the eastward.				
Cagliari.	2 F. <i>Red.</i>	4	26 each	Entrance of Harbour	39 12.6	9 7.3					
CAPE SPARTIVENTO.	-	-	-	On the Cape	38 52	8 53.3	<i>Proposed.</i>				
ST. PIETRO ID.	1 F. & Fl. ev. min.	28	436	Cape Sandalo	39 8.7	8 14.3					
CACCIA.	1 F. & Fl. ev. 4 min.	26	610	W. entrance to Porto Conte	40 33.6	8 10.1					
ASINARA ISLAND and GULF.	1 F.	24	262	Caprara or Scorno Cape.	41 7.7	8 12.3					
..	1 F.	10	49	N. pt. of Island Port Torres, eastern Mole extremity	40 50.7	8 24.4					

## COAST OF ITALY AND ADJACENT ISLANDS.

Maurizio Port.	1 F.	3	23	Extremity of the Mole	43 52.6	8 1.7	<i>White</i> face towards the East and <i>Red</i> towards the West.
Oneglia.	1 F.	3	26	Mole, E. of the Port	43 53.1	8 2.6	Two faces, <i>Red</i> and <i>White</i> .
DELLE MELE.	1 F.	20	330	On the Cape	43 57.3	8 10.3	
Vado Port.	1 F.	3	43	San Lorenzo Port	44 16.1	8 26.5	
Savona Port.	1 F.	3	32	Extremity of E. Mole	44 18.7	8 29.5	
GENOA.	1 Rev. ev. ½ min.	24	370	Battery, west side of harbour	44 24.1	8 54.3	Eclipses not total within 15 miles.
..	1 F.	6	42	W. Mole Head	44 24.6	8 54.6	Pale <i>Red</i> light. In entering keep to eastward of the large buoy placed off the Mole.
..	1 F. & Fl. ev. ½ min.	10	94	E. Mole Head	44 24.8	8 55	Eclipses not total within 6 miles.

LIGHTS AND TIDES.—MEDITERRANEAN.

1.	2.	3.	4.	5.	6.		7.	8.	9.
					Position.				
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
		Miles	Fect.		° N.	° E.		H. M.	Fl.
Fino Port.	1 F.	3	23	N. side of entr.	44 18.2	9 13.3			
Venere Port.	1 F.	3	20	"	44 3.1	9 50.2			
SPEZIA BAY.	1 F.	15	384	S.W. part Tino Island	44 1.6	9 53			
Viareggio.	1 F.	10	46	On Pier	43 51.7	10 14.6			
LIVORNO, or LEGHORN.	1 Rev. cv. 40 s. Red & White	19	167	S. pt. of an Island 3 cables from the Mole pt.	43 32.6	10 17.7	Eclipses not total within 9 miles. A light shows in the Marzocco Tower in stormy weather. A Blue flag near Mole Head when vessels are not to enter the old port.		
"	1 F. Red.	-	51	S. Head of the Curved Break-water	-	-			
"	1 F.	10	74	N. end of Break-water	-	-	Principal light bears S. $\frac{1}{4}$ E., and the Marzocco Tower N.E. $\frac{1}{4}$ N.		
"	1 F.	-	-	S.W. extreme Strait Jetty, on N. side	-	-			
Capraia Isle.	1 F.	4	116	Ferrijione Cape	43 2.9	9 51			
ELBA ISLAND.	1 F.	12	200	Stella Fort	42 48.9	10 20.3			
"	1 F.	3	21	Gallo Fort, near Sasita Maritima	-	-			
"	1 F.	13	105	Focardo Fort	42 45.2	10 24.7			
"	1 F.	8	46	San Giovanni point	-	-			
"	1 F.	-	-	Breakwater	-	-	Proposed.		
PALMAJOLA	1 Int. cv. $\frac{1}{2}$ min.	20	344	Centre of Island	42 51.9	10 28.4			
Pianosa Island.	1 F.	10	78	On the Battery, W. of Port	42 33	10 6.1			
Port Talamone.	1 F.	10	98	S. of the Port, extremity of the Castle Wall	42 32.5	11 8			
Port San Stefano	1 F.	10	108	Near Lividonia pt. right side of entrance	42 26.4	11 6.4			
Giglio Island.	1 F.	5 or 6	18	Giglio Port, Mole Head	-	-			
"	1 Rev. cv. min.	26	1017	Vaccherechie Hill	42 21.5	10 53.8	Masked between N.N.W. $\frac{1}{4}$ W. round N. to N.N.E. $\frac{1}{4}$ E.		
Port Ereole.	1 F.	6	-	Rocca Fort	42 23.4	11 12.7			
"	1 F.	8	52	Santa Barbera Battery, left side of entr.	-	-			
CIVITA VECCHIA.	1 Rev. cv. 40 s.	16	120	Antemuzale, S. end of Break-water	42 5.4	11 44.1	Visible seaward between N. by W. $\frac{1}{4}$ W. and S. by E. $\frac{1}{4}$ E. Not total within 10 miles.		
"	1 F. Green.	3	23	Bicchiere Mole	-	-			
"	1 F. Green.	3	23	Lazaretto Mole	-	-			
Fiumicino.	1 Rev.	6	95	Mouth of the Tiber	41 46.2	12 11.6			
Anzio, or Anzo.	1 F.	4	56	On Mole Head	41 26.9	12 42.2			
MONTE CIRCELLO	1 F.	-	-	"	41 12.7	13 5.2	Proposed.		

W. at & C.  
9. Rise of Springs.

M. Fl.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Badino, Terracina.	2 F.	Miles 6	16	Extr. of Canal Mole Head	° N. / ' / "	° E. / ' / "		H. M.	Pt.
	1 F.		2 or 3		-	41 16.8			
GAETA.	1 F. and Fl. ev. 3 min.	18	235	St. Catherine Tower	41 12.4	13 35.3			
"	1 F.	8	37	St. Maria Tower entrance of the Port	41 12.6	13 35.3			
Ponza Island.	1 Rev. ev. ½ min. <i>Red &amp; White</i>	-	-	N.E. part of Id	-	-	<i>Building.</i>		
"	1 F.	Sor10	200	Rotunda della Madonna sum- mit, S. side of the Port	40 53.6	12 58			
"	1 F.	6	38	Extr. of Jetty, in the Battery	40 53.6	12 50.4			
"	1 F.	-	-	Vandotena Isle	40 47.5	13 25.5	<i>Proposed.</i>		
San Angelo.	1	-	-	On the point	40 41.4	13 53.3	<i>Proposed.</i>		
ISCHIA ISLAND.	1 F.	24	197	Point Caruso	40 45.4	13 51.8	<i>Proposed.</i>		
"	1 Rev. ev. 3 min. <i>Red &amp; White</i> flashes	12	43	Entr. of Port, N.E. side of Island	40 44.8	13 56.5			
"	2 F.	6	-	Bagno Port	40 44.7	13 56.5	<i>Green on the W. side and Red on the E. side.</i>		
PROCIDA ISLAND.	1 F.	12	75	Chiupetto point	40 46.2	14 1			
CAPE MISENO.	1 Rev. ev. ½ min.	26	197	On S. point	40 46.6	14 5.2	<i>Proposed.</i>		
Baia.	1 F.	6	46	Tenaglia Fort	40 48.7	14 3.7	<i>In bad weather seen only 4 miles.</i>		
Puteolano, or Puozzuoli.	1 F. <i>Red.</i>	3	26	New Mole, or outer Pier of Calignla Bridge	40 49.3	14 7	<i>Provisional.</i>		
NISITA ISLAND.	1 Rev. ev. 2 min.	12	78	N. point, extr. of the Mole	40 47.8	14 9.8			
NAPLES.	1 F. <i>Red.</i>	6	32	Extremity of the Mole	40 50.3	14 15.6			
"	1 F. <i>Green.</i>	2	-	Lt V. ½ cable E.S.E. from light on Mole	-	-	<i>Temporary, should have a wide berth in passing.</i>		
"	1 Rev. ev. 2 min.	20	158	Elbow of the Mole	40 50.2	14 15.6			
"	1 F. & Fl. ev. 3 min.	10	35	Porto Militaire, E. extr. of New Mole	40 50	14 15.6	<i>S. ¾ E. 500 yards from high lt. Bring the light to bear W.S.W. and run in on that bearing.</i>		
CASTELLAMARE.	1 Rev. ev. min.	15	106	Battery at the Mole Head	40 41.6	14 28.1			
Campanella.	1 F.	10	77	On the point	40 34.1	14 19.2	<i>This light leads through the Bocca Piccola.</i>		
CAPRI ISLAND.	1 Rev. ev. ½ min.	25	262	Carena point	40 32.1	14 12	<i>Proposed.</i>		
ORSO.	1 F. & Fl. ev. 3 min.	13	82	On the Cape	40 37.5	14 41	<i>F. light vis. 132 s.; Flsh. 6 s.; preceded and followed by eclipses of 21 s.</i>		
Fuente.	1 F.	9	83	On the Cape	40 39	14 44			

NAPLES  
Lig.

FARO.

MESSINA

"

"

Catania.

SANTA C

AGUSTA

MAGNISI

SYRACUSE

"

MURRO I

PASSEIRO

TORRE

SLOPE.

CORREN

Isle of

SEARAM

PUNTA

Girgent

MONTE

CAPE G

Marsala

FAVIGN

MARET

LEVANZ

Formich

Isle.

Palumb

TRAPAN



8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			

SICILY AND ADJACENT ISLANDS.

H. M.	Ft.									H. M.	Ft.
			Miles	Fect.		N.	E.				
		FARO.	1 F. & Fl. ev. 3 min.	11 to 14	72	Pelorus Tower	38 16·9	15 41·5			
		MESSINA.	1 F. <i>Red.</i>	2	85	Salvatore Fort, extr. of Campana Fort	38 11·8	15 34			
		„	1 F.	3	23	N. by W. from San Ranieri	38 11·5	15 34·5	A small light; will be replaced by a Flashing light ev. 3 min.		
		„	1 F. (a bright <i>Red</i> flash ev. 2 min.)	12	123	E. part of the Citadel point, San Ranieri Tower	33 11·5	15 34·3			
		Catania.	1 F. <i>Red.</i>	2	22	Extr. of Mole	37 29	15 5·2			
		SANTA CROCE.	1 F.	14	91	On the Cape	37 15·3	15 15·5			
		AUGUSTA.	1 Rev. ev. 3 min	14	90	Avola Island	37 12·8	15 13·4			
		MAGNISI.	1 F. <i>Green.</i>	10	49	Greco point	37 9·7	15 14·7			
		Syracuse.	1 F. <i>Red.</i>	10	86	Maniace Castle, N. side of entr.	37 3	15 16·2			
		„	1 F.	3	125	Massa point, S. side of entr.	37 2·3	15 16·3			
		MURRO DI PORCO	1 Rev. ev. ¼ min.	20	108	On the Cape	37 0·2	15 18·8			
		PASSERO CAPE, TORRE NOBILE SLOPE.	1 Rev. ev. 2 min.	18	269	On Cozzo Spadaro Hill	36 41·2	15 8·8			
		CORRENTI, or Isle of Currents	1 F.	11	56	On the Island, S. E. end of Sicily, near Cape Passero	36 38	15 3·5			
		SCARAMIA, or PUNTA SECCA.	1 F.	18	123	On the Cape	36 46·2	14 30·3			
		Girgenti.	1 F. <i>Red.</i>	10	52	Extr. of Pier	37 15·6	13 31·8			
		MONTE ROSSELLO	1 F. & <i>Red</i> Flsh. ev. 2 min.	20	322	On the point	37 16·8	13 27·1			
		CAPE GRANITOLA	1 F.	19	123	On the Cape, 9-10 mile S. of extreme	37 33·7	12 36·8			
		Marsala.	1 F. and Fl. ev. 1½ min.	12	55	Mole Head, entr. of new port	37 48·1	12 28·1			
		FAVIGNANA ID.	1 F. <i>Green.</i>	10	61	Marsala point, S. E. part	37 53·9	12 22·5			
		„	1 Rev. ev. min.	20	141	Ferro, W. pt. of Island	37 56	12 17·2			
		MARETIMO ID.	-	-	-	Libeccis point	37 57·7	12 3·7	<i>Proposed.</i>		
		LEVANZO.	1 F.	18	282	Cape Grosso	38 1·2	12 22			
		Forniche, E. Isle.	1 F. <i>Red.</i>	10	85	N. E. part of Tower	37 59·4	12 26·2			
		Palumbo Rock.	1 F. <i>Green.</i>	2	-	Breakwater extreme	38 0·8	12 30			
		TRAPANI.	1 F. & Fl. ev. 3 min.	11 to 14	139	Columbara Id., S. pt. on Mole Head	38 0·7	12 30·5			
		„	1 F. <i>Red.</i>	-	-	-	38 2	12 31	A guide to the anchorage.		

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
ST. VITO.	1 F. & Red Flsh. ev. 2 min.	20 Miles	142 Feet.	173 yards from extr. of Cape	38 13·5	12 45·1		H. M.	Ft.
GALLO.	1 F.	11 to 14	145	On the Cape	38 14	13 24·1			
PALERMO.	1 F. & Fl. ev. 2 min.	11 to 14	92	On Mole Head	38 8·2	13 22·8			
MILAZZO.	1 F.	Sto 12	285	N. extremity of Peninsula	38 16	15 13·9			
VULCANO ISLAND.	1 F. & Fl. ev. 3 min.	11 & 14	452	Rosario, or S.W. point	38 22	14 59			
Lipari.	1 F.	-	-	On the highest house of Casa Bianca	38 28·7	14 57·5	<i>Temporary.</i>		

## ISLANDS OF MALTA.

GOZO ISLAND.	1 Rev. ev. min.	24	400	N.W. point, highest part	36 4	14 10			
MALTA ISLAND.	2 F. Vertical.	4	71 46	Tigne pt., Marsa Musciet Harb.	-	-			
Malta, Valetta Harbour.	1 F.	15	167	Castle of St. Elmo	35 54	14 31·5			
„	2 F. Red. Vertical.	4	80 55	N.W. angle, Ricasoli Fort	-	-			
„	1 F. Red.	8	148	Marsa Scirocco, Dallamara pt.	35 49·5	14 34			
Lampedusa Id.	1 F.	-	-	Cavallo Bianca point	35 29·1	12 36·1			

## COAST OF ITALY.

St. Venero.	-	-	-	Between Pizzo and Bivona	38 45	16 11·5	<i>Proposed.</i>		
Reggio.	1 F.	5	75	Church of Santa Maria Porto Salvo	38 6·7	15 38·7			
CAPE SPARTIVENTO.	-	-	-	-	37 56	16 3·5	<i>Building.</i>		
Taranto.	1 F.	7	64	Cape St. Vito	40 24·7	17 12·2			
Santa Paolo Id.	-	-	-	-	40 24·7	17 10·5	<i>Building.</i>		
Gallipoli.	-	-	-	On detached Mole	40 1·7	17 58·7	<i>Proposed.</i>		
St. Andrea Islet.	1 Rev. ev min.	20	147	On the Islet, 1½ miles from Port Gallipoli	40 2·5	17 56·1			
S. Maria.	-	-	-	On the Cape	39 47·5	18 23	<i>Proposed.</i>		
BRINDISI.	1 F. and Fl. ev. 3 min.	13	72	Petagne Rocks	40 39·5	17 59·5	Arc of visibility seaward 300°		
„	1 F.	8 to 12	106	Castello Island	40 39·4	17 58·7	Between the two towers is the entrance to Brindisi Port.		

LIGHTS AND TIDES.—MEDITERRANEAN.

65

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3.		4. Height of light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
				Visibility.	Miles			Feet.	Lat.			
								N.	E.		H. M.	Ft.
		C. GALLO.	1 Rev. ev. ¼ min.	20	129		Torre di Penne	40 41.1	17 56.3	Visible round the horizon.		
		Monopoli.	1 Int.	9	-		Extr. of Jetty	40 57.2	17 22			
		Mola.	1 Int.	9	-		On the Pier	41 3.9	17 8			
		Bari, N. side.	1 F. <i>Red.</i>	5	21		W. Mole Head extreme	41 6.5	16 52.7	The entrance to the Port is N. W. of the light.		
		St. Cataldo.	1	-	-		On the point	41 9	16 53	<i>Proposed.</i>		
		MOLFETTA.	1 F. and Fl. ev. 3 min.	14	64		Extremity of detached Mole	41 12.4	16 31.5			
		Barletta.	1 F.	14	69		Extreme east- ern Mole	41 13.2	16 36.3			
		Manfredonia.	1 F.	6	26		On end of Mole	41 37.8	15 55.9			
		„	1 F. <i>Red.</i>	-	-		S. of a village, shown from a wall	-	-			
		Pelegosa Island.	1	-	-		-	42 24	16 17.2	<i>Proposed.</i>		
		Viesti.	1	-	-		-	41 52.7	16 11	<i>Building.</i>		
		ASCONA.	1 F. <i>Red.</i>	6	59		Mole Head of St. Clement	43 37.7	13 30.4	Lt. S. W. ¾ S. clears the Volpe Rocks. In going in keep 1½ cables from light.		
		„	1 Rev. ev. 45 s.	21	406		Monte dei Cap- puccini, ¼ mile E. of Port	43 37.6	13 31.1			
		Sinigaglia.	1 F.	6	59		On E. Mole	43 43	13 13.1	Anchor with the lt. bearing S. W.		
		Fano.	1 F.	6	50		On E. Mole	43 51.3	13 1.1	Lighted occasionally.		
		Pesaro.	1 F.	6 to 9	50		Centre of E. Mole	43 55.7	12 54.5			
		Rimini.	1 F.	4	25		End of E. Mole	44 4.6	12 34.5			
		CESENATICO.	1 Rev. ev. min.	12	30		On E. Mole or	44 12	12 26			
		„	1 F.	-	55		Stockade, N. E. and S. W.	-	-			
		Cervia.	1 F.	6	42		On the Mole	44 15.9	12 21.1			
		Ravenna.	1 F.	6	42		On the Mole, near Corsini Canal	44 28.9	12 17	To be left on the port side on entering.		
		Po di Goro.	1 F.	14	66½		Near Punta di Goro, right hand side of river's mouth	44 48.7	12 20.6	This light will be useful to point out Gore Road, which is a safe anchorage in a bore or N. E. wind		

NORTH AND EAST COASTS OF THE ADRIATIC; IONIAN ISLANDS, &c.

Malamocco.	2 F. <i>Red.</i> <i>White</i>	12 6	45 each	Rochetta inner Mole, Spignon Canal	45 20.2	12 20	<i>Temporary.</i> N. W. by W. and S. E. by E., 1380 yards.
Chioggia Port.	1 F. <i>Sky Blue.</i>	12	52	Fort St. Felice Tower, S. pt. of entrance	45 13.3	12 16.4	
Lido Port.	1 F.	9	-	-	45 26	12 30.2	
PIAVE VECCHIA.	1 F.	14	148	On the E. point	45 28.8	12 35.1	An Argand Lamp.
Grado Port.	1	-	-	-	45 40.5	13 22.2	<i>Proposed.</i>
TRIESTE.	1 Int. ev. ¼ min. (Flash S s.)	13	116	Santa Teresa Mole	45 38.8	13 45	
BASSANIA.	1 F.	24	110	Salvatore point	45 29	13 29.5	
ROVIGNO.	1 F. & Fl. ev. 2 min.	12	73	Giovanni Rock	45 2.5	13 35.7	Alternately <i>Red &amp; White.</i>

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Spring.
					Lat.	Long.			
		Miles	Feet.		N.	E.		H. M.	Ft.
Pola.	1 Rev. cv. $\frac{1}{2}$ min.	10	42	C. Compare	44 52.3	13 40.5			
CAPE PROMON- TORE.	1 F.	15	111	Porer Rock, a mile S.W. of the Cape	44 45.2	13 53.4			
Fiume, Quarnero Gulf, Croatia.	1 F. <i>Red.</i>	4	28	Extremity of the outer Mole	45 18.7	14 25.5	Also two lights in the Town Clock Tower.		
Segna.	1 F.	8	-	Extr. of Maria Art Mole, S. side of Port	44 59.2	14 53.5			
Lossini Island.	1 F.	8	32	Port Cigale, S. side of entr., Madonna pt.	44 31.7	14 26.5			
SANSEGO ISLAND.	1	-	-	On the Island	44 30	14 18.5	<i>Building.</i>		
BLANCHE POINT.	1 Rev. cv. 3 min.	18	130	N.W. point of Grossa or Lun- ga Island	44 9.7	14 49.5			
Lucietta.	1	-	-	On the Island	43 37.5	15 34.5	<i>Proposed.</i>		
Lesina.	1	-	-	-	43 11	16 22			
LISSA ISLAND.	1 F. & Fl. cv. min.	12 Fl. 15	125	Premoutore pt., E. extreme of Island	43 4.2	16 15.3	Visible from about N. round W. and S. to S.E. by E. $\frac{1}{2}$ E. The limit of light passes $\frac{1}{2}$ mile north- ward of the small islets Vaeca and Vitelli, outside Port St. Giorgio.		
ROSSO PORTO.	1 F.	21	342	On Skrigeva pt. S. extreme, Lagosta Island	42 43.3	16 53.1			
Gravosa.	1	-	-	-	42 40	18 4.7	<i>Building.</i>		
CATTERO GULE.	1 F.	20	263	Punta d' Ostro	42 23.5	18 32.1			
Antivari.	1 F.	8	121	In Fort, within the Cape, S. side of entr.	42 2	19 6			
Durazzo.	1 F.	6	52	About 33 feet from Quay	41 17.4	19 27.3	<i>White</i> when bearing from E. $\frac{1}{2}$ S. to N.E. by E. $\frac{1}{2}$ E., <i>Red</i> from N.E. by E. $\frac{1}{2}$ E. to N. by E. $\frac{1}{2}$ E., and <i>White</i> from N. by E. $\frac{1}{2}$ E. to N. W. by W. $\frac{1}{2}$ W.		
Avlona or Valona Bay.	1 F. <i>Red.</i>	5	82	First point southward	40 24	19 27			
TIGNOSO.	1 F.	14	100	Summit of the Rock	39 48.2	19 57.5			
Corfu Harbour.	1 F.	18	240	Citadel	39 37.1	19 56.5			
Lefehimo Lt. V.	1 F.	6 to 8	20	N. part shoal in 5 fathoms	39 27.5	20 4	By keeping the Lt. V. N.N.W. $\frac{1}{2}$ W. dangers will be avoided.		
Paxo.	1 F.	15	369	Lakapt., N. end of Paxo Island	39 13	20 9			
"	1 F.	10	107	Madonna Id., in Port Gayo	39 11.5	20 12.3			
Santa Maura.	1 F.	9	54	On the Mole	38 50.5	20 42.9			
Ithaca.	1 F.	6	30	Andrea pt., E. side of entr. to Port Vathy	38 22.3	20 42.5			
"	1 F.	-	13	Lazaretto, Port Vathy	38 22.1	20 42.8			
KEPHALONIA OR CEPHALONIA.	1 F.	12	122	Guardiana Rock	38 8.2	20 26.5			
	1 F.	5	35	Hook pt., Port Argostoli	38 11.2	20 28.5			

1. Name Light
KEPHALONIA CEPHALONIA Misolonghi
Patras.
ZANTE.
"
Katakolo. SRIVALI
CERIGO IS.
"
Monemvasia SPEZZIA.
EGINA.
Themisto Cape.
Peiraeus Athens
Lipso Isl. SYRA.
" Zea.
ANDROS Doro I.
Canal de pont
"
VOLO G.
"

8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Fect.		° N.	° E.		H. M.	Ft.
		KEPHALONIA OF CEPHALONIA.	1 F.	-	17	Lixuri Port, on the Mole	-	-	} No dependence on their being lighted.		
		Misolonghi.	1 F.	10	-	W. pt. entrance to Lake, N.W. by W. $\frac{1}{2}$ W. 6 miles from Bakari point	38 19.5	21 23.2			
		Patras.	1 F. & Fl. ev. 2 min.	7	50	Mole Head	38 14.4	21 46.3			
		ZANTE.	1 F.	Sor9	93	Cape Krionero	37 48.6	20 54.3	} Light kept S.W. by S. leads to the westward of the Montague Rocks, and S.W. by W. $\frac{3}{4}$ W. leads to the eastward of them.		
		"	2 F. <i>Red</i> , Very faint.	6 each	30 each	Mole Head	37 47.4	20 54.5			
		Katakolo.	1 F. <i>Red</i> ,	4	33	Extr. of Jetty	37 39.2	21 20			
		STRIVALI IDS.	1 F.	12	127	Highest part Stamphani Id., S. of the Con- vent	37 15.2	21 1.2			

## GRECIAN ARCHIPELAGO.

CERIGO ISLAND.	1 Rev. ev. $\frac{1}{2}$ min	24	363	On Cape Spathi; 573 yds. from N. pt. of Island	36 22.8	22 57.5	Visible 258° from E. by N. $\frac{3}{4}$ N. round northward to N.N.W. $\frac{3}{4}$ W.
"	1 F.	8	91	E. side of Kapsali Bay	36 8.5	23 0.3	Visible only between N.N.W. and N.E. $\frac{1}{2}$ N.
Monemvasia.	1 F.	-	-	On the Cape	36 41.2	23 3.5	Occasionally.
SPEZZIA.	1 F.	10	93	Near N.E. pt. of Island	37 15.6	23 10	
EGINA.	1 F.	4	17	S.E. elbow of N. Mole	37 44.5	23 25.5	
Themistocles Cape.	2 F. Vertical.	3 each	43 33	27 yds. within the point	37 55.8	23 37.7	10 feet apart. Upper light <i>Red</i> and <i>White</i> , lower <i>Red</i> ; not vis. to the northward of N.W.
Peiraeus of Athens.	1 F. <i>Red</i> .	3	20	N. Mole Head	37 56.2	23 38.2	} 72 yards apart.
	1 F.	3	20	S. Mole Head	-	-	
Lipso Island.	1 Rev. ev. 2 min	17	184	N.E. part	37 56.4	23 35.7	
SYRA.	1 Rev. ev. min.	20	105	W. Mount, Gaidaro Island	37 25.5	24 58.8	
"	1 F. <i>Red</i> .	-	14	E. Mole	-	-	
Zea.	1 F. and Fl. ev. 2 min.	12	108	St. Nikolao, N. pt. of entrance	37 39.5	24 19.7	
ANDROS ISLAND, Doro Passage.	1 F. and Fl. ev. 3 min.	30	708	C. Passa, N.W. pt., about mile inland	37 57.5	24 42.5	Visible from S. $\frac{3}{4}$ W. round west- ward to N.E. by E. $\frac{1}{2}$ E. to clear the Kaloyeri Rocks.
Canal de Negro- pont	1 F.	-	-	C. Aia Marina, Berdoun Id.	38 11.1	24 5.9	<i>Proposed.</i>
"	1 F.	-	-	Bourzi Tower	38 22.7	23 39.5	<i>Proposed.</i>
VOLO GULF.	1 F. <i>Red</i> .	6	85	Cape Kavoulia.	39 6.2	23 3.5	
"	1 F. <i>Red</i> .	6	82	Cape Sesklo.	39 22.5	22 56.5	

## LIGHTS AND TIDES.—MEDITERRANEAN

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
SALONIKI GULF.	1 Rev. ev. min.	Miles 15	Feet. 52	On Point Kasandra	39 57.5	23 22		H. M.	Fe.
"	2 F.	8	52	Panomi point.	40 21.7	22 54.4	Vertical.		
"	1 F. <i>Red</i> and <i>White</i> .	10	85	On Cape Kara	40 29.5	22 49.7	<i>Red</i> from N. $\frac{3}{4}$ W. to N.E. $\frac{3}{4}$ N. by the N. <i>White</i> light kept in sight clears Touzla point.		
TENEDOS ISLAND	1 F.	14	95	Ponente, or W. point	39 50	25 58.7			
GADARO.	1 F. & <i>Red</i> Fl. ev. 2 min.	12	59	On Islet	39 50	26 6.2			
Cape Baba.	1	-	-	On Baba House	39 28.5	26 4.7	<i>Proposed</i> .		
Sivrigi Cape.	1 F.	6	82	110 yards from extremity	39 27.7	26 15.2			
MITYLENI ID.	1 F. <i>Red</i> .	6	-	Skammia, N.E. pt., 87 yards from extreme	39 23	26 22			
"	1 Rev. ev. $\frac{1}{2}$ min. <i>Red</i> .	24	180	Sigri Island	39 13	25 51.2			
"	2 F. <i>Red</i> .	4 each	23 each	N. & S. entrances to the Port	39 6	26 34.7			
"	1 F. <i>Red</i> .	6	164	Above the Fort, on Mityleni pt.	39 6.2	26 34.8			
Eleos Island.	1 F.	12	197	Summit	39 19.5	26 33.2			
SMYRNA GULF.	1 F.	20	230	Merminji Cape, 273 yds. from extreme	38 37	26 46.3	Visible <i>White</i> seaward, between S.S.E. $\frac{3}{4}$ E. and E. $\frac{3}{4}$ S.; <i>Red</i> between E. $\frac{3}{4}$ S. and N. by W. $\frac{1}{4}$ W. A F. light <i>Green</i> , below the above light, shows the direction of the Merminji Rocks		
"	2 F. <i>Green</i> .	5	52	Off Tani Kedesse, or Pelican Lt. V. in 10 fathoms	38 25.2	26 58.1	Vertical.		
"	2 F. <i>Red</i> .	5	49	Sanjak Kalessi, extreme point, 82 feet	38 25.1	27 1.9	Vertical.		
"	2 F. <i>Green</i> .	4	52	Sanjak Spit Lt. V. in 4 fathoms	38 25.2	27 2.1	Vertical.		
PASHA ISLAND.	1 Rev. ev. min.	15	246	E. point	38 30.3	26 18.3			
KHIOS.	2 F. <i>Red</i> .	4 each	52	Port Kastro, N. side of entr.	38 22.7	26 9.2	Vertical.		
Paspargo Island.	1 F.	12	118	On the Island	38 17.9	26 12.8			
Scala Nuova.	1 F.	6	98	W. pt. of entr.	37 51.5	27 16.6			
SAMOS ISLAND.	1 F.	6	131	Vathi Port, E. entrance	37 46.3	26 59.2			
"	1 F.	6	72	Tigani Port, E. side.	37 41	26 56.6			
Kalolimno Id.	1 Rev. ev. min.	10	180	394 feet of E. extremity	37 3.5	27 7.4			
Hussein Point.	1 F. <i>Green</i> .	5	82	180 feet within the point	36 57.5	27 17.2			

1. Name of Light.
KOS ISLAND.
RHODES.
"
CANDIA.
"
"
"
"
Koum Ka
HELLAS.
Seddul B.
Khepez, Barber Kihid Bah
Chanak.
Nagara P.
Bovali K.
Piskieri.
Galata.
Chardakl.
Northern
Kutali R.
Pafio.

LIGHTS AND TIDES.—MEDITERRANEAN.

69

1.	2.	3.	4.	5.	6.		7.	8.	9.	
					Position.					
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.	
M.	Ft.	Miles	Feet.		° N. /	° E. /		H.	M.	Ft.
KOS ISLAND.	1 F. <i>Red.</i>	5	59	492 feet within Koum point	36 55	27 18.3				
RHODES.	1 F. <i>Red.</i>	4	52	Koum Bournou or Moliuo pt.	36 27.2	28 15.7				
"	1 Rev. ev. min.	15	118	Tower of St. Elmo	36 26.7	28 16.3				
CANDIA.	1 F.	10	75	Khania, E. Mole Head	35 30.8	24 1.4				
"	1 F. & Fl. ev. min.	15	197	Cape Drepano	35 28.2	24 14.6				
"	1 F. <i>Green.</i>	6	82	Suda, in the Fortress	35 28.8	24 9.3				
"	1 F.	10	50	Rithymno	35 22	24 29.2				
"	1 F.	10	52	Megalo-Kastron (on the Mole)	35 21	25 8.8	Almost a decoy, being rivalled by brighter lights.			
"	-	-	-	Paleo Kastro	-	-	<i>Proposed.</i>			

DARDANELLES, AND SEA OF MARMORA.

Koum Kaleh.	2 F. <i>Red.</i>	4	50	W. Battery, S. side Dardanelles	40 0.2	26 12.4	Vertical. At a distance of 13 miles they combine and form one light.		
HELLAS.	1 Rev. ev. min.	18	99	On the Cape	40 2.3	26 11.2			
Seddal Bahr.	2 F. <i>Green.</i>	4 each	52	S. pt. of Fortress	40 2.3	26 12.1	Vertical.		
Khephez, or Barber's Pt.	1 Rev. ev. 1/2 min. <i>Red.</i>	12	59	Near the Battery in ruins	40 5.3	26 22.2			
Kilid Bahr.	2 F. <i>Green.</i>	4 each	36 20	Namaziah Fort	40 8.5	26 23.2	Vertical.		
Chanak.	2 F. <i>Red.</i>	4 each	66 46	Low Battery, W. side of the town	40 8.5	26 24.7	Vertical.		
Nagara Point.	1 F. & <i>Red</i> Fl. ev. 10 s.	10	39	On the Tower	40 11.5	26 25			
Bovali Kalessi.	2 F. <i>Green.</i>	4 each	46 26	On the Fortress	40 12.5	26 24	Vertical.		
Piskieri.	2 F. <i>Red.</i>	4 each	56	On the Cape	40 16.7	26 34.2			
Galata.	2 F. <i>Green.</i>	4 each	62 42	1 1/2 miles S. of village	40 19.1	26 35.5			
Chardakh.	2 F. <i>Red.</i>	4 each	59 39	On Low Sandy point	40 23	26 41.1			
Northern end.	1 Rev. ev. 1/4 min	18	108	Gallipoli, W. shore	40 24	26 39			
	1 F.	-	-	Famous point, E. shore	40 24	26 44.3	Uncertain.		
Kutali Road.	1 F.	10	49	On a Rock, off Araplar Id.	40 30.6	27 29			
Palio.	2 F. <i>Red.</i>	5	138	Artaki Peninsula, W. pt.	40 29.4	27 40.7	Vertical. N. entrance of Rhoda Channel.		

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Marmora Island.	1 F. & Red Flsh. ev. 2 min.	Miles 12	Feet. 132	Fenar Adasi Isle (off E. point of Marmora)	40 37.7	27 46		H. M.	Ft.
KHORAZ.	1 F. and Fl. ev. $\frac{1}{2}$ min.	22	180	Summit of Cape	40 41.2	27 17.2			
Erekli.	1 F.	11	164	On the point	40 58.5	27 58.2			
STEPHANO BURN.	1 F. & Fl. ev. 2 min.	12	79	About a mile N. E. of the Cape	40 57.3	28 50.6	Visible from E. by N. $\frac{1}{4}$ N. round southward to W. $\frac{1}{4}$ N.		
FARNAR BAY.	1 F.	12	84	S. point	40 58	29 2			
CONSTANTINOPELE	1 F. & Fl. ev. min.	15	150	Seraglio point	41 0.2	28 59.4	Visible from N. $\frac{1}{2}$ E. round eastward to W.S.W.		
Skutari.	2 F. Red.	4 each	79 59	Leander Tower	41 1	29 0.7			
ISMID GULF.	1 F. Green.	5	40	Dil Burnu	40 43.2	29 32.2			
..	1 F. Red.	6	33	Zeitin Burnu	40 43.5	29 50.2			

## BOSPHORUS.

Tofana.	1 F.	-	-	On the Rock	41 1.3	29 0.2	A small light.		
Pilon de Sultan Serail, 60 yds. from Quay.	2 F. Green.	4 each	39	Defterdar and Kourou Teche-smeh villages	41 3.1	29 2.3	Vertical.		
Kandilli.	2 F. Red.	4 each.	112	On the point	41 4.2	29 3.4	Vertical.		
Roumili Hissar.	2 F. Green.	4 each	46	On Fortress Wall, 110 yds. from Gd. ho.	41 4.8	29 1.7	Vertical.		
Khanlijeh.	2 F. Red.	4 each	92	On the point, 110 yds. from shore	41 5.9	29 4	Vertical.		
Yeni Keni Lt. V.	3 F. Green.	4 each	46	On the edge of the Bank	41 7.2	29 4.4	Triangular.		
Umur Banks Light Vessel.	3 F. Red.	4 each	46	Western edge.	41 9.3	29 4.7	Triangular.		
Therapia (1 mile N.W. by W. of)	2 F. Green.	4 each	46	Kefali Keni Battery	41 8.6	29 3	Vertical.		
Jeron Point.	2 F. Red.	4 each	46	Kavak Fort, outermost pt.	41 10.5	29 5.1	Vertical.		

## BLACK SEA.

MOUTH OF THE BOSPHORUS.	1 F.	18	190	Roumili, European side	41 14.2	29 7			
..	1 F. & Fl.	20	249	Anatolia, Asiatic side	41 12.8	29 8.5	A Red flash followed by two White ones ev. 2 min.		
KARA BURUN.	1 Fl. ev. 10's.	22	302	On the Cape	41 19.2	28 41			
Burghaz Bay.	2 F.	6	131	Anastatia Id.	42 27.9	27 35.9	Vertical.		



LIGHTS AND TIDES.—MEDITERRANEAN.

71

3. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
M.	Ft.			Miles	Fect.		° N.	° E.				
		Varna Bay.	1 F.	10	164	C. Galata	43 10	27 58.6				
		"	1 F. <i>Red.</i>	4	49	On wall of town	43 11.7	27 58.3				
		C. Shablah.	1 F.	8	120	Beacon Tower	43 33	28 38.7				
		Kustenjeh.	1 F.	9	68	On the Cape	44 10.3	28 39.2				
		DANUBE RIVER.	1 Rev. ev. min. <i>Red &amp; White</i>	10	-	St. George's Mo.	44 51.1	29 36.9	Situated on islet, south end of Olinka Island.			
		"	1 F.	15	65	Sulina, or mid- dle entrance, S. side	45 9.4	29 40.5				
		"	1 F.	10	-	On inner ex- tremity, S. side	45 9.1	29 40.6				
		"	1 F.	6	-	N. side	-	-				
		FIDONISI, or Ser- pent Island.	1 Rev. ev. ½ min.	18	195	On the summit	45 15.6	30 12.7				
		Dniestr River.	2 F.	4	58	S. pass	46 4.7	30 27.2				
		ODESSA.	1 F.	21	201	Cape Fontana, about 2 leagues S. of the town	46 22.8	30 45.4				
		"	1 F. & <i>Red Fl.</i> ev. min.	12	44	End of Quarant- tine Mole	46 29.4	30 44.9	A <i>Yellow</i> flag by day.			
		Berezan.	2 F.	-	-	W. side of the Lake	46 38.2	31 23.5	Extinguished during winter. S.E. ½ E. & <i>v.c.</i> , 594 yards.			
		Kinburn Beacons	2 F.	-	57 9	N.W. of the Fort	46 33.9 46 35.5	31 30.2 31 28.9	W. by S. ½ S. & <i>v.c.</i> , 1600 yards.			
		Ochakov.	2 F.	166 108	-	On the point	46 36.7	31 31.7	W. S.W. & <i>v.c.</i> , 584 yards.			
		Kinburn Lt. V.	1 F.	-	-	E. entrance to Ship Channel	46 36	31 41.7				
		Adjigiol Lt. V.	3 F.	12	46	Extremity of shoal	46 35.7	31 48	In 18 ft. water; lts. are vertical.			
		BUG RIVER.										
		Russkaia Spit (extreme)	1 F.	-	33	Near Sviatoto- itski village; left bank of river.	-	-	Vessels entering the Bug should keep within the limits of this lt. until Voloiskaia light is seen. They will thus avoid the banks extending from both sides of the river.			
		Voloiskaia Spit.	1 F.	-	69	Under the first ravine, north of Voloiskaia Spit; right bank of river	46 44.5	31 53.7	Russkaia and Voloiskaia Spits are avoided when within the limits of this light.			
		TENDRA ISLAND.	1 Rev.; a flash ev. min.	16	96	On the point	46 22.4	31 31.6	A Fog-bell. A temporary light lies 3¼ miles to the southward.			
		TARKAN.	1 F.	12	116	S.W. extr. of Cape, 105 feet from the sea	45 20.9	32 28.4	Visible from S.S.E. ¼ E. to N.N. W. ¾ W. by the westward.			
		EUPATORIA, OR KOSLOV.	1 F. & Fl. ev. min.	9	53	On the point	45 9	33 15.2	<i>Red</i> and <i>White</i> flashes alternately.			
		KHERSONESE.	1 Rev.; a Fl. ev. min.	12	108	On the Cape, at the entrance to Sevastopol	44 35	33 21.2				

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
					Lat.	Long.		H.	M.	Ft.	
SEVASTOPOL.	1 F.	Miles 28	Feet. 305	On a high cape, near the ruins of Inkerman	° N. 44	° E. 37.2	E. by S. and W. by N. 1 3/4 miles. Screened so as to show only in the line of the course up the harbour of Sevastopol.				
"	1 F.	23	629	Head of Harb., near Mekenzieff Mount	44	37		33 37.7			
AITODOR.	1 F.	21	343	On the Cape	44	25.5	34 6.2	Visible between the bearings of W. to N.E. by the southward.			
TAKLI.	1 F.	20	313	On the Cape, entrance to Kertch Strait	45	6.5	36 26.2	<i>Pale</i> colour light.			
CAPE PAUL.	1 F.	14	73	On the Cape, W. side of Strait	45	18.2	36 29.7	<i>White</i> when bearing N. 1/4 E. to N.N.W.; <i>Red</i> from W. by N. 1/4 N. to W. by S. 1/4 S.			
Kertch.	1 F. <i>Red.</i>	.	33	On the Town Wharf	45	21.2	36 28.5	Visible between S. 44° E. and S. 74° E. from the light.			
Soukhoum.	1 Rev. ; a Fl. ev. min.	17	121	On the point	42	58.5	40 57.2				
POTI.	1 Fl. ev. min. <i>Red &amp; White</i>	17	118	"	42	9.1	41 36.7				
Batoum Bay.	2 F. Vertical.	6	49	W. side	41	39.5	41 37.3	When bearing S S.W. 3/4 W. clears Palamida Reef.			
TREBIZOND.	1 F.	10	105	Kalmek point	41	1	39 45.8				
Kerasounda.	2 F. Vertical.	6	194	N.E. part of pt.	40	56.3	38 24.9	When bearing S.S.W. 3/4 S. leads clear of the Palamida Reef.			
Samsoun Bay.	1 F.	10	56	Kalion point	41	18.2	36 21.2				
Sinouh.	1 F. <i>Red.</i>	8	344	Boztepeh point	42	1.3	35 14.2				
Injeh.	1 Rev. ev. min.	13	92	On the Cape	42	6	34 58.5				
Ineboli.	2 F. <i>Red.</i>	4	85	On the Cape, E. side	41	58.5	33 45.2				
Amastra.	1 F. <i>Red.</i>	10	312	Summit of Peninsula	41	45.3	32 20.5				
Bender Erekli.	1 F.	12	656	Cape Baba, 1/4 mile N. of Cape	41	18	31 26.6				
KILI.	1 Rev. ev. min.	25	221	On the Cape	41	10	29 38.2				

## SEA OF AZOV.

YENI KALEH.	1 Rev. ; a flash ev. 1/4 min.	25	409	Cape Fanar, N.W. entr. of Kertch Strait, and 2 1/4 miles from Yeni Kaleh Fortress	45	23.2	36 38.3	Visible from N.N.W. to S.W. 1/4 S.			
Berdiansk.	1 Rev. ev. min.	10	85	On a sandy neck of land, 600 yds. E.N.E. 1/4 E. from the extremity of Spit	46	38.5	36 46.1				
"	1 F.	.	15	Extremity of Breakwater	46	45.3	36 47	The Breakwater extends to 14 ft. depth. When from the violence of the sea this light is not exhibited a vessel moored inside the middle part of the Breakwater, about 35 yds. from shore, will exhibit <i>two fixed</i> lights, one 13 the other 10 feet above the sea.			

LIGHTS AND TIDES.—MEDITERRANEAN.

73

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
					Lat.	Long.		H.	M.	Ft.	
Bielosarai.	1 F.	Miles 10	Feet. 74	On a sandy neck 2400 yds. from the extremity of Spit	46 53.2	37 20	Visible round the Compass.				
Sazalitzk Lt. V.	2 F. Vertical.	6 7	45 35	S. side of Chan., end of Spit, in 34 fathoms	46 59.3	38 12.5	Removed during winter to Tagaurog.				
Golden Bank Light Vessel.	1 F.	7	45	Two miles from the shoal, in 16 ft., and S. S. W. of Foursoff village	47 1.4	38 34.4	Removed during winter to Tagaurog. Visible from E. $\frac{1}{2}$ N. to W. N. W. $\frac{1}{4}$ W. by the southward.				

KARAMANIA AND SYRIA.

Lissan el Kahbeh	2 F.	6	upper 49	Low sandy pt., 164 yards from extremity	36 14.5	34 1.7				
Mersina.	1 F. & Fl. ev. 2 min.	14	49	$\frac{1}{2}$ mile to the S. W. of Mersyu	36 45.8	34 40.7				
Kara-dash Burnu.	1 F.	8	131	-	36 32.7	35 21.3				
Alexandretta.	2 F.	5	upper 49	W. pt. of Road, 22 yards from the point	36 35.5	36 9.1	When mail steamers are expected.			
CYPRUS ISLAND.	1 F. & Fl. ev. 2 min.	15	190	Cape Gata	34 33.7	33 2.4				
„	1 F.	8	92	Kiti, 90 yards from the Cape	34 49	33 36.8				
„	1 F. Red.	4	46	Laruaka, 165 yards from Lazaret	34 55	33 38.9				
Ras Ibn Hani.	1 F. & Fl. ev. min.	13	46	66 yards within the point	35 35	35 43.7				
Latakiyah.	1 F. Red.	4	49	N. part of the old Castle	35 31.2	35 45.6				
Tripoli.	1 F. Red.	5	56	Ramkine Islet	34 30	34 45				
BEIRUT.	1 Rev. ev. min.	12	125	437 yds. within the Cape	33 54.2	35 27.7				
„	1 F. Red.	4	59	At the Port, El Allah	-	-				
Akka.	1 F. Red.	10	46	On ramparts, W. of town	32 55.4	35 3.7				
MOUNT CARMEL.	1 F. & Fl. ev. 2 min.	18	410	Below the Monastery	32 48	35 2				
Haifa.	2 F. Vertical.	5	upper 66	On the old Castle	32 49.2	35 0				
Yafa.	1 Rev. ev. min.	14	169	S. W. part of town, 100 yds. from sea	32 3.2	34 44.8	Alternate Red & White flashes.			

L

## LIGHTS AND TIDES.—MEDITERRANEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## NORTH COAST OF AFRICA.

		Miles	Feet.		N. E.			H. M.	Ft.
					°	'			
Port Said.	1 F.	9	66	On the Beach, entrance to Canal	31 16	32 19.5			
Nile River.	1	-	-	Damietta Mouth	31 25	31 47.1	<i>Proposed.</i>		
"	1	-	-	Rosetta Mouth	31 24.2	30 28.1	<i>Proposed.</i>		
ALEXANDRIA.	1 F.	20	180	Enostos point	31 11.1	29 52.4			
DERNA.	-	-	-	-	32 45	22 40	<i>Proposed.</i>		
Benghazi.	-	-	-	-	32 9	20 1	<i>Proposed.</i>		
Tripoli.	-	-	-	-	32 54	13 12	<i>Proposed.</i>		
TUNIS GULF.	1 Rev. ev. min.	15	406	Cape Carthage	36 52	10 19.2			
"	1 F. <i>Red.</i>	6	39	Goletta, extr. of E. Jetty, Starboard side	36 48.3	10 18.7			
AL KHELB ROCKS.	1 F.	17	129	Summit of high- est rock	37 21	10 4.6	Visible round the horizon.		
Al Kalah.	1 F.	10	52	E. side of entr.	36 54	8 26.2			
Rosa.	1	-	-	On the Cape	36 57	8 13.6	<i>Proposed.</i>		
Bonah.	1 F.	10	160	Lion point, $\frac{3}{4}$ mile E. of Port	36 54.5	7 46.4			
"	1 F. <i>Red.</i>	-	-	Cigogne point	36 53.9	7 45.7	A fixed light also on Genois Fort.		
HAMRAH.	1 Rev. ev. $\frac{1}{2}$ min.	15	466	On the Cape	36 58.1	7 47	Eclipses not total within 8 miles.		
Stora Gulf.	1 F.	8	118	Singes Isle	36 54.2	6 51.5	Surrounded by a battery. A small F. Lt., visible 4 miles, indicates the position of Philippeville.		
"	1 F.	10	180	Serigina Isle	36 56.3	6 52.7			
Kolah Gulf.	1 F. & <i>Green Fl.</i> ev. 2 min.	12	78	Extreme of El Djerda Penin- sula	37 1.4	6 32.6			
"	1 F. <i>Red.</i>	-	-	S. side of entr. to the Port	37 0.8	6 32	Visible from eastward and S. E.		
Jijelli.	1 F.	8	49	On the second rock	36 50	5 43.9			
Bougie.	1 F. <i>Red.</i>	3	128	Entr. of Port, on Fort Abdel- Kader	36 45.5	5 5.3			
Bouae Cape.	1 F.	8	482	On the Fort, a mile N. E. $\frac{1}{4}$ E. of Bougie	36 46	5 6.1			
CARBON.	1 Rev. ev. min.	27	722	On the Cape	36 46.9	5 6.2			
BENGUT.	-	-	-	On the Cape	36 57	3 56	<i>Building.</i>		
Dellis.	1 F.	8	-	Extreme of pt.	36 55.5	3 55.1			
MATIFU.	-	-	-	On the Cape, E. side	36 59	3 15	<i>Building.</i>		

ALGER.

"

Caxine.

Tipaza.

SHERSHE

Tenez.

"

IVL

Mostagh.

Arzew.

"

ORAN.

CAPE FA

DEAUME

HARRAS

NEMOUR

Djama

ouat.

Melilla.

Al-Khu

CEUTA.

CAPE S

LIGHTS AND TIDES.—MEDITERRANEAN.

75

1.	2.	3.	4.	5.	6.		7.	8.	9.
					Position.				
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
		Miles	Feet.		N.	E.		H. M.	Ft.
ALGIER.	1 Rev. ev. ¼ min.	15	115	Algiers Islet,	36 47 3	3 4 3			
"	1 F. <i>Red.</i>	3	36	De La Marine	36 47	3 4 6			
"	1 F. <i>Green.</i>	3	25	N. Mole Head	36 46 9	3 4 4			
Caxime.	1	-	-	S. Mole Head	36 50	3 1 2	<i>Building.</i>		
Tipaza.	1	-	-	Point Pescade	36 36	2 -	<i>Building.</i>		
SHREWSBURY PORT.	2 F.	15	124	Fort Joinville,	36 36 8	2 11 8			
		3	26	and on the Pier					
Tenez.	1 Rev. ev. ¼ min.	27	-	On the Cape,	36 33 1	1 20 3	Eclipses not total within 12 miles.		
				2 4-10 miles northward of Tenez					
"	1 F.	8	131	In front of the town	36 32	1 20 1			
IVI.	-	-	-	On the Cape	36 6	0 11 5	<i>Proposed.</i>		
Mostaghanem	1 F.	10	121	On a small tower near the Barracks	35 55 1	0 5 4	West		
Arzew.	1 F.	8	43	In Fort, on S.W. angle	35 51 6	0 17 2			
"	1 F.	10	66	On the Islet	35 52 4	0 16 8			
ORAN.	1 Rev. ev. ¼ min.	15	121	Extremity of the Jetty of the Basin, on Fort Merselkebir	35 44 3	0 41 3	Eclipses not total within 8 miles. A small F. <i>Red</i> light, visible 3 miles, indicates the entrance to the Basin for disembarkation		
CAPE FALCON.	-	-	-	On the Cape	35 47	0 48	<i>Building.</i>		
DIACMEL.	-	-	-	On the Cape	-	-	<i>Building.</i>		
HABIBAS.	-	-	-	Centre Island	35 43	1 8	<i>Building.</i>		
NEMOURS.	-	-	-	Cape Hone	35 8 8	1 50	<i>Building.</i>		
Djama Ghazaouat.	1 F.	8	276	E. point of Bay	35 7	1 52 3			
Melilla.	1 F.	5	-	Bastion, N.E. of village	35 18	2 57			
Al-Khuzemas.	1 F.	7	123	Torre Vigia	35 13 4	3 53			
CEUTA.	1 Rev. ev. min.	23	476	Mosqueros Hill.	35 53 9	5 17 5		2 6	31
CAPE SPARTEL.	1 F.	20	312	On a Rock ¼ mile eastward of the Cape	35 47 2	5 55 7			

W. & C.

9. Rise of Springs.

M.

Ft.

## LIGHTS AND TIDES.—ATLANTIC OCEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## AZORES, OR WESTERN ISLANDS.

St. Michael.	1 F.	Miles 10	Feet. -	Santa Clara, Fort Punta Delgada	° N. , ° W. ,		<i>Proposed.</i>	H. M. 12 30	Ft. 6
					37 4.4	25 4.0			

## CANARY ISLANDS.

TENERIFFE ID. Santa Cruz.	1 F. <i>Red.</i>	4 or 5	36	Mole Head	28 28.3	16 14.9			
"	1 F.	9	34	55 yards from Mole Head	28 28.5	16 14.9	- - - - -	- - - - -	8 1/2
ROQUE BERMEJO	1 F. and Fl. ev. 3 min.	35	810	On the point	28 35.4	16 8.1	Illumines an arc from Drago point to the Anaga Rocks.		
GRAN CANARIA ISLAND. Palmas.	1 F.	-	-	On the Mole	28 7.1	15 24.8	- - - - -	12 30 ?	9 ?
ISLETA POINT.	1 F. ; a <i>Red</i> Fl. ev. 2 min.	18	817	N. and highest summit, Isleta Peninsula	28 11	15 25.3	Visible through an arc of 257° or from N. 73° W. to S. 4° W. It will be seen also from Palmas roadstead.		
FUERTEVENTURA ISLAND. JANDIA POINT.	1 Rev. ev. min.	15	108	S.W. extreme of Island	28 3	14 31.4	Visible through an arc of 274°, or when bearing from S.S.W. $\frac{3}{4}$ W. to N.W. by W. $\frac{1}{2}$ W. A wide berth should be given to the point.		
LOBOS ISLAND.	1 F. <i>Red.</i>	9	95	Summit of Mar- tin pt., N. end of Island	28 45.4	13 49.1	Illumines 270°, the whole of Bocayna Strait, or from N. 76° W. to S. 14° W.		
ALEGUANZA ID.	1 Rev. ev. $\frac{1}{4}$ min.	13	57	Delgada point, 240yds. within the rocks at extremity	29 23.8	13 29.6	Arc of visibility, 270° or between N. 25° W. and S. 65° W.		

## BERMUDA ISLANDS.

South end of Id.	1 Rev. ev. 6 or 8 s.	24	365	Gibb's Hill	32 15.1	64 51.6	Within 7 miles a faint light can be seen between the brilliant flashes. The light is intercepted by hills between N. 43° 24' E., and N. 47° 34' E., and between N. 49° 7' E., and N. 57° 35' E. (true bearings.)	7 14	4
------------------	----------------------	----	-----	-------------	---------	---------	--	------	---

LIGHTS AND TIDES.—ATLANTIC OCEAN.

77

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			

AFRICA.—WEST, SOUTH, AND EAST COASTS.

H. M.	Ft.					° N.	° W.		H. M.	Ft.	
12 30	6		Miles	Fect.					8 42	6	
		Senegal.	1 F.	6	-	Ile de St. Louis, Government House	16 0·8	16 31	- - - -		
		Cape Verde.	1 R. ev. ½ min.	-	-	Westhill, on Cape	14 44·1	17 32	Uncertain.		
		Goree Island.	1 F.	6	-	In the Fort, Summit of Id.	14 39·9	17 24·8	- - - -	7 45	2½
		Gambia River.	1 F.	10	70	Cape St. Mary	- -	- -	S.W. by W. ½ W. 6½ miles from <i>black</i> buoy on African Knoll.	8 10	6 to 9
		„	1 F. <i>Red.</i>	6	35	Fort Bullen, Barra point	13 30	16 34	S. by E. ½ E., 5¾ miles from <i>black</i> buoy on African Knoll.		
	8½	SIERRA LEONE.	1 F.	18	96	On the Cape	8 30	13 18·5	- - - -	7 55	8
		MONROVIA.	1 F.	15	240	Cape Mesurado	6 19	10 50	- - - -	6 0	6
		CAPE PALMAS.	1 F.	13	100	On the Cape	4 22·1	7 44·3	- - - -	4 30	4
		CAPE COAST.	1 F.	20	192	Fort William, 600 yds. inland	5 6·3	1 13·9	Visible from N. E. to N.W.	4 30	6
		St. Paul de Loando.	1 F. (Lt. Vessel)	-	-	N E. end of Loando Reef	13 44·9	13 16·2	Vessels should pass to the north- ward of this Lt. V.	4 30	5

SOUTH AND SOUTH-EAST COASTS OF AFRICA.

		TABLE BAY.	1 F.	20	154	Robben Island, Minto Hill, highest part	33 48·9	18 22·5	Visible round the horizon.		
		„	1 F. <i>Red.</i>	10	44	Mouille point, 100 yards from L. W.	33 53·9	18 24·8	E. by S. ½ S., 1195 yards from Green Point light.		
		„	1 F. & Fl. ev. 10 s.	13	65	Green point, 400 yds. from L. W.	33 54·1	18 24	- - - -		
		„	1 F. <i>Green.</i>	-	25	Staging of Breakwater	- -	- -	Visible from S. to N. by the west.	2 40	5
		„	1 F. <i>Red.</i>	-	-	Commencement of N. Jetty	- -	- -	To guide Vessels to the anchorage.		
		„	1 F. <i>Green.</i>	-	-	Old S. Jetty	- -	- -	Lighted only in northerly gales.		
		CAPE OF GOOD HOPE.	1 Rev. bright lt. for 12 s. ev. min.	36	816	On the Cape pt.	34 21·2	18 29·5	Visible round the horizon, except between S.S.W. and S. ½ E., also between S.S.E. ¼ E. and S.S.E. ¾ E. A signal station near the lighthouse.		
7 14	4	SIMONS BAY.	1 Rev. bright lt. for 12 s. ev. ½ min.	12	54	South Roman Rock, covered at H. W.	34 10·7	18 27·5	N.N.E. ¾ E., 1¾ cables from light- house lies the Caistor Rock with only 15 ft. on it, and patches of 19 and 24 ft. intervening; the shoalest spot is marked by a beacon with a flag. Eelsey Peak and lighthouse in line N. ¾ W. lead between the Whittle Rock and Miller Point.	2 44	5½

## LIGHTS AND TIDES.—INDIAN OCEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.	
					Lat.	Long.		H.	M.		Ft.
CAPE AGULHAS.	1 F.	Miles 18	Feet. 128	On the point	34 49·8	20 0·6	Visible from S.E. by E. round to W. In coming from the eastward, if the light bears to the westward of W. by N., the vessel should be kept to the southward to bring the light on that bearing before it is approached within 6 or 7 miles.	H. 2	M. 50	Ft. 5	
MOSSEL BAY.	1 F. <i>Red.</i>	12	240	Cape St. Blaize	34 11·2	22 9·5	- - - - -	3	30	6	
ALGOA BAY.	1 Rev. ev. min.	15	93	Cape Recife	34 1·7	25 42·1	Visible seaward between E. and S.				
"	1 F.	12	225	Behind Port Elizabeth, S. $\frac{1}{2}$ E., 25 yds. from Donkin's Monument.	-	-	From N.W. to N.W. by W., and from S.W. to S.W. by W. <i>Red.</i> From N.W. by W. to S.W. by W. <i>White</i> , which kept in sight clears all dangers. The Mariner is cautioned not to mistake this light for that on Cape Recife.	4	0	4 to 5	
BIRD ISLANDS.	2 F.	10	51 61	South side, on an incline, 6 yards apart (1 Tower)	33 50·4	26 17·2	When seen vertically they point to the Doddington Rock S.W. $\frac{3}{4}$ W. The upper light is invisible between S. by W. $\frac{1}{4}$ W. and W. by S. $\frac{1}{4}$ S.	4	0	4 to 5	
Buffalo River, East London.	1 F.	11	45	On the Reef, S. side of entr.	33 0·7	27 58·7	- - - - -	3	45	4 $\frac{1}{2}$	
NATAL.	-	-	-	On the Bluff, S. side of entr.	29 52·7	31 3	<i>Building.</i>	4	30	6	
"	-	-	-	On end of the Wall	-	-	<i>Proposed.</i>				
<b>REUNION.</b>											
St. Paul's Bay.	1 F.	7	72	Landing Place	20 59·7	55 19·3	- - - - -	1	7	4	
St. Denis.	2 F. Vertical.	8	85 73	On the Barachois	20 51·5	55 30·2	Beyond 5 miles the lights appear as one.	0	22	2 $\frac{1}{2}$	
BEL-AIR.	1 F.	18	151	On the point	20 53·2	55 39·4	- - - - -				
<b>MAURITIUS.</b>											
St. Louis.	1 F. <i>Green.</i>	-	-	Fort Cumberland, on Tonnelier Island	20 9·5	57 30·2	A Vessel closing the <i>Red</i> Lt. on a S.S.W. bearing should anchor when the <i>Green</i> Lt. bears S.E. $\frac{1}{4}$ S.	12	30	3	
"	1 F. <i>Red.</i>	-	-	Martello Tower, entr. of Grand River	20 11	57 28·5	A new lighthouse <i>proposed</i> to be built on the site of Cumberland Fort, which is razed.				
Cannonier Point.	1 F.	10	38	N.W. angle, extreme of pt.	19 59·7	57 32·5	Appears <i>Red</i> when bearing to the northward of N.E. $\frac{1}{4}$ E. as a warning to the Mariner.				
Flat Island.	1 Rev. ev. min. Brt. Lt. ev. 40 s.	25	370	S.W. angle	19 52·6	57 39·1	- - - - -				
Grand or Bourbon Port.	1 F.	16	108	He-aux-Fourquets, S. entr. 880 yds. E.N. E. of Ile de Passe	20 24·3	57 47·1	Visible in every direction seaward	1	0	1 $\frac{1}{2}$	



LIGHTS AND TIDES.—INDIAN OCEAN.

79

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			

H. M.	Ft.
2 50	5
3 30	6
4 0	4 to 5
4 0	4 to 5
3 45	4½
4 30	6
1 7	4
0 22	2½
12 30	3
1 0	1½

ARABIA.—S. COAST.

		Miles	Feet.		° N.	° E.		H. M.	Ft.
Aden Lt. V.	1 F.	7	35	S. side Chan., Inner Harb., in 4 fathoms	12 47	45 1-2	Fires a gun and burns a <i>Blue</i> lt. on a vessel entering. A <i>very</i> bad light.	7 30 to 9 30	7 to 8½

RED SEA.

Perim Island.	1 Rev. ev. 4 min	22	241	1100 yards S.W. of the N.E. bluff	12 40-3	43 25	- - - - -	12 0	7
Dadalus Shoal.	1 F.	14	61	On the Shoal	24 55-5	35 52	- - - - -	6 0	3
Jubal Strait.	1 Rev. ev. min.	18	125	Ushruffi, or Ashrafi Reef, N.E. part	27 47-5	33 42-3	- - - - -	6 14	2
Zafarana.	1 F.	14	83	On the point	29 6-3	32 44	- - - - -	-	-
Suez Lt. V.	1 F.	6	-	Off Gad ul Mur- kub point, E. side of Harb.	29 54-8	32 33	- - - - -	2 0	6

INDIA.—WESTERN OR MALABAR COAST.

KARACHI.	1 F.	16	120	Fort Manoro pt. W. entrance	24 47-3	66 58	- - - - -	10 30	9½
Mandavee, entr. to Gulf of Kutch	1 F.	10	80	S.W. Bastion of Fort	22 50-3	69 20-8	Maintained by the Rao of Kutch.	11 50	15
CAMBAY GULF.	1 F.	12	66	Perim Island	21 35	72 19-7			
"	1 F.	-	-	Gogah	21 40-5	72 16-5	A small light.		
"	1 F.	10	48	Koon Bunder, West bank of river	22 17	72 18-3	From 1st September to 15th June.		
"	1 F.	10	50	N. bank Dhar- dur River.	21 55	72 30-5	From 1st September to 15th June.		
"	1 F.	-	-	Bogwa	21 19-7	72 35			
"	1 F.	10	61	Taptee, near Vaux's Tomb	21 5-5	72 37-5			

## LIGHTS AND TIDES.--INDIAN OCEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
		Miles	Feet.		° N. ,	° E. ,		H. M.	Ft.
BOMBAY.	1 F. (Lt. Vessel)	9	36	S.S.W. 4½ miles from Colaba pt., and S.W. by S. ¾ mile from the Fair- way Buoy	18 50	72 47.5	A <i>Blue</i> light is burnt every hour, and a torch every half-hour. A <i>Red</i> flag shown when a vessel is seen: Guns are fired when a vessel is seen standing in danger.		
..	1 F. (Lt. Vessel)	-	-	¼ mile to the S. of the Sunken Rock (Shannon)	18 53.5	72 50	A <i>Red</i> flag when a vessel is seen.		
..	1 Rev. ev. 2 min.	17	132	Colaba point	18 53.7	72 48		11 40	12 to 17
..	1 F.	2	20	Dolphin Rock	-	-	<i>Green</i> light to the S. and E., <i>White</i> to the northward, screened to the westward.		
Kenery Island.	1	-	-	-	-	-	<i>Proposed.</i>		
Goa.	1 Rev. ev. 7 min.	12	280	Agnada Upper Fort	15 29.4	73 45.5	On a hill above landing place, about a mile from the outer Port.	11 30	6
SEDASHIGUR BAY.	1 F.	10	160	Summit of outer Oyster Rock	14 49.2	72 2.7	Light to be made visible 20 miles. As the Oyster It. is approached by steamers a <i>Red</i> light should be seen on the shore of the bay, and when it bears E.S.E. steer for it, and anchor in about 5 fathoms. Sailing vessels should wait till daylight at anchor in 8 fms. near the Oyster Rocks It.	9 30	7 to 8
Comta.	1 F.	12	180	Hill at mouth of Creek	14 25	74 22.5			
MANGALORE.	1 F.	14	250	Hill above the town	12 51.5	74 49.4	Visible on all points of the horizon to the westward.		
Camnanore.	1 F.	12	110	Fort	11 51.3	75 21.7	Visible 135° to the W. Exting- guished during the S.W. Monsoon from 20th May to the 10th of August.		
Tellicherry.	2 F. Vertical.	12	140 104	Fort Wall	11 44.8	75 28.5	Visible between S.E. by E. and N.W. by N. or 158° by the eastward. The high light during the S.W. Monsoon is lowered to 112 feet from 16th May to 14th September.		
Calicut.	1 F.	12	105	On a column near the Beach	11 15.2	75 45.6	Extinguished during S.W. Mon- soon from 20th May to 10th August. Seen between S.E. and N.N.W. by eastward.	0 15	5
Cochin.	1 F.	12	114	S. entrance	9 58.1	76 13.9	One mile east of the bar; visible from the W. 180°. Lowered to 62 feet during the S.W. Monsoon	1 0	3½
Ahpey.	1 Rev. ev. min.	15	100	Sandy Beach	9 30	76 20	With the lt. E. by N. you may anchor in 6 to 4½ fathoms. It is said to be visible 45 statute miles distant from the Ghant Mountains.		
Minicoy.	1	-	-	On the Island	8 17	73 3	<i>Proposed.</i>		

1.  
Name of  
Light.

COLOMBO.

POINT DE G

LITTLE B.  
ROCKS L

TRINCOMAL

"

Taticorin.

Paumben  
Palk Bay  
NegapatanKarikal,  
Carricoll  
Pondicheri

MADRAS.

Pulicat.

ARMEGON

Divy.

Masulipat  
GODEWA  
GODAVI

LIGHTS AND TIDES.—INDIAN OCEAN.

81

8. W. at & C. 9. Rise of Springs. M. Ft. 40 12 to 17 30 6 0 30 7 to 8 0 15 5 1 0 3½

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

CEYLON.

		Miles	Fect.		° N. ,	° E. ,		H.	M.	Ft.
COLOMBO.	1 F.	16	132	Clock Tower, S. E. 250 yds. from former position	6 55.9	79 48.7	Removed from the West Bastion to the Clock Tower.	1	0	2
POINT DE GALLE.	1 F.	12	100	On South Bastion	6 1.4	80 12.5	- - - - -	2	0	2
LITTLE BASSAS ROCKS Lt. V.	1 Fl. ev. 1½ min.	10	33	Inside the rocks, S. by W. ¼ W. ½ of a mile	6 23.5	81 43				
TRINCOMALIE.	1 Fl. ev. ¼ min.	17	104	Foul point	8 32.2	81 18.8	Within 7 miles the eclipses are not total.	8	18	2
"	1 F.	10	58	Round Island	8 31.5	81 12.7				

INDIA.—COROMANDEL COAST.

Tuticorin.	1 F.	12	43	Hare Island, on Obelisk, 2½ miles E. of Tuticorin	8 47.3	78 11.3	Visible from N. by E. to S. by E. or 202° open to the E.	1	15	2½
Paumben Pass, Palk Bay.	1 F.	12	97	A mile E. of Pass	9 17.5	79 12.6	Visible round the Compass.	1	30	2
Negapatam.	1 F.	12	100	On a Bastion	10 46	79 50	Lowered to 88 feet during N.E. Monsoon. Visible between N. N. W. and S. S. W. by the W. or 135°	5	0	3
Karikal, or Carricoll.	1 F.	8	65	- -	10 55.	79 49.6	Visible 146°			
Pondicherry.	1 F.	15	131	Stands in the square	11 55.7	79 49	Visible on all points of the sea horizon to the E.			
MADRAS.	1 F. & Fl. ev. 2 min.	17 to 24	132	Esplanade, N. of the Fort	13 5.2	80 16.5	Visible eastward or seaward 200°. Mariners should not bring this light to the southward of S. S. W. ½ W. to avoid the Pulicat Shoals.	7	34	3½
Pulicat.	1 F. Red.	6 or 7	56	Old flagstaff	13 25	80 19.3	When this light bears W. ¼ N. you are to the northward of all the shoals.	9	25	2½
ARMEGON SHOAL	1 F.	15	95	Village of Moona, or Moonapolium, a mile from the shore	13 52.8	80 12	Visible seaward or to the eastward 180°			
DIVY.	1 F.	12	90	2 miles N. W. of the point	15 58.9	81 9.5	Visible when bearing N. round by W. to S. W.	8	0	8
Masulipatam.	1 F. Red.	-	-	In the Fort	16 9.1	81 8.2				
GORDEWARE, or GODAVERY Pt.	1 F.	15	73	Hope Island, S. pt. of Coringa or Cocanada Bay	16 49.1	82 18.4	Visible when bearing S. round by W. to N. N. W.			

## LIGHTS AND TIDES.—INDIAN OCEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
Cocanada, Jag- ernautporam, or Conara.	1 F.	Miles	Feet.	N. side of entr.	N. 16° 56'	E. 82° 13' 8"	A guide for the anchorage.	9	10	4—5
SANTIPILLY.	1 F.	14	150	Conara Hill, $\frac{3}{4}$ mile inland	18 3·5	83 36·6	Visible seaward or to the E. 165°			
FALSE POINT.	1 F.	18	120	About 2 miles S.W. of the point	20 20	86 43 5				
Pilot Ridge Lt. V. (a Pilot Brig.)	1 F.	-	-	Moored in 21 $\frac{1}{2}$ fms. ; during the S.W. Mon- soon only	20 49·5	87 40	A <i>Blue</i> light ev. hour, and a <i>Maroon</i> at the intermediate $\frac{1}{2}$ hours during the S.W. Monsoon (15th March to 15th September.) A gun fired when a vessel is seen.			
HOOGLY RIVER, (Lower Lt. V.)	1 F.	-	-	Entrance to E. Channel in 7 $\frac{1}{2}$ fathoms	21 3·5	88 12	A <i>Blue</i> light ev. $\frac{1}{2}$ hour and a <i>Maroon</i> ev. $\frac{1}{2}$ hour (15th March to 15th Sept). From October to March, in the N.E. Monsoon, a <i>Maroon</i> or torch ev. $\frac{1}{2}$ hour, and a <i>Blue</i> light ev. hour. In the S.W. Monsoon the vessel is removed to Lat. 21° N.	10	0	10 $\frac{1}{2}$
HOOGLY RIVER, (Upper Lt. V.)	1 F.	-	-	Gaspar Chan., N. by W., 8 leagues from the lower Lt. V in 3 $\frac{1}{2}$ fathoms, S. 16° E. from Saugor light	21 26·2	88 5·3	<i>Blue</i> lights and <i>Maroons</i> through- out the night at intervals. Its position is slightly altered as the Channel shifts.			
Mutlah River (Light Vessel.)	1 F.	7	30	In 9 fathoms	21 6	88 48	<i>Temporary</i> . A <i>Red</i> flag at main- mast head ; and if in her position a rocket from 16th March to 16th October at 8 p.m., midnight, and at 4 a.m.	10	0	10
SAUGOR ISLAND.	1 F. & Fl. ev. 20 s.	15	82	Middleton point 200 yards from low water mark	21 38·7	88 2·2				12
COWCOLLY, or KAOKALI.	1 F.	15	62	2 miles S.W. of Kedgerce pt.	21 50·2	87 57·8	Partially lighted, and now used as an anchoring light. Visible from N. E. round E. to S.	11	30	

## BAY OF BENGAL (E. Coast) AND MALACCA STRAIT.

KOOTUBDEAH.	1 F.	18	120	W. part of Id.	21 52·5	91 50·2				
SAVAGE.	1 F.	13	106	Great Savage Island, entr. to Akyab Harb.	20 5·2	92 55·6			9	45
TERRIBLES.	1	-	-	On the S. Ter- rible	19 22·5	93 17	<i>Proposed</i> .			
ALGUADA.	1 Rev. ev min.	20	147	On the Reef	15 42	94 14			10	49

1. Name Ligh
RANGOON.
"
Amherst.
Double Is
Malacca S
(Light V
RACHADA.
RACHAD
MALACCA.
RAFFLES,
of Singa
SINGAPOR
HORSBUR
PEDRA I
Java & I
ANJER, S
Sunda.
Anjer Vi
Mensche
Manea
Middelbr
Edam.
Batavia.
North W
Crimon
Islands
Japar...
Samaran
Baly Str
Banjoew
Celebes

LIGHTS AND TIDES.—INDIAN ARCHIPELAGO.

83

3. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M. 10	Ft. 4-5	RANGOON.	1	Miles	Feet.	Elephant point	N. 16 29	E. 96 22.5	<i>Proposed.</i>	H. M.	Ft.
		"	1 F.	8	48	Lt. V. at entr.	- -	- -	A <i>Blue</i> light ev. hour from 7 p.m. to 4 a.m.	3 15	21
		Amherst.	1 F.	6	-	On the point	16 4.5	97 35	A small light. Uncertain if lighted		
		Double Isle.	1	-	-	N. pt. of Isle	15 53	97 36	<i>Intended.</i>		
		Malacca Strait (Light Vessel.)	1 F.	10 to 12	-	W. part of one Fathom Bank, in 4 fathoms, 100 yards N. of the Buoy	2 52.5	101 0	A <i>Maroon</i> at 10 p.m. and 2 a.m. A <i>Blue</i> lt. at 8 p.m., midnight, and 4 a.m. A <i>Red</i> flag with <i>White</i> anchor by day. Parcelar Hill E. $\frac{3}{4}$ S. clears N. part of bank, and E. $\frac{1}{4}$ S. clears S. part. A screw pile lighthouse is to re- place the Lt. V.	6 0	15
0	10	RACHADA, or RACHADO CAPE	1 F.	25	446	On the Cape	2 24.5	101 52.3	Visible when bearing from S.E. by E. round E. and N. to N.W. by W.	5 30	13
		MALACCA.	1 F.	12	146	St. Paul Hill	2 11.2	102 16.7	Leads clear of the Water Islands N. by W. $\frac{3}{4}$ W.	7 30	11
		RAFFLES, Strait of Singapore.	1 F.	12	105	Coney Islet	1 8.2	103 44.6	Visible from S.E. by E. round S. to W.S.W. or 233°		
		SINGAPORE.	1 F.	15	226	Flag Staff, Fort Canning	1 16.2	103 50.9	Visible from St. John's Island to Jahore Shoal, or 90°.	9 45	10

INDIAN ARCHIPELAGO.

		HORSBURGH, or PEDRA BRANCA	1 Rev. ev. min. (Brt. face 15 s.)	15	95	Summit of Rock	1 19	104 25			
		<b>Java &amp; its Ids.</b>					S.				
		ANJER, Strait of Sunda.	1 F.	20	150	Fourth pt., 2 miles S.W. by W. of the Port	6 4.5	105 53.1			
		Anjer Village.	2 F.	3 or 4	35 ea	On each Pier	6 3.2	105 55			
		Menscheneter, or Mancater	1	-	-	On the Island	5 57.3	106 30.8	<i>Building.</i>		
		Middelburg.	1	-	-	S. pt. of Island	5 58.8	106 41.2	<i>Building.</i>		
		Edam.	1	-	-	On the Island	5 57.5	106 50.2	<i>Building.</i>		
		Batavia.	1 F.	13	54	W. Pier	6 5.1	106 47.7	Light bearing from S. $\frac{3}{4}$ W. to S. $\frac{3}{4}$ E. leads to the anchorage.	10 0	2
		North Watcher.	1	-	-	On the Island	5 12.2	106 28.3	<i>Proposed.</i>		
		Crimon Java Islands.	1	-	-	Katang, or Western Island	5 47	110 6.7	<i>Proposed.</i>		
		Japar...	1	-	-	Jalie point	6 24	110 42.4	<i>Proposed.</i>		
45	9	Samarang.	1	-	-	-	6 57.7	110 24.2	<i>Proposed.</i>		
		Baly Strait.	1	-	-	Tabacan, or Duiven Island	8 1.4	114 25.2	<i>Proposed.</i>		
		Banjoewangie.	1	-	-	Utrecht Fort	8 12.3	114 20.2	<i>Proposed.</i>		
49	9	<b>Celebes.</b>	1 F.	-	-	Macassar	5 8.2	119 23.5	Harbour light, on Rotterdam Fort		

## LIGHTS AND TIDES.—INDIAN ARCHIPELAGO.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
		Miles	Feet.		° S.	° E.		H. M.	Ft.
<b>Banka Strait.</b>									
Tobu Ali.	1	-	-	In the Fort	3 1	106 28	<i>Proposed.</i>		
Pulo Dahan (Light Vessel.)	1	-	-	4½ miles S. of the Islet, centre of Stanton Channel	2 55	106 11	<i>Proposed.</i>		
KALIAN, OF KALEAN, W. end of Banka Island.	1 F.	20	170	On the point	2 46	105 85	Visible round the horizon.		
Mintok.	1 F.	-	-	Pier Head	2 55	105 11	<i>Preparing.</i>		
Frederic Hendric (Light Vessel.)	-	-	-	-	-	-	-		
<b>Philippines.</b>					N.				
Port Alfonso, Balabac Island E. coast	1 F.	10	268	On a hill, S. pt. of the Port, Calandorang Bay	8 1	117 4			
Zebu Port.	1 F.	4	49	Bagacay point, N. E. entrance	10 24.5	124 1.5		12 0	7
Romblon Island.	1 F.	-	-	Sabang pt., N. entrance	12 37.6	122 15.9			
CORREGIDOR ID.	1 Rev. ev. min.	20	639	Highest part	14 23.1	120 33			
Caballo Island.	1 F.	6	27	On the Islet	14 22.5	120 36			
BCHIAS ISLAND.	1 F.	-	-	Busin Port	13 9.7	123 3.9			
"	1 F.	-	-	Busin Port, S.W. entr.	-	-			
"	1 F. <i>Blue.</i>	-	-	Busainga Port	-	-			
"	1 F. <i>Blue.</i>	-	-	Malaguang-ilog	-	-			
"	1 F.	-	-	Engano Mouth	-	-			
MANILA BAY.	1 F.	10	51	N. shore of the River Pasig	14 36.2	120 56.5		10 40	2½
"	-	7	29	Sangley point, Cavite Bay	-	-	Harbour light.		

## COCHIN CHINA.

Pulo Condore.	1 R.	-	-	Little Condore	8 40.5	106 33.1	<i>Proposed.</i>	11 0	8
Cape St. James.	1 F.	28	482	776 yds. within the S. Ridge	10 19.2	107 5.4			
Saigon River Light Vessel.	1 F.	10	33	Inner Elbow of the river <i>en</i> <i>route</i> to Saigon	10 36.8	106 51.2			

## CHINA.

MACAO.	1 R.	20	330	Fort Guia	22 12	113 33.5			
Canton River.	2 F. <i>Red.</i>	-	-	Dutch Folly Fort	-	-		10 0	8
Swatow, or Shantau.	1 F.	-	-	Double Island	23 20	116 43.7	<i>Uncertain.</i>	3 0	9
Taetan Island.	1	-	-	-	24 24.5	118 9.3	<i>Building.</i> Position unknown.		
Pescadores	1 F.	1	225	Fisher Islet, S. V. extremity	23 33	119 24.5	Lighted occasionally.		

LIGHTS AND TIDES.—PACIFIC OCEAN.

85

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility: Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs. Ft.
							Lat.	Long.			
		<b>Yung River.</b>					N.	E.		H. M.	Ft.
		3. Yew Islet.	1 F. <i>Red.</i>	-	153	Western of the three islets, entr. of river	29 57.7	121 43.8	Visible round the horizon.		
		Tse-le, or Square Island.	1 F.	-	186	On the Island, 3½ miles N.E. of river's entr.	29 59.4	121 45.1			
		<b>Yang-Tse Kiang (Lt. V. in 22 feet.)</b>	1 F.	10	68	Mid. of Chan. N.N.W. ¼ W. from Gutzlaff Island	31 8	121 58.7	May be passed on either side. When a vessel is observed run- ning into danger a gun is fired, and the course indicated to be steered. Pilot Schooners cruise off Gutzlaff Island and Ariadne Rocks. In thick weather a flash light will be shown every hour.	12 0	15
		KiuT'oan Beacon	1 F.	5 or 6	70	In the Tower, S. side of entr.	- -	- -			
2 0	7	"	1 F. <i>Red.</i>	-	30	In the Tower, S. side of entr.	- -	- -		Will not be visible from a vessel's deck till in 18ft., L.W. springs.	
		Light Vessel, in 5 fathoms	1 F.	-	-	Langshan Cros- sing	- -	- -			1 40

JAPAN.

		Taske Harbour.	1 F.	-	-	N. side of entr.	33 23	129 31	Harbour light.		
		Seto-uchi, or Inland Sea.	1 F.	-	-	Fuku Uria, N. entrance	33 57.5	130 56			
0 40	2½	"	1 F.	-	-	Oka Mura, S. point	34 13	132 52.5	A wood fire burnt under an open shed. Too much confidence as to distance should not be placed on it, especially in wet weather when the fire is replenished with damp fuel, it becomes very dim, and is sometimes temporarily obscured.		
		"	1 F.	-	-	Mi-hara	34 24	133 7			
		"	1 F.	-	-	Akasi	34 39	135 0			
		"	1 F.	-	-	Awadsi-sima, N. point	34 37	135 1			
		Cape Idsu, or Iro-o-Saki.	1 F.	10 to 14	About 250	On the Cape	34 35	138 52			
1 0	8	YEDO GULF.	1 F.	12	75	Joka-sima, W. point	35 9	139 37			
		"	1 F.	-	-	Susaki, E. entr.	34 59.5	139 46	Uncertain.		
		East Coast.	2 F.	-	-	- -	37 20	141 14			

TARTARY GULF.

0 0	8	Castrics.	1 F.	18	250	Klostercamp, or Quoin point	51 26	140 52	Visible from N.E. ¼ E. round N. and S. to S.E. ¼ S.	10 30	6
3 0	9	SAGHALIN ID., near DUL.	1 F.	22	373	On slope of a steep hill	50 53	142 12		Position uncertain. Visible when bearing from N.E. ¼ E. round E. to S. by W. ¼ W.	

## LIGHTS AND TIDES.—PACIFIC OCEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## KAMCHATKA.

Avatchka Gulf.		Miles	Feet.		N. E.			H. M.	Fl.
					Lat.	Long.			
DAISI.	1 F.	24	449	E. side of entr.	52 52.8	158 47	Visible from E. by N. round southerly to N.W. $\frac{1}{2}$ W. Lighted occasionally.		
BABUSHKIN POINT.	1 F.	19	294	Second point, W. side of entr.	52 54.7	158 42.6			
RAKOF.	1 F.	22	378	Signal Station, about $\frac{1}{2}$ mile S. of entr. to Rakovya Harb	52 57.5	158 43.6			
AMUR.	1	7	40	W. part Con- stantine Bat- tery, opposite Nikolaevsk	53 7.2	140 41.8	Indicates the approach to the town of Nikolaevsk.		

## AUSTRALIA.

					S.				
					Lat.	Long.			
ROTTNEST ID.	1 Rev. ev. min.	20	197	Centre of Island 2 $\frac{1}{2}$ miles from E. end	32 0	115 31.2		7 50	2 $\frac{1}{2}$
SWAN RIVER.	1 F.	14	92	Arthur Head summit, S. entrance	32 3.2	115 45			
KING GEORGE SOUND.	1 F.	24	384	Breaksea Island, 1200 yards within its E. extremity	35 4.3	118 3.3	Does not fairly open till it bears N.E. $\frac{1}{2}$ N., and must not be steered for until it bears N.N.E. $\frac{1}{2}$ E.		
„	1 F.	10	37	Princess Royal Harbour, Pt. King, N. entr.	35 2.6	117 55.2	W. by N. $\frac{1}{2}$ N. 7 $\frac{1}{2}$ miles from the light on Breaksea Island	11 56	1—4
CAPE BORDA, or FLINDERS, N.W. point of Kangaroo Id.	1 Rev. ev. $\frac{1}{2}$ min.	Brt. 30 Red. 15	510	On the Cape; 1500 ft. inland	35 45.3	136 38	Red & White alternately. Visible from S.W. by S. to N.E. by E. $\frac{1}{2}$ E. by the W. When the Red light is not visible the White light will appear at intervals of one minute.		
ST. VINCENT GULF.	1 Int. vis. 24 s. ev. min.	16	80	Troubridge Shoals, centre of Island	35 7.8	137 52	Vessels should make the light bearing N.E. $\frac{1}{2}$ N. and steer N.E. by E. $\frac{1}{2}$ E., passing about 7 miles distant. There is anchorage N.E. of light in 8 fathoms, 1 $\frac{1}{2}$ miles distant.	3 30	6
„	2 F.	10	38 29	Lt. V. entr. of Port Adelaide, 1 mile S.W. of the Bar in 5 fathoms	34 47	138 30	A light is <i>proposed</i> to be erected on piles to supersede the Lt. V.	5 30	6
„	1 F. Red.	3	—	Lefevre's Penin, Pilot Station, end of Jetty	34 50	138 31			
„	1 F. Green.	6	29	Glencel Jetty, outer part	34 59.5	138 33	Anchor in 5 fathoms, light bearing E. by N.		
STURT, Kangaroo Island, S.E. point.	1 Rev. ev. 1 $\frac{1}{2}$ min	24	248	Willoughby Cape, Back- stairs Passage	35 51.5	138 10.8	Visible on all bearings from N. by W. $\frac{1}{2}$ W. round by east, to S.W. by W. $\frac{1}{2}$ W.	4 10	6





## LIGHTS AND TIDES.—PACIFIC OCEAN.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
PORT PHILIP. (Light Vessel.)	2 F. 24ft. apart	Miles 8	Feet. 50 each	N. end of W. Chan., in 3 fathoms	S. °	E. °	A Gong. When adrift two <i>Red</i> lights are exhibited.	H.	M.	Ft.
„	1 F.	7	27	Geelong, or Corio Harb., near the Bird Rocks, star- board side, Lt. V. in 2 fathoms	-	-	A Gong. When adrift two <i>Red</i> lts. are substituted. Tidal sig- nals, showing the height of water on the bar, are exhibited from the Lt. V.	2	30	3½
„	1 F.	3	-	End of Steam Boat Jetty	-	-				
„	1 F.	3	-	Pier Head ex- tremity	-	-				
„	1 Rev.; a flash ev. ¼ min.	10	about 40	Melbourne Lt. V., off Gelli- brand point, in 5 fathoms	37 52.7	144 54.9	A Gong.			
„	2 F. <i>Red</i> , <i>Green</i> .	2 each	-	Sandridge, on end of old pier & railway pier	-	-		2	31	2½
„	1 F. <i>Red</i> .	2	-	Extreme of old Jetty	-	-	Uncertain.			
„	1 F. <i>Red</i> .	4	-	Schnapper pt., e. d of Jetty	38 12.9	145 2		2	14	2¾
CAPE SCHANCK.	1 F. & Fl. ev. 2 min.	23	328	Highest part, S. extremity	38 30	144 54	Visible from W. ¼ N. to S.E. ¼ E. A reef lies S.S.E. ¾ mile from lighthouse			
WILSON PRO- MONTORY.	1 F.	24	342	S. E. part	39 9	146 23	Visible between S.S.W. & E.N.E. except when hidden by the adjacent islands. When the light bears N.E. vessels may steer direct for the promontory, between Cleft and Rodondo Ids.	2	0	10
PORT ALBERT, Corner Inlet.	1 F. & Fl. ev. 3 min. <i>Red</i> .	9	40	E. part LaTrobe Island	38 46	146 31	Visible between W. by S. & N.E.	11	40	8
DEAL ISLAND.	1 Rev. ev. min., and 40 s.	36	950	On summit, S.W. side	39 29	147 21.6	Frequently obscured by fogs; at 10 miles distance it is 50° bright and 50° dark.			
GABO ISLAND.	1 F.	22	172	5½ miles S.W. ¾ S. of Cape Howe. 600 yds. from S.E. part of Island	37 35	149 55.1	Visible from E. ¼ N. round by N. to S.S.W.	11	10	
Twofold Bay, Eden Harbour	1 F. <i>Red</i> .	9	140	Lookout point, S. extremity	37 4.5	149 55.6	Visible 85° seaward. When round- ing the lighthouse give it a berth of a ¼ mile.			
JERVIS BAY.	1 Alt. ev. ¼ min.	H. 18 R & C 14	224	About 2 miles to the N. of Cape St. George	35 9.2	150 47.8	Alternating <i>White</i> , <i>Red</i> & <i>Green</i> . From the northward it opens of Crotchet Head S.S.W. ¼ W., and when about 8 miles distant, on approaching it from south- ward, it must not be brought to bear to the northward of N. by W.	6	20	6—9

LIGHTS AND TIDES.—PACIFIC OCEAN.

89

8.		9.		1.	2.	3.	4.	5.	6.		7.	8.		9.
H. W. at F. & C.	Rise of Springs.	Name of Light.	No. of Lights, Character, &c.						Visibility.	Height of Light above the Sea.		Where placed.	Position.	
H.	M.	Ft.		Miles	Feet.		° S.	° E.				H.	M.	Ft.
				PORF JACKSON.	1 Rev. ev. min. and 30 s.	21	344	S. Head, Mac- quarie Tower	33 51.2	151 18.2	Visible from N. by W. to S. by W. ¼ W.	8	17	
				"	1 F.	04	90	Inner S. Head, or Hornby Lt.; edge of cliff	33 50.7	151 18.7	Visible from N. W. by N. to S. W. ¼ W.			
2	30	3½		"	2 F.	6	26	Lt. V., on the N. W. edge of Sow and Pigs Shoal in 21 ft.	33 50.1	151 19	A Red flag by day.			
				"	1 F. Red.	-	20	On the Tower, Fort Denison	- -	- -		8	34	4½
				NEWCASTLE.	1 F.	17	115	Nobby Head	32 55.3	151 48.8	Visible from N. by E. ¼ E. to S. W. by W.	9	45	6-7
				MORETON BAY.	1 Rev. ev. min.	26	382	Moreton Island, N. E. point	27 2.3	153 28.6				
				"	1 F.	7	35	S. S. W. ¾ W., nearly ¾ mile from N. pt. of Island	27 2.2	153 27.5	Visible from S. ¼ W. to E. by N. ¼ N. by eastward. In one with the revolving light on a W. ¼ S. bearing.			
2	31	2¾		"	1 F.	-	18	Comboyuro pt.	27 4.2	153 22	Red seaward from the bearing of S. by W. ¼ W., and White from S. by E. ¾ E. to E. N. E. by the westward. Obscured between S. by W. ¼ W. and S. by E. ¾ E.	9	30	3-7
2	14	2¾		"	1 F.	-	18	Cowan Cowan point	27 8.3	153 22.6	Obscured between E. ¾ N. and N. E. ¼ N.; also between N. N. E. ¼ E. and N. by E. ¼ E.			
2	0	10		"	1 F.	-	-	Brisbane Lt. V.	27 20.7	153 11.2	At the entrance to river. N. by E. 580 yards from Lt. V. in 3½ ft. is a Beacon Red light. West Beacon 1067 yards to the south is a F. light.			
				PORF STEPHENS.	1 Rev. ev. min	17	126	S. side of entr.	32 44.6	152 13	A White and Red flash ev. min. The lighthouse should not be approached within one mile.	9	0	6

TASMANIA.

				GOOSE ISLAND.	1 F.	20	135	Near the S. pt. Chappel Ids.	40 18.7	147 48				
				SWAN ISLAND.	1 Rev. ev. min.	14	110	N. point	40 43.5	148 8.5				
				DALRYMPLE PORF.	1 Rev. ev. min. and 40 s.	15	142	Low Head, E. entr. Tamar River	41 3.4	146 48.2	At 10 miles it appears for 50 s. bright and 50 s. dark.	12	5	10
6	20	6-9		D'ENTRECA- TEAUX CHAN.	1 Rev. ev. min. and 40 s.	22	335	Cape Bruny, S. W. point	43 29.5	147 10	At 10 miles it appears for 50 s. bright and 50 s. dark.			
				HOBARTON.	1 F.	10	65	Iron Pot Isle, Mouth of Der- went River	43 3.7	147 26				
				"	1 F. Red.	-	-	Sullivan Cove, Pier Head	- -	- -	For Steamers.	8	45	4½

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			

## NEW CALEDONIA.

Port of France.	1 F.	Miles	Feet.	Amedee Island.	S. / E. /		Building.	H. M.	Ft.
					22 28 6	106 29 3			
		-	-					8 25	4

## NEW ZEALAND.

## Hauraki Gulf.

Tiri Tiri Ma- tangi Island.	1 F.	23	300	On the Island	36 36.5	174 53.2			
Auckland.	1 F. <i>Red.</i>	-	-	Pier Head	36 50	174 49	- - - - -	7 5	11
<hr/>									
<b>Cook Strait.</b>									
Mana Island.	1 F.	29	450	N.W. part of Island, off the entrance to Porirua Harb.	41 5	174 48			
Port Nicholson.	1 F.	30	420	Pencarrow Head, Wellington	41 22	174 51.2	- - - - -	4 30	5
<hr/>									
<b>NELSON.</b>									
	1 F.	12	60	Boulder Bank, S.W. part	41 15.1	173 17.1	Visible from E. by N. round N. to S. by W. $\frac{3}{4}$ W. Outer anchor- age in 6 fathoms, with light at E.S.E., but do not shut in the light nor approach the point on which it stands nearer than a mile.	9 50	14
	1 F. <i>Red.</i>	-	-	Entrance of Harbour	41 16	173 17.5			
<hr/>									
<b>PORT LITTLETON.</b>									
	1 F.	29	450	Cachalot Head, N. side of entr.	43 35.5	172 49.5	Visible through an arc of 200°, but when bearing from seaward, only from W. $\frac{1}{4}$ N. round W. and S. to S.S.E. $\frac{1}{4}$ E.	3 50	7 $\frac{1}{2}$
<hr/>									
<b>OTAGO HARB.</b>									
	1 F. <i>Red.</i>	20	196	Tairoa Head, E. side of entr.	45 47	170 45	Visible seaward when bearing from W. $\frac{3}{4}$ S. round by south to S.E.	2 50	7
<hr/>									
<b>Foveaux Strait, Dog Island.</b>									
	1 Rev. cv. $\frac{1}{4}$ min.	18	150	On the Island, S.E. of Bluff Harbour	46 39.6	168 26			

8. L. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			

SOCIETY ISLANDS.

1. M.	M.	Ft.	1 F.	Miles	Feet.	Where placed.	S.		W.		H. M.	Ft.
							°	'	°	'		
8	25	4		6	-	Point Venus	17	29.7	149	29.1		

HAWAII GROUP, OR SANDWICH ISLANDS.

1.	M.	Ft.	1 F.	Miles	Feet.	Where placed.	N.		W.		REMARKS.
							°	'	°	'	
				-	-	-	19	28	155	55	<i>Building:</i> On the point where Captain Cook, R.N., was killed.
				-	-	-	21	45	160	12	

7 5 11

4 30 5

9 50 14

3 50 74

2 50 7

# BRITISH NORTH AMERICA.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
		Miles	Fect.		° N.	° W.		H.	M.	Ft.
<b>Labrador.</b>										
BELLE ISLE, Strait of Belle Isle.	1 F.	28	470	Extreme S. pt. of Island	51 53	55 22.2	A gun is fired every hour during a fog or snow storm.			
AMOUR POINT.	1 F.	18	155	S.E. side of Forteau Bay	51 27.6	56 50.9	Signals:— Fog whistle or gun.			
<b>Newfoundland</b>										
OFFER WADUAM	1 F.	15	96	On the Island	49 35.7	53 45.1				
BONAVISTA.	1 Rev. ev. 90 s. Red & White	18	150	On the Cape	48 41.9	53 5.3	Kept open of Spillers Point, clears the Flowers Rocks.			
Catalina Harb.	1 F.	15	92	On Green Island	48 30.2	53 2.7	Visible from W.S.W. seaward to N.E.	7	0	6
BACCALIEU ID.	1 Fl. ev. 10 s.	28	443	½ mile from N. part	48 8.8	52 47.8	When the S. Part of the Island bears N.N.E. ¼ E. within the distance of eight miles, the light is obscured by the high land. Keeper's dwelling <i>White</i> , and roof <i>Red</i> .			
HARBOUR GRACE	1 F.	18	151	N. end of Island	47 42.7	53 8.2	Visible from N.N.E. to S.S.W.			
"	2 F. Vertical.	11	40 17	On pt. of Beach, N. side	47 41.4	53 12.5	Lighted by Gas. West leads in to clear the spit of 8 feet. Appears as a double light for 3 miles. Obscured by the Salvage on W. ¼ S. bearing			
St. JOHN'S HARBOUR.	1 F.	16	114	Fort Amherst, S. side of entr.	47 33.9	52 40.3	Visible seaward from W.S.W. to N.N.E. When C. Spear, or St. John's Harbour is enveloped in fog, a gun is fired every hour during day.	7	30	6
"	1 F. Red.	-	225	Near a chapel, in front of Cathedral	47 34	52 42.1	Lights in one lead through the Narrows.			
"	1 F. Red.	-	50	On top of Custom-house	47 34	52 41.8				
CAPE SPEAR.	1 Rev. ev. min.	22	264	On the Cape	47 31.2	52 37	Seen round the seaward horizon.			
FERRYLAND.	-	-	-	On the Cape	47 1.0	52 51.1	<i>Proposed.</i>			
CAPE RACE.	1 F.	19	180	On the Cape	46 39.4	53 4.3	A conical beacon stands 50 yards S. from the lighthouse, and the Telegraph Station N. 240 yards. Seen seaward E.N.E. to W.S.W.	7	0	6½
CAPE PINE.	1 R.	24	314	On the Cape	46 37.1	53 31.7	Seen from W. by S. to S.E.			
CAPE St. MARY.	1 Rev. ev. min. Red and White.	26	390	On the Cape	46 49.5	54 11.6		8	30	7
BURIN ISLAND.	1 Rev. ev. 20 s.	27	430	On Dodding Head	47 0.4	55 8.7				

1.	2.	3.	4.	5.	6.		7.	8.	9.
					Position.				
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
		Miles	Feet.		N.	W.		H. M.	Pt.
ST. PIERRE ID.	1 Fl. ev. 20 s.	20	210	Galantry Head	46 46	56 9.1	Red Fl. succeeded by two <i>White</i> ones. During a fog 2 guns are fired at intervals of 3 minutes ev. 2 hours from 6 a.m. to 6 p.m. Obscured on the north by the bluffs of St. Pierre.	8 33	6½
„	1 F.	6	36	Canon point, St. Pierre Harb.	46 47	56 9.6	Lights in one N.W. lead in mid Channel through the S. entrance. <i>Red</i> light kept open of Cape Eagle clears the shoals off Red Cape.		
„	1 F. <i>Red.</i>	3	64	N.W. of above	- -	- -			
FORTUNE BAY, Brunet Island.	1 Fl. ev. 10 s.	25	408	Mercer Head	47 15.5	55 51.8	Visible in all directions, except when obscured by the land, when bearing from E.S.E. to South.		
<b>Gulf &amp; River</b> ST. PAUL ISLAND	1 F.	20	140	On a Rock, 26 feet from the Island	47 13.8	60 8.3	Obscured from N. by E. & E. to E.N.E.	8 0	5
„	1 Rev. ev min.	20	140	On the S.W. point	47 11.3	60 9.6	Bell sounded during a fog, and a gun fired ev. 4 hours. Visible on all bearings except between S.S.E. and West.		
MAGDALEN ID.	1	-	-	Bird Rocks	47 50.9	61 9.2	<i>Proposed.</i>		
CAPE ROZIER.	1 F.	16	136	On the Cape	48 51.6	64 12	A gun is fired every hour during fog and snow storms.		
ANTICOSTI ID.	1 F.	15	110	Heath point	49 5.3	61 41.8	Shown from April to 1st Dec. Lighthouse must always be kept open southward of Cormorant point. Visible from N.N.W. to N.E. by N. Dépôt of provisions here for shipwrecked Mariners.	1 0	5
„	1 Rev. ev. min.	15	100	S.W. point	49 23.7	63 35.8	Visible from N.N.W. round southward to S.E. by E.		
„	1 F.	15	112	Extreme W. pt.	49 52.5	64 32	A gun is fired ev. hour during fog and snow storms. Dépôt of provisions for shipwrecked Mariners	2 0	6
POINT DE MONTS	1 F.	15	100	About 1½ miles N E. of the pt.	49 19.6	67 21.9	Dépôt of provisions.		
Father Point, Rimousky.	1 F.	10	43	On the point	48 31.4	68 27.3	Visible from W. by S. & S. round southward to E. & N. From 10th April to 10th December.		
BICQUETTE ID.	1 Rev. ev. 2 min.	17	112	Centre, nearly	48 25.3	68 53.3	A gun fired ev. half hour during fog and snow storms. From 10th April to 10th December.		
RED ISLET.	1 F. <i>Red.</i>	12	75	Centre	48 4.3	69 32.9			
GREEN ISLAND.	1 F.	13	60	On the N. point	48 3.3	69 25	From 10th April to 10th Dec. A gun fired every ½ hour during fog and snow storms.	2 45	16
Brandy Pots.	1 F.	10	78	42 fms. from S.E. end of Islet	47 52.5	69 40.6	From 10th April to 10th Dec.	3 0	17

W. & C. Rise of Springs. 9. M. Ft. 0 6 30 6 0 6½ 30 7

## LIGHTS AND TIDES.--BRITISH NORTH AMERICA.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
LONG PILGRIMS.	1 F.	Miles 12	Feet. 180	120 feet W. of the centre of Island, and 320 feet S. from water's edge	47 43.2	69 45	From 10th April to 10th Dec.	H. M.	Ft.
GASPE BASIN.	1 F. <i>Red.</i>	-	20	O'Hara point, Wharf	48 49.9	64 31.7	Only when mail steamers are expected.	2 40	5
S. Traverse (Light Vessel.)	2 F.	9	36 32	N. E. part of St. Roque Shoals	47 22.2	70 14.9			
STONE PILLAR.	1 Rev. ev. 1½ min	13	68	300 feet from S. pt. of Islet	47 12.4	70 21.6	From 10th April to 10th Dec.	5 0	17
GRAND ISLE, KAMOURASKA.	1 F.	-	166	720 feet from N. E. end of Island	-	-			
CRANE ISLAND.	1 F.	-	44	480 feet from W. pt. of Id.	-	-		5 24	17
BELLE CHASSE.	1 F.	-	70	East end of Id.	-	-			
St. Antoine.	1 F.	10	96	S. shore	46 39.7	71 36.2			
St. Croix.	1 F.	6	30	On S. shore, near H. W. mark	46 37.7	71 44.2	A small light, to assist in keeping in the Chan. for some distance, up and down the river.		
Port Neuf.	2 F.	5	200 120	On N. Shore, ¾ of a mile off the river	46 41.8	71 52.2	S. W., & v. v., nearly 180 yards apart. Lights in one lead up the Richelieu Channel to the light on Richelieu Island.	8 30	14
PLATON POINT.	2 F.	12	152 130	On S. side, 1½ miles below Richelieu Id.	46 39.2	71 53	S. 72° W. 160 yds. apart. These lights lead up the Richelieu.		
Richelieu.	1 F.	6	27	On centre of Id.	46 38.4	71 54.8	This light and the lights on Platon point are very nearly in the same line of bearing, viz. N. 73° E.		
Langlais Point.	1 F.	5	35	On S. shore, ½ mile below Great Chene River	46 35.1	71 59.6	To show off Batten des Grondines and to avoid Battens Cordin, and as a steering point for Richelieu.		
Cape Charles.	2 F.	4	110	On the Cape	46 33.6	72 4.2	N. 67° W., 80 yds. apart. Lead to and from Cape a la Roche and Cape Charles, and to answer as a steering pt. through Richelieu.		
Grondine.	2 F.	5 each	50 25	On N. shore	46 35.8	72 4.2	To lead off Cape a la Roche to Levrard. S. 66° W., 1350 yds. apart.	9 0	9
St. Pierre des Bequets.	1 F.	5	53	On S. shore, summit of St. Pierre point	46 30.5	72 12.5	To indicate the widest berth off Cape a la Roche.		
Batiscan.	2 F.	3	39 20	N. shore, 1¼ miles below Batiscan Ch.	46 30.3	72 14.9	S. 73° W., 222 yds. apart. Leads through Levrard, and clears the Bature St. Ann on the south, and Pouillon on the north.		
Champlain.	1 F.	4	30	N. shore, near Champlain Ch.	46 26.6	72 20.5			
Bigot Island.	-	-	-	-	-	-	<i>Proposed.</i>		
Cape Madeleine (Lower Is.)	2 F.	4	53 33	N. shore, 3 miles below the Cape	46 23.8	72 27.3	S. 60° W., 200 yards apart. To clear Provenché Shoal.		

1. Name Light
Cape Madeleine (Upper Is.) Port St. Francois
Point du Fort
St. Peter Lake. East Lt. V.
Centre Lt.
Western Lt.
Raisin.
"
Stone. Valtrie.
Traverse.
Plum Island Repentigny
Bagne.
St. Therese
Point aux Isles. Montreal.
New Brunswick. Miscou Island MIRAMIC Shediac. Richibucto



LIGHTS AND TIDES.—BRITISH NORTH AMERICA.

3. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Fect.		N.	W.		H. M.	Ft.
		Cape Madeleine (Upper lts.)	2 F.	6	55 35	N. shore, 2 miles below the Cape	46 23.3	72 28.6	S. 85° W., 235 yards apart. To clear Bature Bigot.		
		Port St. Francis	2 F.	3 each	31 12	S. shore	46 16.3	72 37.2	S. 76° W., 3240 yds. apart. These are very small lights, only 4 ft. square. Removed at the fall and replaced in spring.		
40	5	Point du Lac.	1 F.	12	71	N. shore	46 16.8	72 40.4	This light in one with the Eastern Lt. V. on lake leads up through the dredged channel S. 70° W.		
0	17	<b>St. Peter's Lake.</b>									
		East Lt. V.	1 F.	6	15	In Lake	46 15.9	72 42.3	Shows the turn of the channel at Point du Lac.		
24	17	Centre Lt. V.	1 F.	6	15	S.S.E., 2½ miles from Riviere du Loup	46 11.6	72 53.3			
		Western Lt. V.	1 F.	6	15	N. side of Chan., N.E. by N., 3 miles from Flat Island	46 9.6	72 56.8			
39	14	Raisin.	1 F.	6	30	On the Island	46 6.2	72 57.8			
		"	1 F.	-	-	S. part of Island	-	-			
		Stone.	1 F.	6	30	E. part of Island	46 5.9	72 59.7	Indicates entrance to channel.		
		Valtrie.	2 F.	7	21 13	E. side of Id.	45 52.9	73 16	S. 38° W., 320 yds. apart. Leads to the Chan. called Flat Islands.		
		Traverse.	2 F.	-	-	2½ miles above Contrecoeur	45 49.9	73 17	S. 28° W., 1500 yards apart. Leads into La Valtrie Channel and Isle Bouchard, and indicates the New Channel; to be kept in line till La Valtrie lights are brought to bear.		
		Plum Island.	-	-	-	-	-	-	<i>Proposed.</i>		
		Repentigny.	2 F.	4	30 14	¾ mile below Repentigny	45 45.1	73 26.1	S. 22° W., 170 yards apart. Leads through Channel, avoid- ing Pouillin on north, and shoal on south.		
		Bague.	1 F.	4	24	On the Islet	45 44.2	73 26.2	To indicate the Island, being extremely low land.		
0	9	St. Therese.	2 F.	4	-	On the Island	45 41.4	73 27.7	S. 50° W., 220 yards apart. Leads to entr. through Vercheres Channel, up and down the river.		
		Point aux Trem- bles.	2 F.	-	-	W. shore	45 38.4	73 29.3	S. 46° W., 600 yards apart. To lead up to Longue point.		
		Montreal.	2 F. <i>Red.</i>	4	38 29	On the Wharf	45 30.4	73 33.2	Shows the deepest Channel to and from the Harbour.		
		<b>New Bruns- wick.</b>									
		Miscou Island.	1 F. <i>Red.</i>	12	79	Birch point	48 1	64 29.4	- - - -	2 30	5
		MURAMICHU BAY.	1 F.	14	70	Eseumenac pt.	47 4.5	64 47.5	- - - -	5 20	5
		Shediac.	1 F.	6	15	Chene Wharf	46 14.6	64 31.5	Summer season.		
		Richibucto.	1 F.	14	70	On the head	45 39.7	64 42.5	- - - -	3 30	4

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility. Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs. Ft.
					Lat.	Long.		H.	M.	
<b>Prince Edward Island.</b>					<sup>o</sup> N.	<sup>o</sup> W.		H.	M.	Ft.
BEDEQUE BAY.	1 F.	7	15	Green's Wharf	46 23.5	63 47.1	While navigation is open.	10	15	7
"	1 F.	14	80	Salutation, or Sencow Head	46 19	63 48.5				
Charlotte Town Harbour	1 F.	9	35	Blockhouse pt., W. side of entr.	46 11.6	63 7.5		10	45	9½
HILLSBOROUGH BAY.	1 F.	13	68	Prim pt., 100 yds. from S. E. pt. of Bay	46 3.2	63 2.1				
CARDIGAN BAY, George Town Harbour, S. entrance.	1 F.	14	89	Pannure Head	46 8.8	62 27.7	Light should be kept open of Terras point, to clear the reef off Cape Bear.	8	40	5
Richmond Harb.	1 F.	8	20	Bill Hook, or Fishery Id., N. side entr.	46 34.7	63 42.5		6	0	3
Casculapeque, N. side.	1 F.	8	82	Sandy Island	46 48.4	64 2.2		5	40	3
<b>Nova Scotia.</b>										
PICTOU HARBOUR	2 F. Vertical.	11	65	S. pt. of entr.	45 41.4	62 39.4	A small <i>Red</i> light is seen below the lantern, kept W.S.W., clears the E. reefs of Pictou Island.	10	0	6
PICTOU ISLAND.	1 F.	12	52	S.E. point	45 49.2	62 30.5				
CAPE ST. GEORGE	1 Rev. ev. ¼ min.	25	350	On the N. side Cape	45 52.6	61 53.7				
<b>Breton Island.</b>										
Port Hood.	1 F.	10	54	S. entr. of the Harbour	46 0	61 31.7	<i>Red</i> on N. side, <i>White</i> on S. side	9	0	4½
SEA WOLF, OR MARGARET ID.	1 F.	21	298	Summit or mid- dle of Island	46 21.5	61 15.5	To Vessels in dangerous proximity to the Island the light may become obscured by the abrupt cliffs on the sides of the Island.			
BIRD ISLAND.	1 Rev. ev. min. <i>Red &amp; White</i>	14	77	Ciboux Island, ¼ mile from N. end	46 23.2	60 22.5				
SYDNEY.	1 F.	14	70	Ft pt., E. side of Spanish Bay	46 16.2	60 7.4		8	15	5
FLINT ISLAND.	1 Rev. ev. 15 s.	12	65	On the Island	46 11.1	59 45.8	Visible round the compass.			
SCATARI ISLAND.	1 Rev. ev. min., dark ½ min.	15	90	N. E. point, on Trap Rock	46 2.2	59 40.3	The light should never be brought to bear to the eastward of N. N. E., or to the southward of S. S. W., nor approached nearer than 1½ miles. A signal gun.			
LOUISBURG HARBOUR.	1 F.	16	85	N. side of entr., 60 fathoms in shore, on light- house point	45 54.6	59 57.3		8	0	5
<b>Nova Scotia.</b>										
CANSO GUT.	1 F.	18	116	N. entr., W. side, 120 yds. in shore	45 41.7	61 29	There is good anchorage under the light, with the wind off shore.	9	15	4
"	2 F. Horizontal	8	25 each	S. entr., Eddy point	45 31.5	61 14.7	8 yards apart.			

Nat  
LigGuysbo  
Ched  
Bay.

GREEN

ARICIA

Mada

CANSO

WHITE

BEAVER

Egg Isl

HALIFA

"

SAMBRO.

LUNENB

CAPE LE

Metway

LIVERP

Little H

Rugged

Harbo

SUELBO

HARI

PORT L

CAPE S.

Tusket

Public

LIGHTS AND TIDES.—BRITISH NORTH AMERICA.

8.		9.	1.	2.	3.	4.	5.	6.		7.	8.	9.
H. W. at F. & C.	Rise of Springs.	Name of Light.						No. of Lights, Character, &c.	Visibility.			
H. M.	Ft.				Miles	Feet.		Lat.	Long.		H. M.	Ft.
			Ghysboro' Harb., Chedabucto Bay.	1 F.	8	30	W. side of entr. near Peart pt.	45 22.8	61 29.2		8 20	6½
10 15	7		GREEN ISLAND.	1 F.	14	70		45 28.8	60 53.7			
			ARICHAU HARB., Madame Id.	1 F.	8	34	Marache point, S. entrance	45 29	61 1.9			
10 45	9½		CANSO CAPE.	2 F. Vertical.	15 9	75 40	N. part of Cranberry Island	45 19.8	60 55.5	In one tower		
			WHITE HEAD ID.	1 Rev. ev. 20 s	11	55	S.W. extremity	45 12	61 8	Flash and partial eclipse each 10 s.		
8 40	5		BEAVER ISLANDS.	1 Rev. ev. 2 min.	12	70	S. E. part of E. Beaver, or William Id.	44 49.6	62 20.2			
			Egg Island.	1 Rev. ev. min. Red & White.	15	85	On Island	44 39.8	62 51.5			
6 0	3		HALIFAX.	1 F.	8	45	Devil Island, S.W. part, E. entr. to Harb.	44 34.8	63 27.4	Bright Red to seaward.		
5 40	3		"	1 F.	12	58	Sherbrooke Tower, Manger Beach, E. side of entrance	44 36.1	63 31.9	When Sambro light bears W.S.W. this light should not be brought to the westward of N., which clears the Thrum Cap Shoal.	7 49	6
10 0	6		SAMBRO.	1 F.	20	115	Middle of Id.	44 26.2	63 33.7	If a vessel fires a gun during a fog it will be answered by two from island.		
			LUNENBURG BAY	2 Vertical. Upper, Rev. ev. min., Lower F.	14 8	100 65	Cross Island, E. point	44 18.7	64 9.9	Upper White 45s., dark 15s. Here vessels might take refuge in case of necessity.		
			"	1 F.	-	-	Battery point	44 21.7	64 17.6	On top of white dwelling house.		
9 0	4½		CAPE LE HEVE.	1 Rev. ev. 30 s.	13	72	Ironbound Id., S. side	44 13.7	64 16.3	Near the edge of a cliff 40 ft. high.		
			Metway Head.	1 F.	10	44	Admiralty Head, W. side entr.	44 6.2	64 32.2	Looks like a dwelling house.	7 50	8
			LIVERPOOL BAY.	1 Rev. ev. 2 min.	16	72	Coffin Island, S. point	44 2	64 37.6	Bright 40s., dark 80s.	7 50	8
			"	1 F.	7	30	Fort point	44 3.7	64 39			
			Little Hope.	1 Rev. ev. min. Red.	11	40	On Island	43 48.5	64 47.2			
8 15	5		Rugged Island Harbour.	1 F.	10	44	Gull Rock	43 39.2	65 5.1		7 59	7½
			SHELBOURNE HARBOUR.	2 F. Vertical.	18 10	120 65	Cape Roseway, near S. extr., Macmurt Id.	43 37.3	65 15.7	18 yards apart.	8 4	7
			PORT LATOUR.	1 Rev. ev. 40 s.	12	49	Baccaro point, W. side entr.	43 26.9	65 28.2	Bright 15s., dark 25s.		
			CAPE SABLE.	1 F. Red.	12	53	On the Ca.	43 23.3	65 37.2			
8 0	5		Tasket River.	2 F. Horizontal	-	-	Big Fish Island	43 42.5	65 56.8			
9 15	4		Pubnico Harbour	1 F.	8	28	On Beach point, S.E. side of entrance	43 35.7	65 46.9	Open westward of St. John's Id., bearing N.E. by N., clears the ledge; making the harbour from any other direction the light must be brought to the northward of E.N.E. before it can be steered for, to avoid St. Ann Shoal.	9 25	12

## LIGHTS AND TIDES.—BRITISH NORTH AMERICA.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibilty.	4. Height of Light above the Sea	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
<b>Bay of Fundy.</b>		Miles	Feet.		° N.	° W.		H.	M.	Ft.
SEAL ISLAND.	1 F.	18	98	S. point, $\frac{1}{4}$ of a mile inland	43 23.6	66 0.9				
YARMOUTH, or CAPE FOURCHÉ	1 Rev. ev. 1 $\frac{1}{2}$ min.	20	117	E. Cape, S. pt.	43 47.5	66 9.3	Bright 1 $\frac{1}{2}$ min., dark $\frac{1}{2}$ min. Fog-bell.	10	9	16
BRVER ISLAND.	1 F.	15	92	W. point	44 14.9	66 23.5				
Peter Island.	2 F. Horizontal	10	40	S. entrance to Grand Passage	44 15.5	66 20.9	Seen from N. between S. by W. and S.S.W.; from the S. between N.E. by E. and N.N.W. $\frac{1}{4}$ W.			
Petite Passage, N. entrance	1 Fl. ev. min. <i>Red &amp; White.</i>	-	-	Boar's Head	44 24.3	66 13		10	41	22
DIGBY, or AN- NAPOLIS.	1 F.	13	76	S. pt. of entr.	44 41.6	65 47.1				
Marshall Cove, or Port Wil- liams.	2 F.	5	60 57	- -	44 56.9	65 16	At the distance of about 5 miles it will show a <i>White</i> light, and on a nearer approach <i>green</i> .			
Margaretville.	2 F.	5	30 27	- -	45 2.9	65 4	At the distance of about 5 miles it will show a <i>White</i> light, and on a nearer approach <i>Red</i> .			
BLACK ROCK Pt. HORTON.	1 F.	12	45	S. shore	45 10.2	64 46		11	29	36
BASIN OF MINES	1 F.	20	92	On the Bluff	45 6.2	64 2		12	30	48
Partridge Island, or Parborough	1 F.	13	75	Burncoat Head	45 18.3	63 46.9				
Apple River.	1 F.	9	37	W. side of river	45 23	64 19				
	2 F. Horizontal	10	40 16	Cape Capstan or Hetty pt., N. entrance	45 26	64 50	8 yards apart.			
Cobequid Bay.	1 F.	-	-	Spencer point	-	-				
<b>New Bruns- wick, Bay of Fundy.</b>										
GRINDSTONE.	1 F.	12	60	W. part of Id.	45 43.2	64 37.4	Visible from N.E. by E. round by north to E. by S. or 315°.	11	47	41
ENRAGÉ.	1 F.	15	120	On the pitch of the Cape	45 35.6	64 46.9	Visible on the bearing of N.W. round south to N.E. Grindstone Lighthouse, N.E. by E. $\frac{1}{2}$ E., about 10 miles.			
QUACO.	1 Rev. ev. 20 s.	15	58	On a small rock off the head	45 19.3	65 31.9		11	25	30
ST. JOHN'S HARBOUR.	1 F.	20	119	Partridge Id.	45 14	66 3.1	A fog steam-whistle, 10 s. in ev. min. A bell-buoy near the E. side of Partridge Reef.			
"	1 F.	10	35	Beacon Tower	45 15	66 3.1	Leading light for the Spit.	11	21	27
LEPREAUX.	2 F. Vertical.	15	81 53	On the point	45 3.5	66 27.6	Visible from W.N.W. by south to E. by N.	11	18	24 $\frac{1}{2}$
CAMPOBELLO ID.	1 F.	15	64	N. pt. of Head Harbour	44 57.7	66 53.9				
Port St. Andrew	1 F.	10	35	N. pt. of entr.	45 4.2	67 4	Visible between N.W. by N. and S.E. by S.			
GRAND MANAN ISLAND, N.E. part.	1 F.	17	148	Swallow's Tail	44 45.9	66 44.1	Visible from S.W. round south to N.W.			
MACHIAS IDS.	2 F.	15	58 E 54 W	Eastern Light	44 30.1	67 6.2	55 yards apart. A gun fired ev. 4 h. during fog.	11	5	18
GANNET ROCK.	1 Rev. ev. 20 s.	12	66	Middle Rock	44 30.6	66 47	A gun is fired to answer signals during a fog.			

8. W. at & C.  
9. Rise of Springs.

M. Ft.

9 16

41 22

29 36  
30 48

47 41

35 30

21 27  
18 24½

5 18

# UNITED STATES.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
					Lat.	Long.		H.	M.	Ft.	
		Miles	Feet.		N. /	W. /		H.	M.	Ft.	
WEST QUODDY HEAD.	1 F.	17	133	On the Head, near Eastport	44 49	66 56.8	Fog-bell.	11	12	21	
Little River.	1 F. & Fl. ev. 1½ min.	12	40	On an Island, entrance of Harbour	44 39.7	67 11.7					
Round Island.	-	-	-	Entr. to Macias Bay	-	-	<i>Proposed.</i>				
Libby Island.	1 F.	13	52	On Island, entr. to Machias Bay	44 34.1	67 21.7	Fog-bell.				
MOOSE PEAK.	1 Rev. cv. 30 s.	14	65	Mistake Island	44 28.4	67 31.6	Bright flash ev. ¼ min.				
NASH'S ISLAND.	1 F. <i>Red.</i>	12	47	E. side of Pleasant River	44 27.8	67 44.5					
Narraguagus.	1 F.	12	45	S.E. pt., Pond Island	44 27.3	67 49.5	Guide to vessels entering Narraguagus Bay.				
PETIT MENAN.	1 F. & Fl. ev. 2 min.	17	125	S. end of Island	44 22	67 51.5	There are dangerous ledges from 2 to 5 miles on various bearings from this light. A Fog-bell.				
Winter Harbour.	1 F.	11	37	Mark Island, S. point	44 21.7	68 4.9	Guide to Winter and Mosquito Harbours.				
MOUNT DESERT.	1 F.	14	75	On the Rock	43 58.1	68 7.4	Fog-bell.	11	10	13	
BAKER'S ISLAND.	1 F. & Fl. ev. 1½ min.	17	105	Off Mt. Desert Island, and S. of entrance to Frenchman's Bay	44 14.4	68 11.6	Guide to Cranberry Island Harb.				
BEAR ISLAND.	1 F.	15	97	On one of the Cranberry Ids.	44 17.2	68 15.6	Guide to Northeast Harbour.				
Bass Harbour Head.	1 F. <i>Red.</i>	13	56	E. side of entr.	44 16.5	68 23.6	Guide to Bass Harbour.				
Spoon Island.	-	-	-	Haut Island	-	-	<i>Building.</i>				
<b>East Penobscot Bay.</b>											
Edgemoggin Reach.	1 F.	9	26	Green Island, S.E. point	44 15.8	68 27.7					
SADDLEBACK LEDGE.	1 F.	13	51	Near S.W. end of Isle au Haut	44 0.8	68 43.2	Dangerous ledges for nearly the whole distance between this light and Carver's Harbour.				
Heron Neck.	1 F. <i>Red.</i>	10	92	S. pt., Green Id. (Southern Fox Island)	44 1.5	68 51.4	Guide to Carver's Harbour and Hurricane Sound.				
Widow Island.	-	-	-	South Coast	-	-	<i>Proposed.</i>				

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Deer Island Thoroughfare.	1 F.	Miles 12	Feet. 52	Mark Island	44 8	68 41.9	Guide to Western entr. to Deer Island thoroughfare.	H. M.	Ft.
EAGLE ISLAND POINT.	1 F.	16½	106	On the Island	44 13	68 45.7	Guide to N. E. entr. of Penobscot Bay.		
Pumpkin.	1 F.	9	27	On the Island	44 18.6	68 44.2	Guide to Buck Harbour and to Edgemoggin Reach from the westward.		
MARTINICUS ROCK.	2 F.	15	85 90	On Rock	43 47	68 51	180 feet apart. A Fog-bell.		
WHITEHEAD.	1 F.	13	70	On Island	43 58.7	69 7.1	Fog-bell.		
<b>Penobscot Bay</b>									
OWL'S HEAD.	1 F.	16	100	W. side of entr., Penobscot Bay	44 5.5	69 2.3	Guide to vessels passing up and down the Bay, and to Rockland Harbour.		
Brown's Head.	1 F.	12	39	Southern Fox Island	44 6.7	68 54.2	At the west end of Fox Island thoroughfare.		
Negro Island.	1 F.	12½	52	S. side of entr. to Camden Harbour	44 12.1	69 2.6			
Grindel's Point.	1 F.	11	39	N. side, Gilkey Harbour	44 16.9	68 56.2			
DICE'S HEAD.	1 F.	17	130	Near Castine, W. side of entr.	44 22.9	68 48.5			
FORT POINT.	1 F.	16	103	Old Fort point	44 28	68 48.4	Marks the entrance to Penobscot River.		
Tenant Harbour	1 Rev. ev. min. <i>Red.</i>	13	66	N. E. side of S. Island	43 57.6	69 10.8			
Marshall Point	1 F.	10	31	On the point	43 55	69 15.3	Marking entrance to Herring-gut Harbour.		
MANHEIGIN.	1 Rev. ev. min.	19	175	On Island	43 45.9	69 18.6	Fog-bell. A Fog-bell also on Manana Island, one mile west of light.		
Franklin.	1 F. and Fl. ev. 1½ min.	12	54	N. end of Island, W. of St. George's River entrance	43 53.5	69 22.2	Guide to vessels bound to Thom- aston.		
PEMAQUID Pt.	1 F.	14½	75	S. W. entr. to Bristol Bay	43 50.2	69 30			
Burnt Island.	1 F.	13	61	W. side, Towns- end Harbour	43 49.5	69 38.1	Guide to Townsend Harbour.		
Hendrick Head	1 Rev. ev. ½ min.	12	40	E. side of Sheeps- cot River's mouth	43 49.3	69 41.1	Guide to Wiscasset.		
Pond Island.	1 F.	13	54	W. side of entr., Kennebec Riv.	43 44.4	69 45.9	Fog-bell. Guide for entering Kennebec River.	11 15	9½
SEGUIN ISLAND.	1 F.	20	180	On Island, off Kennebec Riv.	43 42.4	69 45.2	Fog-bell.		
<b>Casco Bay.</b>									
CAPE ELIZABETH	1 F. 1 R. ev. min.	17 17	143 143	On the Cape	43 33.8 43 33.9	70 11.8 70 11.7	300 yards apart. Fog-bell.		

LIGHTS AND TIDES.—UNITED STATES.

101

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
H. M.	Ft.			Miles	Feet.		° N.,	° W.,		H. M.	Ft.
		PORTLAND HARBOUR.	1 F.	17	101	On the Head	43 37.4	70 12.1	Fog-bell.	11 25	10
		"	1 F. <i>Red.</i>	8	23	N.E. end of Breakwater.	43 39.3	70 13.8			
		Wood Island.	1 Rev. ev. min. <i>Red.</i>	13	62	Near entrance, Saco Harbour	43 27.4	70 19.4	Guide to Winter Harbour, Maine.		
		Goat Island.	1 F.	11	38	N. side, Mouth of Cape Porpoise Harbour	43 21.4	70 25.2	Harbour of refuge.		
		BOON ISLAND.	1 F.	17½	133	Off York Harb., W. part of Id.	43 7.3	70 28.3			
		WHALE'S BACK.	1 F. and Fl. ev. 1½ min.	12½	58	N.E. side of outer entrance to Portsmouth Harbour.	43 3.5	70 41.5	Fog-bell.		
		PORTSMOUTH.	1 F.	14	70	Inner entrance of Harbour, S.W. side	43 4.2	70 42.2		11 23	10
		ISLAND OF SIGOALS.	1 R. ev. ½ min. <i>Red &amp; White</i>	15	87	White Island	43 58	70 37.1			
		Newbury Port	1 F.	13	54	S. side of entr. to Merrimack River	42 48.4	70 48.8	The beacon light will be moved as the channel changes.	11 22	9
		"	1 F. (Beacon.)	5	25½	Range in front					
		Ipswich Harbour	1 F. & Fl. ev. 1½ min.	12	40	S. side of entr. to the Harb.	42 41.1	70 45.6	The beacon light is shifted according as the channel changes.	11 26	10½
		"	1 F. (Beacon.)	9	20	Range in front					
		Annisquam Harbour.	1 F.	12½	50	E. side of entr. on Wigwam point	42 39.7	70 40.6		11 0	10½
		Straitsmouth Harbour.	1 F.	11	33	On Island, N. side of Cape Ann	42 39.7	70 35	A local light for Rockport, and channel inside the Salvages.	10 57	10½
		CAPE ANN.	2 F.	20 each	165½ each	On Thatcher's Island	N. 42 38.3 S. 42 38.2	70 34.2 70 34.2	298 yards apart. Visible round the horizon. Londoner Rock S.E. by E. ½ a mile. Fog-whistle sounded three times every min., and interval between each blast 14 s.		
		Gloucester Harb.	1 F.	13	60	On the point, E. side of Gloucester Harbour	42 34.8	70 39.5	Fog-bell. Guide to Gloucester Harbour, and also to vessels bound to Broad Sound, or near Boston light.	11 4	10½
11 15	9½	Ten Pound Id.	1 F.	12	49	In Gloucester Harbour	42 36.1	70 39.6	Guide to Gloucester Harbour.		
		BAKER ISLAND.	2 F.	15 13	87 64	S. side of N.E. entr. to Salem Harbour	42 32.2	70 46.8	40 feet apart, S.E. and N.W. When in range they clear the S.E. breakers. Fog-bell.	11 13	10½
		Marblehead	1 F.	12	43	S. side of entr. to Harbour	42 30.3	70 49.7	Serves for Marblehead and western entr. to Salem Harbour.	11 30	12

1 Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at E. & C.	9. Rise of Springs.
					Lat.	Long.			
Egg Rock.	1 F. <i>Red.</i>	Miles 8	Feet. 87	Off Nahant	42 26	70 53.5	Guide to Swampscot Harbour.	H. M.	Ft.
<b>Boston Bay.</b> MINOR LEDGE.	1 F.	15	92	Outer Minot, Cohasset Rks.	42 16.1	70 45.2	Fog-bell.		
Boston.	1 Rev. cv. $\frac{1}{2}$ min.	16	98	N. entrance of Harbour, on Little Brew- ster Island	42 19.6	70 53.1	Fog-bell.	11 12	11
Narrows.	1 F. <i>Red.</i>	7	35	On the W. end of Spit, abreast the Narrows	42 19.3	70 54.8	In one with Long Island Head light leads clear of Harding's Ledge.		
Long Island Head.	1 F.	15	80	N. E. end of Id.	42 19.8	70 57			
<b>Cape Cod Bay.</b> PLYMOUTH.	2 F.	15	93 each	Gurnet pt., north side of Harbour	42 0.2	70 35.7	31 feet apart, N.W. & S.E.; serve as a range to clear Brown's Bank coming from southward and eastward, and as a guide into Plymouth, Kingston, and Dux- bury.	11 19	11 $\frac{1}{2}$
Race Point.	1 F. & Fl. cv. $\frac{1}{2}$ min.	11	35	N.W. point of Cape Cod	42 3.7	70 14.3	Fog-bell, 300 feet N.N.E. from Tower. Serves as a guide to enter Cape Cod Bay.		
Long Point.	1 F.	11	28	On Shoal, S.W. entrance to Provincetown Harbour	42 1.9	70 9.8	Lantern on Low Tower, Keeper's Dwelling, for local purposes, is seen from Woodend Bar, and illuminates nearly the entire horizon into the Harbour.		
Mayo Beach.	1 F.	6	26	Head of Well- fleet Bay	42 55.8	70 1.7			
Billingsgate Id.	1 F.	12	40	N. side entr. to Wellfleet	41 52.2	70 3.7	- - - - -	11 5	13 $\frac{1}{2}$
Sandy Neck.	1 F.	11	33	W. side of entr. to Barnstable	41 43.3	70 16.5	- - - - -	11 22	10
CAPE COD, Highlands.	1 F.	20	195	Seaward side of Cape Cod	42 2.3	70 3.3			
Nauset Beach	3 F. (Beacons)	10 each	93 each	E. side of Cape Cod, at East- ham	41 51.6	69 56.7	150 feet apart, N. & S. Abreast of these lights the tides divide and run in opposite directions.		
CHATHAM HARB. East entrance to Vineyard Sound.	2 F.	14	70 each	W. side of Harb. on mainland	41 40.2	69 56.6	70 feet apart, N. & S.		
Monomoy Point.	1 F.	11	33	Monomoy Beach S. extremity of Cape Cod	41 33.5	69 59.3	This and the Chatham lights serve to guide vessels in going through the north channel on the south side of the Cape, passing N. of the Handkerchief and Bishop's and Clerk's Shoals. This light bearing N.W. by W. $\frac{1}{2}$ W. clears Pollock Flaps.	11 58	5 $\frac{1}{2}$



LIGHTS AND TIDES.—UNITED STATES.

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Spring.
							Lat.	Long.			
				Miles	Feet.		N.	W.		H. M.	Ft.
		POLLOCK RIP (Light Vessel.)	1 F.	12	45	Off Chatham, 4 miles, E. ½ S. from Monomoy lighthouse	41 32.6	69 53.1	Fog-bell, Horn and Gun. One <i>Red</i> hoop-iron day mark at mast-head. A North course from near this vessel, if made good, will take a vessel through the Slue in 3 fathoms at low tides. The <i>Black</i> buoy, distant ¼ a mile N. by E. from the vessel, must be left on the port hand.		
1 12	11	SHOVELL SHOAL (Lt. V.)	1 F.	11	40	2½ miles S.S.W. of W. from Monomoy pt. lighthouse	41 31.9	70 0.5	Fog-bell, Horn & Gun. One <i>Red</i> hoop-iron day mark at mast- head.		
		HANDKERCHIEF (Light Vessel)	1 F.	10	40	-	41 29.8	70 2.3	Fog-bell, Horn and Gun. Two hoops, <i>Black</i> , on each mast- head.		
1 19	11½	<b>Vineyard Sound.</b>									
		BASS RIVER.	1 F.	8	40	N. side of Vine- yard Sound	41 39.4	70 9.9	Guide to the anchorage inside the Breakwater.		
		BISHOP AND CLERK'S SHOAL	1 Rev. cv. ½ min.	14	59	N. part of shoal	41 34.5	70 14.7	Fog-bell.		
		Succonnesset Shoal (Lt. V.)	1 F.	10	40	Between Suc- connesset and Elbridge Shoals	41 32	70 26.3	Two <i>Red</i> hoops as day marks. Fog-bell, Horn and Gun.		
		GAY HEAD.	1 Fl. cv. 10 s.	20	170	W. point of Martha's Vine- yard Island	41 20.9	70 49.8	A rocky shoal lies N.W. 1½ miles from the lt. A guide to Vine- yard Sound and Buzzard Bay.	7 37	7
		HYAMMS.	1 F.	8	36	Inside the Breakwater	41 38.1	70 17	Leading light for Hyannis Harb. of Refuge on the main land. Course in N.N.E. for the light	12 22	4
1 5	13½	TUCKANUCK SHOAL (Lt. V.)	1 F.	7	36	Off Cross Rip, N.W. of Nan- tucket	41 26.7	70 17.1	Fog-bell, Horn and Gun. A <i>Red</i> hoop.		
1 22	10	Nantucket.	2 F. (Beacons)	4 each	8 10 46	On the Beach, N.W. of Harb.	-	-	300 feet apart, N.W. and S.E.		
		"	1 F.	11	46	Brant point	41 17.4	70 5.2	This Tower, in range with Nan- tucket Beacon, will clear Black Flat.		
		"	1 F. (Beacon)	5	10	-	-	-	Light shown from a wooden house, in front of Brant Point Lighthouse.	12 24	3½
		Cape Poge.	1 F.	13	55	On Choppaquid- dieh Island	41 25.2	70 26.7			
1 58	5½	Edgartown.	1 F.	12	37	N. side entr. of Harbour	41 23.4	70 29.8	- - - - -	12 16	2½
		Holmes Hole.	1 F.	12	60	West chop of Harbour	41 28.9	70 35.8	A guide through the Sound, and to Holmes Hole Harbour.	11 43	1½
		"	(Beacon)	-	-	-	41 26.9	70 35.6			
		Nonesque Point.	1 F.	13	80	E.S.E. of entr. to Woods Hole Harbour	41 30.9	70 39	Leading mark in running through Vineyard Sound.		

## LIGHTS AND TIDES.—UNITED STATES.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at P. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
					° N. / ° W.	' / '				
Tarpaulin Cove.	1 F.	Miles 13	Feet. 80	West side of the Cove on Naus- shon Island	41 28.1	70 45.1	- - - - -	H. 8 M. 4	Fe. 2 3/4	
Vineyard Sound (Light Vessel.)	2 F.	9	34 23	Near the Sow & Pigs Rocks	41 22	70 57	Fog-bell and horn. A dangerous rock lies on the range between the vessel and Dumpling light.			
Sow and Pigs.	-	-	-	On the Rocks	-	-	<i>Building.</i>			
NANTUCKET.	1 F.	14	70	Great point	41 23.4	70 2.4	Good anchorage inside the point in easterly weather, in 7 and 8 fathoms.			
SANKATY HEAD.	1 F. & Fl. for 10 s. ev. min.	20	150	S.E. part of Nantucket Island	41 17	69 57.6				
South Shoal (Light Vessel.)	2 F.	12 each	44 each	About 2 miles S. of the Shoal in 14 fathoms	40 56.5	69 51.5	NANTUCKET SHOALS painted on both sides; two hoops, <i>Red.</i> A Fog-bell, Horn and Guns.			
<b>Buzzards Bay</b>										
Cuttyhunk.	1 F.	12	42	S.W. point of Island	41 24.8	70 56.6	- - - - -	7 40	4 1/2	
Dumpling Rock.	1 F.	12	42	Off Round Hill	41 32.3	70 55				
Clarks Point.	1 F.	12	57	W. side of entr. to New Bed- ford Harbour	41 35.5	70 53.7				
Palmer Island.	1 F.	9	32	In New Bed- ford Harbour	41 37.6	70 54.2				
Nel's Point.	1 F.	11	43	E. side of Mattapoissett Harbour	41 39	70 47.4				
Bird Island.	1 F. (flash ev. 1 m. 20 s.)	10	35	E. side of entr. to Sippican Harbour	41 40.1	70 42.7	A guide to Warcham and up the Bay.	7 59	5 1/4	
Wings Neck.	1 F.	10	44	Head of Buz- zards Bay, in Sandwich	41 40.8	70 39.3	A guide to the head of Buzzards Bay.			
Rock Point.	-	-	-	W. entrance of Westport	-	-	<i>Building.</i>			
<b>Rhode Island.</b>										
Brenton Reef, (Light Vessel) in 13 fathoms.	2 F.	12 each	50 40	Off east entr. to Newport	-	-	Fog-bell and horn. Name on each quarter, <i>black</i> letters.			
BEAVER TAIL.	1 F.	15	96	S. pt. of Conan- icut Island, entr. to New- port Harbour	41 26.9	71 23.6	A Fog-whistle.			
<b>Narragansett Bay.</b>										
Lime Rock.	1 F.	11	30	S. side, New- port Harbour	-	-	To guide vessels through S. entrance.			
Goat Island, Newport Harb.	1 F.	11	33	N. end of Island, on end of Break- water	41 29.6	71 19.3	- - - - -	7 45	4 1/2	

LIGHTS AND TIDES.—UNITED STATES.

105

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
H. M. 8 4	Ft. 2 3/4	DUTCH ISLAND.	1 F.	Miles 14	Feet. 56	South end	41 29.8	71 23.9	Guide through west channel of Narragansett Bay, and to Dutch Island Harbour.	H. M.	Ft.
		Poplar Point.	1 F.	12	51	Near Wickford	41 34.2	71 26			
		Prudence Island.	1 F.	10	30	Sandy pt., E. side of Island	41 36.3	71 17.9	Guide through East Channel and to Fall River.		
		Bristol Ferry	1 F.	10	35	N. side of entr. to Mount Hope Bay	41 38.3	71 14.6	Guide to Fall River.		
		Warwick.	1 F.	14	54	South end of Warwick Neck	41 40	71 22.4			
		Nayat Point.	1 F.	12	31	Entrance to Providence River	41 43.5	71 20	A rocky shoal extends about 200 yards S. and W. of lighthouse.		
		POINT JUDITH.	1 Rev. ev. 15 s.	14	67	S. extreme of Narragansett shore	41 21.6	71 28.6	Between and nearly in range with Beaver Tail and Block Island lights.	7 32	3 3/4
		BLOCK ISLAND.	1 F.	14	65	N. point of Block Island	41 13.8	71 34.3	Not visible from S. E. to S. W. by S., or 80°, being hidden by the Island. To guide vessels clear of the low sand point.	7 36	3 3/4
7 40	4 1/4	WATCH HILL.	1 F.	14	62	Watch point, 3 miles S. E. of Stonington	41 18.2	71 51.2		9 0	3
		Montauk.	1 F. & Fl. ev. 2 min.	20	172	E. extreme of Long Island	41 4.2	71 51.1	Flashes seen from 3 to 5 miles further than the fixed light, which will be seen within its range as a steady fixed light between the flashes.	8 20	2 1/4
7 59	5 1/4	<b>Long Island Sound.</b>									
		Stonington.	1 F.	12	50	E. side of entr.	41 19.6	71 54		9 7	3 1/4
		EEL GRASS SHOAL (Lt. V.)	1 F.	10	32	Near the Shoal	41 18.4	71 56.7	Fog-bell and Horn. Ship Channel to the southward.		
		Morgan Point.	1 F.	11	41	N. side of Fisher's Island Sound	41 18.9	71 59			
		North Dumpling Island.	1 F. <i>Red.</i>	12	70	Fisher's Island Sound	- -	- -	Fog-bell.		
		NEW LONDON.	1 F.	14	86	W. side of entr. to River Thames	41 19	72 5.1	Fog-whistle sounded at intervals of 14 s., duration of each blast 6 s.	9 28	3
		BARTLETT'S REEF (Light Vessel.)	2 F.	10	28 35	Near Reef	41 16	72 7.5	Fog-bell and Horn.		
		LITTLE GULL ID.	1 F.	14	82	S. side, Long Island Sound	41 12.3	72 6.1	Fog-bell ev. 10 s. Marks entr. to Long Island Sound.	9 38	3
		<b>Gardiner's Bay.</b>									
		Gardiner's Id.	1 F.	6	29	On North point	41 8.3	72 8.2			
		Plum Island.	1 Rev. ev. 1/4 min.	12	63	On W. end of Island	41 10.4	72 12.4	To guide vessels through Plum Gut.		
7 45	4 1/4	Cedar Island.	1 F.	10	34	Entrance to Sag Harbour, Long Island	41 2.4	72 15.3			

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
					° N.	° W.			
<b>Connecticut River.</b>		Miles	Feet.					H. M.	Ft.
Saybrook.	1 F.	13	80	Lynde pt., W. side of Con- necticut River	41 16·2	72 20·3	Fog-bell. To guide vessels into Connecticut River.		
Calves' Island.	1 F.	3	-	Two miles below Essex Town; E. side	- -	- -			
Brockway's Reach.	1 F.	3	-	Two miles above Essex Town	- -	- -			
Devil's Wharf.	1 F.	3	-	Four miles above Essex Town	- -	- -			
<b>Long Island Sound.</b>									
CORNFIELD Pt. (Light Vessel).	1 F.	10	40	Long Sand Shoal S. side, about $\frac{1}{4}$ mile from centre of shoal, in $7\frac{1}{2}$ fathoms	41 13·5	72 22·8	Fog-bell and Horn. Square cage day mark, red.		
HORTONS POINT.	1 F.	18	110	On the point	41 4·9	72 26·6			
FAULKNER ID.	1 F. & Fl. ev. $1\frac{1}{2}$ min.	15	98	On the Island, off Guilford Harbour	41 12·7	72 38·9	To guide vessels through Long Island Sound, and clear of reefs in the vicinity of the island. Ship channel to the southward.		
NEW HAVEN.	1 F.	15	93	Five-mile point, E. side of entr.	41 14·9	72 53·9	Fog-bell.	11 16	6 $\frac{1}{2}$
"	1 F. Red.	-	21	Long Wharf, New Haven	- -	- -			
Stratford Point.	1 Rev. ev. $1\frac{1}{2}$ min	12	53	W. entrance to Stratford River	41 9·1	73 5·9	Fog-bell. To guide through Long Island Sound.		
STRATFORD PT. (Light Vessel)	2 F.	10	32 40	On Middle Ground, in 11 fathoms	- -	- -	Fog-bell and Horn. Lt. V. $\frac{1}{8}$ mile S.W. of shoalest part of reef. Ship channel to south- ward.		
Bridgeport.	1 F. Red.	6	23	About 2 miles S.W. by W. of the town	41 9·4	73 10·5		11 11	S
Old Field Point.	1 F.	13	67	S. side of Long Island Sound	40 58·6	73 6·8			
Black Rock Harbour.	1 F.	12	52	Fairweather Id.	41 8·5	73 12·7	Black Rock; Harbour of Refuge.		
EATON'S NECK.	1 F.	17	142	E. side of entr., Huntington Bay, Long Id.	40 57·2	73 23·4			
Lloyd's Harbour	1 F.	10	48	S.E. pt. of Neck, N. side of Harbour	40 54·9	73 25·7			
Norwalk Island.	1 F. & Red Fl. ev. 70 s.	11	40	W. entrance of river, and W. end of Island	41 2·9	73 24·8	To guide vessels through Long Island Sound, and into Norwalk River. S.S.W. $\frac{1}{4}$ a mile from lighthouse is a ledge of rocks.		
Great Captain Island.	1 F.	12	62	Near Greenwich point	40 58·9	73 37·1			
Execution Rocks	1 F.	12	54	Off Sands point	40 52·6	73 43·9	Fog bell.		

LIGHTS AND TIDES.—UNITED STATES.

107

8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
		SANDS POINT.	1 Rev. ev. 1/2 min.	Miles 15	Feet. 53	E. side of entr. to Cow Bay	40 51.9	73 43.5	- - - - -	H. M. 11 13	Ft. 9	
		Throggs Neck.	1 F.	10	66	On Fort Schuy- ler, at the S. E. pt. of Neck ; N. W. side of entrance to East River	40 48.3	73 47.1	Fog-bell 7 times per minute.	11 20	9 1/2	
		<b>New York and New Jersey.</b> MONTAUK.	1 F. & Fl. ev. 2 min.	20	172	On E. end of Long Island	41 4.2	71 51.1	Flashes seen from 3 to 5 miles further than the fixed light, which will be seen within its range as a steady fixed light between the flashes. (See page 105).	8 20	2 1/2	
		GREAT WEST BAY.	1 F.	20	160	N. side of Shin- necock Bay, at a mile from the Beach	40 50.9	72 29.9				
		FIRE ISLAND.	1 R. . . . .	22	166	E. side of Inlet, Long Island, S. side	40 37.9	73 12.8				
		<b>New York Bay.</b> SANDY HOOK (Light Vessel)	2 F.	10	45 each	Six miles from Sandy Hook and Navesink lights, in 15 fathoms	- -	- -	Fog-bell and Horn.			
		NAVESINK HIGH- LANDS.	2 F.	25	248 each	S. of Sandy Hook	40 23.8 40 23.7	73 58.9 73 58.8	100 yards apart.			
		SANDY HOOK.	1 F.	15	90	S. side of entr. to New York Harbour	40 27.6	73 59.8	To mark the entrance to and ranges for the Channel of New York Bay. Fog-bell.	7 29	5 1/2	
		"	1 F. (E. Beacon)	10	35	N. pt. of Sandy Hook	40 28.2	74 0.1	Marks N. pt. of Sandy Hook. Fog-bell.			
		"	1 F. (W. Beacon)	10	35	On the Bay side of Sandy Hook	40 27.8	74 0.1	When obscured by the screen, marks the outer edge of the bar, and when just clear to the northward of Sandy Hook light- house, the turning point round the S. W. spit into the main ship channel.			
		MAIN CHANNEL BEACONS.										
		Conover Beacon.	1 F.	12	60	Near the Beach	40 25.2	74 3	} Range lights for the Channel from S. W. spit to the Narrows			
		Chapel Hill Beacon.	1 F.	12	224	Back Station	40 23.8	74 3.2				
		GEDNEY'S CHAN- NEL BEACONS.										
		Point Comfort Beacon.	1 F.	12	40	Near the Beach	- -	- -	} Range lights from the inside of the bar to S. W. spit.			
		Waackaack.	1 F.	14	76	Near Waack- aack Beach	40 26.6	74 7.8				

8. W. at & C.  
9. Rise of Springs.  
M. Ft.  
16 6 1/2  
11 S

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at E. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
SWASH CHANNEL BEACONS.		Miles	Fect.							
Elm Tree Beacon	1 F.	14	59	Staten Island	40 33	74 54	Range lights for the Swash Channel from outside the bar to main channel, above Romer Stone beacon.			
New Drop Beacon.	1 F.	14	189	-	40 34.8	74 6.9				
PRINCESS BAY.	1 F. & Fl. ev. 2 min.	16	106	Near S. E. end of Staten Id.	40 30.4	74 12.5	To guide vessels to Amboy, and into Raritan River.			
FORT TOMPKINS.	1 F.	15	89	Staten Island, W. side of Narrows	40 36	74 2.9	To guide through the Narrows.			
ROBIN'S REEF.	1 F.	13	66	Off Tomkinsville, on the reef	40 39.4	74 3.6	Fog-bell.			
<b>Newark Bay, (N.J.)</b>										
Bergen Point.	1 F.	12	51	On a reef of rocks off the point, entr. to Newark Bay.	40 38.5	74 8.6	Fog-bell.			
Corner Stake.	1 F. Red.	-	-	Opposite Elizabeth Port	40 38.7	74 9.8	Stake light.			
Passaic River.	1 F.	12	51	Near the mouth of river, Newark Bay	40 41.7	74 7.3	Fog-bell. To clear Mud Flats on the west side of the Channel.			
Elbow Beacon.	1 F.	-	-	½ a mile N. of Passaic light	40 42.1	74 7.1	Stake light. To clear Mud Flats.			
<b>Hudson River, (New York.)</b>										
Stony Point.	1 F.	13	150	W. side of river, below West point	41 14.4	73 58	Fog-bell.			
West Point.	1 F.	10	38	On Gee's point, W. side	41 23.7	73 56.7	Marks the bend in the river, and may be approached close-to.	11	2	31
Esopus Meadows	1 F.	10	38	W. side, opposite Esopus	41 52.1	73 56.2	Clears Mud Flats, at the mouth of Esopus Creek.			
Rondout Creek.	1 F.	10	38	Opposite the entrance	41 55.2	73 57.7	Guides clear of Mud Flats at Rondout Creek.			
Saugerties.	1 F.	11	42	Mouth of Creek, W. side of Hudson River	42 4.3	73 55.5				
Four-mile Point.	1 F.	9	35	West side of river	42 18.3	73 46.7	To guide through West or Athens Channel.			
Coxsackie.	1 F.	11	38	West side of main channel	42 22.7	73 47.4				
Stuyvesant.	1 F.	10	38	East side	42 24.7	73 46.4				
New Baltimore.	1 F.	10	21	Little Island	-	-	Stake light (mast head lantern)			
Five-hook Id.	1 F.	10	25	On Calver's, Plat Island	-	-	" "			
Coeyman's Bar.	1 F.	10	25	N. end Poplar Island	-	-	" "			
Schodack Chan.	1 F.	10	25	W. side, Mull Plat Island	-	-	" "			

Nau  
LigCow Isl  
Van WiThe Co  
BARNEG  
SHOAL  
ABSECOMDELA  
BAY  
CAPE M" "  
CAPE H

Breakw

Brandy  
Shoal  
MauriceEgg Isl  
UPPER  
or Ch  
LEDGMahon  
CohanseBombay  
Reedy I

Christia

Fort Mi

FENWIC

LIGHTS AND TIDES.—UNITED STATES.

8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility: Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs. Ft.
							Lat.	Long.		H.	M.	
		Cow Island.	1 F.	9	21	E. side of river	-	-	Stake light (mast-head lantern.)			
		Van Wies Point.	1 E.	8	15	W. side of river, below Albany	-	-				
		<b>The Coast.</b>										
		BARNEGAT SHOALS.	1 Rev. ev. 10 s.	22	165	South side of Inlet	39 45.9	74 6				
		ABSECON.	1 F.	20	167	South side of Inlet	39 22	74 25				
		<b>DELAWARE BAY.</b>										
		CAPE MAY	2 F. (Lt. V.)	10 each	45 40	Near Five-fath. Bank, 16 miles off C. May, in 12 fathoms	38 53.5	74 39	Fog bell and Horn. Shoal part of the bank, 12 ft., lies N.W. $\frac{1}{2}$ N. distant $2\frac{1}{2}$ miles.			
		"	1 Rev. ev. $\frac{1}{2}$ min	19	152	N. side of entr. to Delaware Bay	38 55.8	74 57.3				
		CAPE HENLOPEN	1 F.	20	128	S. side of entr. to Delaware Bay	38 46.6	75 4.7	Large white sand-hills close to the lighthouse.	8	0	4 $\frac{1}{2}$
		"	1 F. (Beacon)	9	45	In range with C. Henlopen and Brandywine Shoal light	38 47.5	75 4.8	Approaching from southward or eastward to enter the Breakwater Harbour, after passing the Hen and Chicken Shoals, keep the light in range with the light on the Breakwater, until shoaling towards the point of the Cape—say $\frac{1}{4}$ of a mile—then haul up and leave the light on the port hand, not less than 200 yards.			
		Breakwater.	1 F. & Fl. ev. 45 s.	10	47	On Delaware Breakwater	38 47.9	75 6.1	Fog-bell.	8	0	4 $\frac{1}{2}$
		Brandywine Shoal.	1 F.	13	46	On the Shoal	38 59	75 6.5	Fog-bell.			
		Maurice River.	1 E.	10	45	S.W. side of Haystack Id.	39 11.6	75 1.8				
		Egg Island.	1 F.	11	45	N. side of Bay	39 10.5	75 8		9	4	7
		UPPER MIDDLE, or CROSS LEDGE (Lt. V.)	1 F.	9	39	W. side of Main Ship Channel	39 8.7	75 14.2	Fog-bell and Horn.			
		Mahon River.	1 F.	10	30	S. side of Bay	39 10.3	75 23.7		9	52	7
		Cohansey.	1 F.	11	46	N. side of Bay	39 20.3	75 21.3				
		Bombay Hook.	1 F.	11	46	N.W. end of Id.	39 21.8	75 30.3				
		Reedy Island.	1 F.	12	55	On the Island, S. point	39 30	75 33.8	Fog-bell.			
		Christiana River	1 F.	11	48	Wilmington	39 43.2	75 30.9				
		Fort Millin.	1 F.	7	28	On Pier, opposite the Light	39 52.1	75 12.7	Fog-bell.			
		FENWICK.	1 F. & Fl. ev. 2 min.	15	86	On the Island	38 27.1	75 2.8				

M. Ft.

1 2 3

## LIGHTS AND TIDES.—UNITED STATES.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
		Miles	Feet.		N.	W.		H. M.	Ft.
ASSATEAGUE ISLAND. *	1 F.	14	66	About 2 miles from S.W. pt. of Island	37 54.6	75 21.1	The centre of Winter Quarter Shoal bears E. by N. $\frac{3}{4}$ N., distant $11\frac{1}{2}$ miles; and the Chincoteague Shoals from the southward to E.S.E., about 5 miles from the lighthouse.		
Hog Island.	1 F.	13	60	On the W. pt. of the Island	37 23.3	75 41.6	Guide to coasters, and for entering the Great Matchepungo Inlet.		
<b>CHESAPEAKE BAY.</b>									
C. CHARLES.	1 F. & Fl. ev. min.	21	160	N.E. end of Smith Island; N. entrance to the Chesapeake	37 7.9	75 53.1		7 45	5
CAPE HENRY.	1 F.	17	129	S. side of entr. to the Chesapeake	36 55.5	76 0.2		7 40	4
<b>Hampton Roads, &amp;c.</b>									
Willoughby Spit (Light Vessel.)	2 F.	11	48 35	S. side of entr. to Hampton Roads	37 0.1	76 14.8	Fog-bell and Horn.		
Old Point Comfort.	1 F.	11	48	N. side of entr. to Hampton Rds. and James River	37 0	76 18.1	Fog-bell.	8 17	3
"	1 F. (Beacon.)	5	21	S.W. point	37 0	76 18.5	To guide to the anchorage inside Hampton Bar.		
Craney Island.	1 F.	13	51	W. side of entr. to Elizabeth River, near Norfolk	36 53.3	76 20	Fog-bell and Horn.		
Naval Hospital.	1 F.	6		On the Wharf, Washington point	36 50.8	76 17.8			
<b>James River.</b>									
White Shoal.	1 F.	9	27	Below Sandy point	37 1.4	76 31.5	Fog-bell	2 11	3
Point of Shoals.	1 F.	9	27	On the point of Shoals	37 3.8	76 39.2	Fog-bell.		
Deep Water Shoals.	1 F.	9	27	On the Shoal, starboard side, going up	37 8.2	76 38	Fog-bell.		
Jordan's Point.	1 F.	10	35	On the point, port side, going up	37 18.7	77 13.1			
Cherrystone Inlet.	1 F.	11	36	W. side of entr.	37 15.6	76 1.8			

\* Many of the Lighthouses from Assateague Island southward, during the late war, were destroyed, or their lights extinguished. These in many instances have since been restored, and the process of re-lighting the remainder is gradually taking place.



LIGHTS AND TIDES.—UNITED STATES.

111

8. W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
M.	Ft.			Miles	Fect.		N.	W.		H. M.	Ft.
		Back River.	1 Rev. ev. 1½ min	10	35	S. side of entr.	37 5·2	76 15·9			
		York Spit (Light Vessel.)	2 F.	9	40	Off the Spit	37 12	76 13·7	Fog-bell and Horn.		
		New Point Com- fort.	1 F.	13	60	N. side of entr. to Mobjaek Bay	37 18	76 16·4			
		Wolftrap Shoals (Light Vessel.)	2 F.	10	30 38	Between the York & Rap- pahannock Rivers, E. side of Shoal	37 23·3	76 10	Fog-bell and Horn.		
		Stingray Point.	1 F. <i>Red.</i>	7	36	S. side of Rap- pahannock River	37 33·6	76 16·1			
7 45	5	Windmill Point (Light Vessel.)	1 F.	10	34	S. E. part of Shoal, N. side of entrance to Rappahannock River	37 34·8	76 11·5	Fog-bell and Horn.		
7 40	4	Watt's Island.	1 F. and Fl.	12	46	S. end; E. side of Tangier Sound	37 46·9	75 53·3			
		JANE ISLAND (Light Vessel.)	1 F.	16	30	Off the Tail of Jane Bar, Tangier Sound	37 57·6	77 55·4	Fog-bell and Horn.		
		SMITH POINT. (Light Vessel.)	2 F.	10	35 39	S. E. side of entr. to Potomac River	37 52·7	76 10·1	Fog-bell and Horn.		
8 17	3	Fog Point.	1 F.	10	30	On Smith Id., opposite the entrance to Potomac River	38 2·1	76 2·2			
		Clay Island.	1 F.	10	36	Entrance to Nanticoke River	38 13·9	75 58·1			
		Lookout Point.	1 F.	10	37	N. side of entr. to Potomac River	38 2·3	76 19		12 58	2
		HOOPER'S STRAITS (Light Vessel.)	1 F.	10	34	In the Channel, between Hooper's and Goldsboro' Islands	38 13	76 5	Fog-bell and Horn.		
2 11	3	Cove Point.	1 F. and Fl. ev. 1½ min.	11	46	Four miles N. of entrance to Patuxent River	38 23·1	76 22·6	Fog-bell.		
		Sharp Island.	1 F.	10	41	N. pt. of Island, entrance of Choptank River	38 37·7	76 21·9			
		Thomas Point.	1 F.	12	63	Four miles S. of entrance to Annapolis	38 54·4	76 26·9			
		Greenbury Point	1 F.	11	50	N. side of entr. to Annapolis	38 58·5	76 27			
		Sandy Point.	1 F. & Fl. ev. 1½ min.	12	50	On the point	39 1	76 23·5	Fog-bell.		

ingulshed.  
g place.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
<b>Patapsco River.</b>		Miles	Fect.		N.	W.		H. M.	Ft.
Seven Foot Knoll.	1 F.	11	43	Entrance to Patapsco River	39 9 2	76 24 1	Fog-bell; Fog-horn sounded ev. 5 min.	6 8	1 1/4
North Point.	2 F.	10	31 42	N. side of the entrance to Patapsco River	39 11 6 39 11 8	76 26 2 76 26 6	To range with main channel.		
Fort Carroll.	1 F.	10	75	On the Fort, Patapsco River	39 12 8	76 30 9	Fog-bell. To guide vessels clear of Fortification Works.		
Lazaretto Point.	1 F.	10	35	N. side of Baltimore Harb.	39 15 7	76 34		6 59	1 1/4
<b>Upper part of Chesapeake Bay, &amp; Susquehanna River.</b>									
Pool Island.	1 F.	10	35	Off the mouth of Gunpowder River	39 17 4	76 15 7	Fog-bell.		
Turkey Point.	1 F.	12	65	On the Bluff Pt. separating the Elk and Susquehanna Rivers	39 26 9	76 0 2			
Fishing Battery.	1 F.	10	36	On the Battery	39 29 6	76 4 7			
Havre de Grace.	1 F.	10	40	Concord point, entrance of Susquehanna River	39 32 4	76 4 8			
<b>Potomac River.</b>									
Piney Point.	1 F.	10	35	E. side of Potomac River, about 14 miles N.W. of entr.	38 8	76 31 5			
Blackstone Id.	1 F.	11	46	Near the entr. of Clement Bay	38 12 4	76 44 4			
LOW CEDAR PT. (Light Vessel.)	1 F.	8 or 9	22	Between Cedar and Yates pt., Potomac River	38 21	77 0 5	Fog-bell and Horn.		
UPPER CEDAR POINT (Lt. V.)	1 F.	8 or 9	28	Opposite the Mouth of Tobacco River	38 24	77 3 5	Fog-bell and Horn.		
Fort Washington	1 F.	6	-	On the Wharf	38 43 4	77 1 2		8 10	3 1/4
Jones' Point.	1 F.	10	35	Near Alexandria	38 47 4	77 2 1			
<b>Rappahanock River.</b>									
Bowler Rock (Light Vessel.)	1 F.	5	-	-	37 49 2	76 43 3	To clear the Rock. Fog-bell and Horn.		
<b>THE COAST.</b>									
BODIES ISLAND.	1 Rev. ev. 1 1/4 min.	15	90	1 1/2 miles S. of an Inlet	35 47 3	75 31 7			

LIGHTS AND TIDES.—UNITED STATES.

113

8 W. at & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility. Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs. Ft.
							Lat.	Long.		H.	M.	
		CAPE HATTERAS.	1 Fl. ev. 15 s.	20	150	About 2 miles N. of the extr. of the Cape	35 15.1	75 30.9	Very dangerous Shoals lie in a south-easterly direction, distant 9 to 10 miles from the light, with 9 feet water on them. There is a flash of 6 s. duration followed by an eclipse of 9 s. in ev. 15 s. of time.	7	4	24
		"	1 F. (Beacon.)	6	25	500 yards from extremity of point	-	-	-			
		OCRACOCKE.	1 F.	15	75	Near the entr. to the Inlet, about 23 miles from Cape Hatteras	35 6.5	75 58.9	-	7	4	24
		<b>Pamplico Sound.</b>										
		Royal Shoal (Light Vessel.)	1 F.	11	43	On S.W. point of Shoal	-	-	-			
		Royal Shoal.	1 F. & Fl.	11	33	On N.W. point	-	-	-			
		Harbour Island (Light Vessel.)	1 F.	10	34	On Bar of Id., between Pam- plico and Core Sounds	-	-	-			
		Brant Island Shoal.	1 F.	11	41	In southern part of Pamplico Sound	-	-	-			
		Neuse River.	1 F.	11	41	Off East end of Piney point	-	-	-			
		Pamplico Point.	1 F.	11	37	S. side of Pam- plico River	35 19.4	76 31.3				
		Long Shoal (Light Vessel.)	1 F.	11	46	E. pt. of Shoal	-	-	-			
		Roanoke Marshes.	1 F.	11	33	Midway in the Chan. connect- ing Pamplico and Croatan Sounds	-	-	-			
		Croatan.	1 F.	10	37	Between Croatan and Albemarle Sounds	-	-	-			
		<b>Albemarle Sound.</b>										
		Wade Point, extremity of the Shoal.	1 F.	10	31	W. side, Pas- quotank River	-	-	-			
		ROANOKE RIVER (Light Vessel.)	1 F.	11	41	Near its entr.	-	-	-			
		CAPE LOOK OUT.	1 F.	22	156	Near the extr. of the Cape	34 37.3	76 31.1				
		BOGUE BANKS, BEAUFORT HARBOUR.	2 F.	10 each	50 30	200 yds. behind Fort Macon, the other 1/2 of a mile in front	34 41.7	76 40.5	Shifted as the channel changes.	7	26	34

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
FEDERAL POINT.	1 F.	Miles 12	Feet. 46	N. side of Inlet to Cape Fear River	33 58.1	77 54.9		H.	M.	Ft.
Frying-pan Shoals (Lt. V.)	2 F.	12	40 each	In 10 fathoms, one mile beyond the outer shoal of 18 ft.	33 35	77 50	Fog-bell and Horn. Never go into less than 15 fathoms. A day mark, black, on each mast.			
CAPE FEAR.	1 F.	16	177	On Bald Head, E. side of entr. to Cape Fear River; 4 miles from the pitch of the Cape	33 52.3	77 59.8		7	26	5
<b>Cape Fear River.</b>										
Oak Island.	2 F.	9 each	37 27	On Island, S. of Main Channel	33 53.4	78 1.6	Fog-bell.			
Price's Creek.	2 F.	9 each	25 35	Entrance of Creek, W. Bank	33 56.1	77 59.2				
HORSE-SHOE (Light Vessel.)	1 F.	16	43	Between New Inlet and Price's Creek	33 56.3	77 57.4	Fog-bell and Horn.			
Campbell's Id.	1 F.	9	25	On S. W. corner of Island	34 6.9	77 56				
Horton's Point.	1 F.	9	22	W. Bank of Cape Fear River	34 3.4	77 56.2				
Upper Jetty Range.	2 F.	8	42 65	E. side of Cape Fear River, 3 miles below Wilmington	34 12.8	77 56.3	267 yards apart. The rear one is a beacon, open framework.			
GEORGETOWN.	1 F.	14	85	S. end of N. Id., E. side of entr. to Pedee River	33 13.3	79 10.9		8	40	4½
Fort Point.	1 F.	9	34	On the point	33 21.3	79 12.3				
CAPE ROMAIN.	1 Rev. ev. min.	23	150	On Raccoon Key, 6 miles from the extremity of the shoals, off the Cape	33 1.1	79 22.2	The old tower stands near the new tower. Its elevation is 65 feet, and it is painted with red and white stripes.			
Bull Bay.	1 F.	11	35	N. end of Bull Island	32 55.3	79 33.7		7	16	5½
Rattlesnake Shoals (Lt. V.)	2 F.	12 each	44 each	Opposite N. end of Sullivan Id. in 6 fathoms	32 44.1	79 43.6	Fog-bell and Horn. Two black oval day marks at the mast-head			
CHARLESTON.	1 F.	20	133	On Morris Id., and W. side of Ship Channel	32 41.9	79 52.5	These lights in line are a mark for crossing the bar in the deepest water.			
Sullivan Island	1 F. (Beacon.)	10	50							
	1 F. (Beacons.)	10 each	45 50	On Sullivan Id.	32 46.8 32 45.5	79 51.3 79 51.2	To guide over Charleston Bar.			
Fort Sumter.	1 F.	10	57	Charleston Harbour	32 45.1	79 52.2				

Na  
L.

Castle

Battery

Huntin

Cambal  
(Ligh  
Martin  
(LighCalibog  
(Ligh

TYBEE.

Savann  
RiveTybee I  
(LighCocksp  
BeacOyster  
BeacFig Isl  
Beac

Savann

Sapelo

Wolf I  
BeacSE. SIM  
LITTLE

LAND

LIGHTS AND TIDES.—UNITED STATES.

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
							Lat.	Long.		H.	M.	
		Castle Pinckney.	1 F. <i>Red.</i>	Miles 1'	Feet. 50	Charleston Harbour	32 46.4	79 54.4		H.	M.	Ft.
		Battery	1 F. (Beacon.)	-	45	E. end of Charleston Battery	- -	- -		7	26	6
		Hunting.	1 Rev. ev. ½ min.	17	108	N. pt. of Island	32 24.3	80 24.7	The main light, beacon, and outer buoy of the Slough are all in line, bearing S. 77° W. by compass.			
		..	1 F. (Beacon)	-	39	- -	- -	- -	To range with main light.			
		Cambahee Bank (Light Vessel.)	1 F.	10	30	Off the shoal	- -	- -	Fog-bell and Horn alternately ev. 5 min.			
		Martin Industry (Light Vessel.)	2 F.	12	44 each	15 miles east- ward of Tybee light	32 5.5	80 35.2	Fog-bell and Horn.			
		Calibogue (Light Vessel.)	1 F.	10	30	In the Sound, in 4½ fathoms	- -	- -	Fog-bell and Horn.			
		TYBEE.	1 F.	16	108	N. E. end of Tybee Island, and S. side of entr. to Savannah River	32 1.3	80 50.5	Beacon light ¾ mile E. of main light.			
		1 F. (Beacon.)	12	62								
		<b>Savannah River.</b>										
		Tybee Knoll (Light Vessel.)	1 F.	10	40	Off the Knoll, N. of Island	- -	- -	Fog-bell and Horn.			
		Cockspur Island Beacon.	1 F.	9	25	On a Knoll con- nected with East end of Island	32 1.4	80 52.6				
		Oyster Beds Beacon.	1 F. <i>Red.</i>	9	35	On the Beds, opposite Cock- spur Island	32 2.4	80 53.5	Fog-bell.			
		Fog Island Beacon.	1 F.	9	26	On E. end of Island, Savan- nah River	32 4.9	81 3.5	Fog bell.			
		Savannah Bay.	1 F. <i>Red.</i>	9	77	E. end, in Savannah City	- -	- -	A gas light on an iron shaft.	8	13	7½
		Sapelo Island.	1 F. & Fl. ev. 40 s.	14	74	S. end of Island and N. side of entrance to Doboy Sound	31 23.5	81 16.9	The lights in one lead			
		..	1 F. (Beacon.)	11	50	In front of sea- ward of the former	31 23.4	81 16.8		7	33	7½
		Wolf Island Beacons.	2 F.	9 each	25 15	Near N. end of Island	31 21	81 16.5				
		St. SIMON'S.	1 F.	14	80	South end of Id.	31 8	81 23.4		7	43	8½
		LITTLE CUMBER- LAND ISLAND.	1 F.	14	70	S. side of entr. to St. Andrew Sound, and the Santilla River	30 58.6	81 24.6				

H. M. Ft.  
7 26 5

8 40 4½

7 16 5½

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Spring.
					Lat.	Long.		H.	M.	
<b>Florida.</b>										
AMELIA ISLAND.	1 Rev. ev. 1½ min.	17	104	N. end of Island and S. side centr. to St. Mary's River	30 40.4	81 26.3				
"	1 F. (Beacon)	6	-	In front of main light	-	-				
"	2 F. (North Beacons.)	11 14	35 60	N. front of Amelia Id.	-	-				
ST. JOHN'S RIVER.	1 F.	14	75	S. side of the entr. to Jacksonville	30 23.7	81 24.7		7 28	5¼	
Dame's Point Light Boat.	1 F.	5	-	Off the point, in St. John's River	-	-	Fog-bell and Horn.			
ST. AUGUSTINE.	1 F. and Fl. ev. 1½ min.	14	68	N. end of Anastasia Island, and S. side of entr. to St. Augustine	29 53.2	81 16.9		8 21	5	
CAPE CANAVERAL.	1 Rev. ev. min.	14	65	N. E. part of the Cape	28 27	80 33	Dangerous shoals 6 and 11½ miles off, N. E. by N. to N. E. by E. ¼ E. A new lighthouse is erecting.			
<b>Florida Reefs</b>										
JUPITER INLET.	1 F. & Fl. ev. 1½ min.	20	146	Between Jupiter Inlet and Gilbert Bars	26 55.4	80 5.1				
CAPE FLORIDA.	1 F.	18	100	On S. point of Key Biscayne	25 39.9	80 9.4		8 34	1¼	
CARYSFORT.	1 Rev. ev. 30 s.	18	106	On the Reef	25 13.2	80 12.7				
COFFIN PATCHES and SOMBREIRO KEY.	1 F.	19	144	Off Dry Bank	24 37.6	81 6.7				
SAND KEY.	1 F. (Flash ev. 2 min.)	18	110	S. W., about 7½ miles from Key West Lighthouse	21 27.2	81 52.7	It shows for the space of 1 min. a clear steady light; in ev. alternate min. there is a brilliant flash of 10 s. duration, preceded and followed by partial eclipses of 25 s. duration.	8 40	2	
KEY WEST.	1 F.	13	50	S. W. point of Island	24 33	81 48.1	Serves to guide to Key West through the different channels across the reef, and also inside of the reef.	9 30	1¼	
"	1 F.	12	40	N. W. Passage	24 37.1	81 54		9 10	1¼	
DRY TORTUGAS.	1 F.	20	152	On Loggerhead, or S. W. Key	24 37.3	82 55.2				
DRY TORTUGAS HARBOR.	1 F.	14	70	On Jefferson Fort, Garden Key	24 37.8	82 52.9		9 56	1¼	
EGMONT.	1 F.	12	45	Entrance of Tampa Bay, on Egmont Key	27 36	82 45.2				

LIGHTS AND TIDES.—UNITED STATES.

117

8. H. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
							Lat.	Long.		H.	M.	Ft.	
		CEDAR KEYS.	1 F. & Fl. ev min.	15	75	Seahorse Key,	N. 29 5' 8"	W. 83 4' 8"	A reef extends 12 miles in a south westerly direction from Seahorse Key.	H. 0	M. 51	Ft. 34	
		St. MARK'S HARBOUR.	1 F.	14	73	E. side of entr.	30 4' 4"	84 10' 6"	- - - - -	1	14	3	
		DOG ISLAND.	1 R. ev. min.	13	48	E. side of mid- dle entrance to St. George Sound	29 46' 8"	84 38' 6"	- - - - -				
		St. GEORGE.	1 F.	15	77	On the Cape	29 35' 2"	85 2' 7"	- - - - -				
7 28	5½	SAN BLAS.	1 Rev. ev. 1½ min.	16	96	On the Cape, 2 miles from the S. point	29 39' 8"	85 21' 6"	A dangerous shoal extends in a southerly direction from the Cape 6 miles.				
		<b>Pensacola Harbour.</b>											
8 21	5	PENSACOLA.	1 Rev. ev min.	21	210	S. side of entr. to the Bay, near Barancas	30 20' 8"	87 17' 3"	There are five beacons F. lights in the Harbour to avoid the Caycas and Middle Shoals. The Beacon lights are each visible 4 miles.			1½	
		<b>Mobile Bay.</b>											
		SAND ISLAND.	1 F.	9	48	Three miles S.S. W. of Mobile point	30 11' 3"	88 2'	Marks the approach to Mobile Bar and entrance.				
		"	2 F. (Beacons.)	10	34	On S. and E. points	- - - -	- - - -	Red light on the E. point.				
8 34	1¼	MOBILE POINT.	1 F.	9	28	E. side of entr. to Bay	30 13' 8"	88 0' 5"	- - - - -			1-2	
		"	2 F. (Beacons.)	9	20	- - - -	- - - -	- - - -	One Red light.				
		Choctaw Point.	1 F.	11	45	A little S. of Mobile City	30 40' 2"	88 1' 1"	- - - - -				
		Choctaw Pass	2 F. (Beacons.)	3	15	In the Pass	- - - -	- - - -	Small lights, making a range leading through Choctaw Pass.				
8 40	2	Grant's Pass.	1 F.	6	24	Opposite Fort Powell, S. side of Channel	- - - -	- - - -	- - - - -				
		<b>Mississippi Sound.</b>											
9 30	1¼	ROUND ISLAND.	1 F.	12	51	Off Pascagoula Bay	30 17' 5"	88 34' 2"	- - - - -				
9 10	1¼	East Pascagoula River.	1 F.	10	-	At East Pasca- goula	30 21'	88 33' 1"	- - - - -				
		SHIP ISLAND.	1 F.	13	51	West end	30 12' 9"	88 57'	- - - - -				
9 56	1¼	BLOXI.	1 F.	13	62	W. of western entrance to Bay	30 23' 7"	88 53' 1"	- - - - -				
		CAT ISLAND.	1 F.	12	39	West point	30 13' 9"	89 8' 7"	- - - - -				
		PASS CHRISTIAN.	1 F.	12	42	N.W. of Cat Island light, 6½ miles	30 18' 9"	89 14'	- - - - -				

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Merrill Shell Bank.	1 F.	Miles 11	Fect. 45	Between Cat Island, St. Joseph's, and Grand Island	30 14.3	89 14.5		H. M.	Ft.
St. Joseph's Id.	1	-	-	-	30 11.1	89 24.6			
Pleasanton's Id.	1 F.	13	60	Near entrance to Pearl River, E. entr. to Lake Pontchartrain	30 9.3	89 38.1			
Proctorville	1 F. (Beacon.)	10	39	Lake Borgno	29 52.4	89 39.5	Destroyed by a gale, August, 1860		
<b>Lake Pontchartrain.</b>									
West Rigolet.	1 F.	10	30	E. entr., Lake Pontchartrain	30 10.6	89 43.6			
Bon Fouca.	1 F.	11	39	Near the mouth of Bayou Bon Fouca	30 15.1	89 51			
Port Pontchartrain.	1 F. and Fl. ev. 1½ min.	10	35	Near E. end of Railroad	30 2.3	90 2.8			
Bayou St. John.	1 F.	10	39	5 miles N. of New Orleans	30 1.9	90 4	Destroyed by a gale, August, 1860		
New Canal.	1 F.	10	33	At the entrance	30 1.7	90 5.8			
Tehefuncti River	1 F.	11	38	Near Madisonville	30 23	90 6			
Pass Manchac.	1 F.	10	45	Between Lakes Maurepas and Pontchartrain	30 17.8	90 12.7			
<b>CHANDELEUR.</b>	1 F.	13	50	N. end of Island	30 3.1	88 51.6	Good anchorage in 4 fathoms, with the light bearing N.E. 2 miles.		
<b>Mouth of Mississippi River</b>									
PASSE A L'OUTRE	1 F. & Fl. ev. 45 s.	15	77	Middle Ground Island, N. side of entrance	29 11.5	89 1.5	Lighthouse bears W. ¼ N. (mag.) from the large nun buoy outside the bar. (1865.)		
SOUTH PASS.	1 Rev. ev. 1½ min.	13	60	Entrance of S. pass of river; S.W. side of Gordon Island	29 1	89 9			
Head of the Passes.	1 F.	5	-	On Deer Island at the S.W. & N.E. Junction of the Passes	29 8.6	89 14.1	Guide to the Passes in descending the river.		
SOUTH-WEST PASS.	1 F.	15	70	Entrance of river, W. side	28 58.5	89 21	Visible 90° or from N.E. round south to N.W.	-	1½
Barrataria Bay.	1 F.	13	60	Grand Terre Id., centr. of Bay	-	-			
Timballier Bay.	1 F.	13	60	On Timballier Island	29 4	90 16.5		-	1½



LIGHTS AND TIDES.—UNITED STATES.

8. L. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
1. M.	Ft.			Miles	Fcct.		N.	W.		H. M.	Ft.
		SHIP SHOAL.	1 Rev. ev. ½ min.	16	110	On Ship Shoal, off Raccoon pt.	28 55.1	91 5.9			
		South-west Reef.	1 F. <i>Red.</i>	12	49	At the entrance of Atchafalaya Bay	29 25	91 30	Fog-bell and Horn.		2
		SHELL KEYS.	1 F.	15	71	On the south pt. of Marsh Island, one of the Shell Keys	29 24	91 49			
		SABINE PASS.	1 F. & Fl. ev. 1½ min.	16	85	Brant point, E. side of Sabine River	29 43.9	93 50.3	To cross the bar bring the light- house to bear N.W. by N.; run in N.W., leaving Louisiana point 300 yards on starboard hand. (1866.)		1½
		BOLIV. R POINT.	1 F.	7	40	N. side of entr. to Galveston, N. 66° E., 835 yards from former light- house	29 22	94 45.6	Strangers should not approach Galveston Bar from the east- ward, without a pilot, in less than 7 fathoms. May anchor in 7 fathoms with light bearing N.W.		
		"	1 F. (Beacon.)	6	-	On Bird Island	-	-	To range with Bolivar point.		
		<b>Galveston Bay.</b>									
		Pelican Spit.	2 F.	6	35	On the Spit	29 21	94 44.1			
		Galveston Beacons.	2 F.	-	44 30	In the City	-	-			
		Half-Moon Shoal	1 F.	10	35	Between Pelican Island and Dollar point	29 24	94 50.5	Fog-bell. To clear Half moon Shoal.		1½
		Red Fish Bar.	1 F.	10	35	To mark the Channel	29 30.8	94 51.7	Fog-bell.		
		Cleppers Bar.	1 F.	10	35	To mark the Channel	29 41.2	94 56.5	Fog-bell.		
		<b>Matagorda Bay.</b>									
		MATAGORDA.	1 Rev. ev. 1½ min	16	96	E. pt. of Island	28 20.8	96 23.5			
		Salmria.	1 F.	6	33	On North side	28 24.1	96 23.8			
		Half-Moon Reef.	1 F. <i>Red.</i>	6	40	On S. extremity	28 33	96 15.5	Fog-horn sounded ev. 5 min.		
		Swash.	1 F.	6	38	Opposite Alliga- tor Head	-	-	Fog-horn sounded ev. 5 min.		
	14	ARANSAS PASS.	1 F.	13	60	Low Island	27 51.8	97 3			
		BRAZOS SAN- TIAGO.	1 F.	7½	43	N. end of Brazos Island	26 6	97 12			1½
		"	1 F. & Fl. ev. min.	16	82	Isabel Point	26 4.9	97 11.1			
	14	Rio Grande.	-	-	-	-	-	-	Building.		

## WEST INDIA ISLANDS.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Barbados.	1 Rev. ex. min. Eclipse 24 s.	Miles 18	Feet. 145	S. point, 200 yards in shore	13 2·7	59 33·2	Does not show until it bears to the westward of S.W. by W., and to be kept well open in order to clear the Cobbler Reefs.	H. M. irr.	Ft. 2
..	1 F. Brt. Red	8 3	34	Carlisle Bay, Needham pt.	13 4	59 36·8	Red to the northward of East, and White to the southward of East.		
TOBAGO.	1 F.	12	128	Scarborough, on Bacolet, or Red point	11 10	60 44	Visible between E.N.E. and S.W. by W. by the south.	irr.	3¼
Trinidad.	1 F.	15	50	Port Espana, on the Jetty	10 38·7	61 31	Visible from N.E. by N. to S.E. by the west.	4 30	4
St. Vincent.	1 F.	6	640	Fort Charlotte	13 13	61 15	For mail steamer when expected.	3 0	1¼
St. Lucia.	1 F. Red.	3	80	Tapion Battery, S. entrance of Castries Harb.	40 0	61 1	For mail steamer when expected.		
..	1 F.	-	-	On the Wharf	- -	- -	For mail steamer.		
Martinique.	1 F.	11	62	Pointe des Negres, in the Fort	14 36	61 3·1			
..	1 F.	6	131	Fort Royal	14 36·1	61 4·2	Red from W.N.W. to W.S.W.	4 0	
..	1 F. Red.	5	-	St. Martha pt.	14 44·0	61 11			
..	1 F.	5	-	Westward of former	- -	- -	Orange to the northward, Blue to the west, Green to the south. The White and Blue lights in a line lead to the anchorage.		
..	1 F.	2	-	Edge of the Bank, St. Pierre Bay.	- -	- -	Lighted on the day the mail is expected, and for three nights after if not arrived.		
..	1 F.	24	410	Caravelle, Peninsula, Caracof Mountain, ½ of a mile inland	14 46·2	60 52·9			
Dominica.	1 F.	-	-	On Fort Young Flagstaff	15 17·4	61 23·1			
GUADALOUPE	1 F.	15	108	On Petite Terre, 202 yards from the Eastern part	16 10·5	61 5·1	The Balaine Rock lies S. 19° W., ½ a mile.		
..	1 F.	-	-	Gozier Islet	16 14·1	61 24·7			
..	1 F.	-	-	Mouron Islet	- -	- -			
..	1 F.	-	-	S. of the Town of Pointe-à-Pitre	- -	- -			

1

Name of Light

GUADALOUPE

Antigua.

Montserrat

St. Christopher

SOMBRERON

St. Thomas

Santa Cruz

St. Croix

"

PUERTO RICO

HAITI.

"

JAMAICA.

"

"

Island of

St. JAGO

CRUX.

NAGUA, O

FUEGOS

Cochinos

Batabano

ISLE OF

SAN ANTONIO

JULIAS.

GOBERNA

HAVANA.

Santa Cruz

GUANOS.

LIGHTS AND TIDES.—WEST INDIA ISLANDS.

1.	2.	3.	4.	5.	6.		7.	8.	9.
					Position.				
Name of Light.	No. of Lights, Character, &c.	Visibility.	Height of Light above the Sea.	Where placed.	Lat.	Long.	REMARKS.	H. W. at F. & C.	Rise of Springs.
		Miles	Feet.		° N.	° W.		H. M.	Ft.
GUADALOUPE.	1 F.	7	-	Monte de Port	16 23.7	61 21	<i>Position uncertain.</i>		
Antigua.	3 F.	8	62	English Harb., Fort Berkeley	17 0	61 45.3	<i>Temporary</i> , for mail when expected. The upper light is <i>Red</i> . On a staff, triangular, 5 yards apart.		2
Montserrat.	2 F.	-	-	On the Beach, Plymouth	16 43	62 12	For the mail when expected.		
St. Christopher	1 F. <i>Red</i> .	12	37	On the Beach, Basse Terre	17 18	62 42.8	N. by W. $\frac{1}{2}$ W. leads to the anchorage.		
SOMBRERO.	1	-	-	On the Island	18 35.8	63 27.7	<i>Proposed.</i>		
St. THOMAS.	1 F.	12	95	E. entrance, on Mohlenfels pt.	18 19.4	64 55.1			
Santa Cruz, or St. Croix Id.	1 F.	4	-	Frederichstad Fort	17 42.7	64 52.7			
"	1 F.	-	-	Christianstad Fort	17 45.4	64 41.5			
PUERTO RICO.	1 Rev. ev. 2 min.	18	171	Fort San Juan, on the Morro	18 29	66 7.1	Said to be only 8 s. bright.	8 2	1 $\frac{1}{2}$
HAITI.	1 F.	9	113	San José Fort	18 28.1	69 52.5			
"	1 F.	6 to 8	234	Balandra Head, Samana Bay	19 11.8	69 13.7			
"	1 F.	9	80	Lamentin point	18 33.6	72 25.2	<i>Red</i> light seaward.	8 0	1
JAMAICA.	1 Rev. ev. min.	15	115	Morant point	17 56	76 11.7			
"	1 F.	12	68	Plum point, 66 yards northward of the pt.	17 55.7	76 47	<i>Red</i> when bearing between N.W. by W. $\frac{3}{4}$ W. and N. $\frac{1}{4}$ E. <i>White</i> from N. $\frac{1}{4}$ E. round east to S.E.		
"	1 F. <i>Red &amp; White.</i>	-	40	Fort Augusta.	17 57	76 53	<i>White</i> to the S. and W., <i>Red</i> to the eastward. Bearing N. by E. leads through the south channel.		
<b>Island of Cuba</b>									
St. JAGO DE CUBA.	1 F. (flash ev. 2 min.)	15	226	100 yards E. of the Morro Castle	19 57.7	75 54.3			
CAIX.	1 F.	6	46	On the Cape	19 48.6	77 45.6	<i>Provisional.</i>		
NAGUA, or CIEN-FIEGOS HARB.	1 F. (flash)	14	81	Colorados, or E. pt. of entrance	22 1	80 40.3			
Cochinos Bay.	1 F.	7	30	N. part of Cay Piedras del Sur	21 57.8	81 13.3			
Batabano.	1 F.	3	31	"	22 41.4	82 18			
ISLE OF PINES.	-	-	-	On Cape Pepe	21 26	83 6	<i>Proposed.</i>		
SAN ANTONIO.	1 Revolving ev. $\frac{1}{4}$ min.	20	107	On the Cape	21 51.5	84 58.1			1 $\frac{1}{2}$
JULIAS.	-	-	-	On the Cay	22 43.3	84 6.5	<i>Proposed.</i>		
GOBERNADORA.	-	-	-	On the point	23 0	83 13.2	<i>Proposed.</i>		
HAVANA.	1 F. & Fl. ev. $\frac{1}{2}$ min.	21	144	Morro Castle, E. side of entr.	23 9.3	82 22.1	The light is extinguished for 10 m. after midnight to clean and trim the lamps.	8 14	3
Santa Cruz.	-	-	-	"	23 9	82 1.2	<i>Proposed.</i>		
GUANOS.	-	-	-	On the point	23 9	81 42	<i>Proposed.</i>		

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
CARDENAS BAY.	1 F. & Red Fl. ev. $\frac{1}{2}$ min.	15	68	Piedras (Cayo del Norte.)	23 14.4	81 7.5		H. M.	Ft.
„	1 F.	7	43	Cay Diana	23 9.9	81 7			
Cruz del Padre.	1 F.	10	49	On the Reef, $\frac{3}{4}$ mile N.E. of the Cay	23 17.1	80 54.2			
BAHIA DE CADIZ	1 F. & Fl. ev. min.	24	175	On the N.E. part of the Cay	23 12.6	80 29.3			
PAVEDON GRANDE.	1 F. & Fl. ev. min.	14 to 20	159	N. part of Cay	22 29	78 10.1			
NUEVITAS HARB.	1 F.	9	49	Barlovento, or Pilots' Point, E. entrance	21 37.5	77 5.3			
„	1 Rev. ev. min.	20	174	Maternillos Pt.	21 40.2	77 9.1			
LUCRECIA.	-	-	-	On the point	21 4.6	75 37.9	<i>Building.</i> A temporary F. light is exhibited 52 feet above H. W., visible 6 miles.		
MAVSI.	1 F.	17	128	On the Cape, E. point of Cuba	20 15.2	74 10.4			
<b>Bahama Islands.</b>									
CAY LOBOS.	1 F.	16 or 17	146	On the Cay	22 22.5	77 35.1	Visible round the horizon.	7 40	3
Anguila.	-	-	-	S.E. Cay	23 29	79 32	<i>Proposed.</i>		
CAY SAL BANK.	1 F.	8 or 10	96	N. Elbow, or Planquata Cay	23 56.5	80 28	Seen except when it bears S.W. $\frac{1}{4}$ W., being intercepted by Water Cay when 3 leagues distant.		
GUN CAY.	1 Rev. ev. $1\frac{1}{2}$ min.	12	80	Near S. point	25 34.5	79 18.8	Seen except between S. by W. $\frac{1}{4}$ W. and S. $\frac{3}{4}$ E., being intercepted by the Bemini Isles when 8 miles distant. <i>An indifferent light.</i>		
GREAT ISAAC.	1 Rev. ev. $\frac{1}{2}$ min.	16	158	On the Island	26 2	79 6.5	Shows a fixed light for a distance of 6 miles between the flashes.		
Great Stirrup Cay.	1 F.	12	81	600 yards from E. end of Cay	25 49.7	77 24	Visible from S.E. by S. to N.E., or 280°.	7 0	4
NASSAC HARB.	1 F.	10	68	W. pt. of Hog Island	25 5.6	77 22.4	Visible from N.E. round by north to N.W.	7 30	4
Athol Island.	1 F.	9	50	On Cupola of Quarantine Officer's Dwel- ling	25 5	77 17.5	Visible between N.N.W. $\frac{3}{4}$ W. and W. $\frac{1}{4}$ N.		
ABACO.	1 Rev. ev. min.	16	160	S.E. pt., or Hole in the Wall	25 51.2	77 11.2	Visible from S.W. to E.S.E. by the east.	8 9	3
„	1 F.	14	123	Little Guana, or Elbow Cay, $\frac{3}{4}$ mile inland	26 35.5	76 58.5	Illuminates an arc of 228°.		
CROOKED ISLAND PASSAGE.	1	-	-	Castle Island	22 7	74 19	<i>Building.</i>		
INAGUA, GREAT ISLAND.	1	-	-	S.W. point	20 55	73 40	<i>Building.</i>	8 0	3 $\frac{1}{2}$
TURKS ISLAND.	1 Rev. $\frac{1}{2}$ a Fl. ev. $\frac{1}{2}$ min.	15	108	Near N. ex- tremity of Id.	21 31	71 7.7	-		3

1  
Nam  
Lig

Puerto C  
BUEN A

Little C  
Island.  
Great C  
Island.  
Rio de la  
Limon, o  
Bay.

HALF-MO  
CAY.  
Bokel Ca  
Belize.

„

Turneff C

Sisal,  
Campech  
Carmen  
minos  
Laguna  
VERA CR

TAMPICO

8.	9.
H. W. at F. & C.	Rise of Springs.

## COAST OF TIERRA FIRME AND MEXICO.

H. M.	Ft.
-------	-----

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
		Miles	Feet.		N.	W.		H. M.	Ft.
Puerto Cabello. BEEN AYRE.	1 Rev. ev. 40 s. 1 F.	14 12	79 85	Brava point Laere point, S. point	10 30 12 2·2	68 0 68 22·3	Alternate flashes of <i>Red</i> and <i>White</i> .		
Little Curacao Island.	1 F.	10	40	On the S. side	11 58	68 44	Said to be a <i>Red</i> light.		
Great Curacao Island.	1 F.	-	-	St. Ann Harb., on Rif Fort	12 6·2	68 55·2			
Rio de la Hacha.	1 F.	6	69	On the Church	11 33·8	72 59·3			
Limou, or Navy Bay.	1 F.	10	60	N.W. part of Manzanilla Id. Colon, or Aspinwall	9 23·8	79 53			
HALF-MOON CAY.	1 F.	18	88	S.E. point	17 12·2	87 32·5			
Bokel Cay.	2 F.	-	-	On the Cay	17 8·3	87 56·5			
Belize.	2 F.	3	95	English Cay, S. side of Chan.	17 19·5	88 3·9			
Turneff Cays.	1 F. 3 F.	- 13	- 95	Fort George Mauger Cay, near the N.W. point	17 29·3 17 36	88 11·9 87 46	The bank extends 1½ miles to the N.E. of the lighthouse.		
Sisal.	1 F.	10	60	On the Castle	21 10	90 3			
Campeche.	1 F.	14	95	-	19 50	90 33			
Carmen Ter- minos de Laguna.	-	-	-	Indian Village, Jicalango pt.	18 38·5	91 54	<i>Building.</i> Old lighthouse burnt.	1 47	2½
VERA CRUZ.	1 Rev. ev. 45 s.	15	80	Fort of San Juan de Ulloa, W. part	19 12	96 8			2
TAMPICO BAR.	1 F.	15	-	N. point of entr.	22 16·7	97 47			

7 40	3
------	---

7 0	4
-----	---

7 30	4
------	---

8 9	3
-----	---

8 0	3½
-----	----

3
---

# SOUTH AMERICA.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visi- bility.	4. Height of Light above the Sea	5. Where placed.	6. Position.		7. REMARKS.	8. H. W at F. & C.				
					Lat.	Long.		H.	M.	Ft.		
<b>Coast of Guayana.</b>			Miles	Fect.		N.	W.		H.	M.	Ft.	
Orinoco River (Light Vessel)	1 F.	8	-	N. of Barrappt., in 18 ft. water	8 37	60 42	Sail to have been sunk in 1850; not likely to be replaced.	6	0	3		
DEMERARA	1 R. ev. min.	16 to 20	103	E. side of entr.	5 49.3	58 11.5	A Semaphore on summit of light- house.	1	45	9		
"	1 F. (Lt. Vessel)	10	-	Ship Guayana, in 3½ fathoms, N.N.E. of E. about 10 miles from the entr. of the river.	6 52.5	58 52	A large <i>Blue</i> flag by day.					
BERRIO (Lt. V.)	1 F.	10	-	Close to E. pt. of entrance	6 19.3	57 22.5	The light bearing S.S.W. in 4 fathoms is the fairway into the harbour. (1864.)	1	30	11		
Surinam (Lt. V.)	1 F. <i>Red.</i>	7	30	N.W. of Brans point, in 14 feet (1865)	6 0	55 15.8	- - - - -	6	0	5½		
Cayenne.	1 F. <i>Green.</i>	8	65	Angle of In- fantry Barracks	4 56.2	52 18.6	} Lights in one lead over Amiable Rock, which is avoided by keeping W. of this line.	3	45	6-11		
"	1 F.	10	130	Cayron Fort.	-	-						
"	1 F. <i>Red.</i>	-	-	Jetty, end of	-	-						
Enfant Perdu.	1 F.	10	60	A rock about 6 miles north of Cayenne	5 2.7	52 15.9						
SALT ISLANDS.	1 F.	18	200	Royale Islet, summit of Hospital	5 17	52 32.9	A rock of 12 feet lies N. by W. ¾ W. from the lighthouse, distant about 2078 yards.					
<b>Brazil.</b>						S.						
PARA.	1 Rev.	17	-	Atalaia point	0 34	47 17.1	- - - - -	12	0	11		
ITACOLMI.	1 Rev. ev. 1½ min for 48 sec. <i>White and Red.</i>	15	147	On the point	2 10	44 24						
Aleantara.	1 F.	-	-	On the point	-	-	A guide to the anchorage.					
Maranhão.	1 F.	10	-	San Marcos Fort, San Luiz	2 29.5	44 16		7	0	16½		
SANTA ANNA.	1 Rev. ev. 80 s.	14	70	E. part of Id.	2 16.5	43 38.4						
Ceara.	1 F.	10	37	Macoripe point	3 42	38 26.9		4	30	9		
Gonzalo River (Light Vessel)	1 F.	-	-	Off the entrance	-	-						
Rio Grande do Norte.	1 F.	12	43	Fortress of Santos Reis Magos	5 15	35 11.9						
Marca.	1 F.	-	-	On the Cape	-	-						
PERNAMBUCO.	1 Rev. ev. min.	15	-	On the Reef, 50 yards from Fort Pico	8 37	34 49.4	Twice <i>White</i> and once <i>Red</i> in succession, showing a light ev. min.	4	45	8		

LIGHTS AND TIDES.—SOUTH AMERICA.

125

8	3
H. W. at F. & C.	Rise of Springs.
H. M.	Ft.
6 0	3
1 45	9
1 30	11
6 0	5½
3 45	6-11
12 0	11
7 0	16½
4 30	9
4 45	8

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H.	M.	
MACEIO.	1 F. & Fl. ev. 2 min.	Miles 22	Feet. 208	A mile from anchorage, W. part of mountain	9 39.3	35 41.4	E. light 70 s., eclipse 16 s., flash 12 s., eclipse 22 s.	4	30	Ft. 3½
Costa Rica Bar.	1 F.	6 to 9	115	Watch Tower	11 1	36 59.5	White to S.E., Red eastward, Green southward. Vessels should anchor with the Red light in sight in 4 fathoms. With White or Green light in sight do not go into 5 fathoms.			
BAHIA.	1 Rev. ev. 80 s.	18	140	Fort San Antonio	13 0.9	38 31.7	Shows twice White and once Red, in succession.	4	15	8
MORRO DE SAN PAOLO.	1 Rev. ev. min.	20	276	On the Morro	13 2.6	38 52.2	Eclipse not total within 8 miles.			
Pajuru.	1 F.	-	-	On the point	-	-	Harbour light, of small power.			
Christovao Pereira.	1 F.	-	-	On the point	-	-	" "			
Barba Negra.	1 F.	-	-	On the Isle	-	-	" "			
Portalegre.	1 F.	-	-	-	18 30	39 30	" "			
CAPE PRIO ID.	1 Rev. ev. 1½ min.	25	522	Focinho do Cabo point	23 0.7	41 57.4	Eclipse 1.45 s. Visible from S.W. to East, or through an arc of 225°			
ABROLHOS ISLES.	1 Rev. ev. min.	17	189	Santa Barbara Island, highest point	17 57.9	38 39.1	-	3	20	6-7
RAZA.	1 Rev. ev. 2½ min. White & Red.	10 to 14	315	On the Island	23 5.7	43 8.3	-			
Rio de Janeiro.	1 F.	6	-	Fort Santa Cruz, E. side of entr.	22 56.6	43 7.3	-	3	0	4
"	1 F. Red.	-	-	Calhabouco pt.	-	-	-			
SANTOS.	1 F.	12	100	Moela Island	24 2	46 16	-			
SANTA CATHARINA.	1 Rev. ev. ¼ min.	18	149	Ponta dos Naufragados	27 49	48 42.6	-	2	45	6
Rio Grande do Sul.	1 Rev. ev. 2 min.	14	96	N. point of entr.	32 7.2	52 4.4	Bright 70 s., eclipsed 50 s.	-		1½-2
<b>Rio de la Plata</b>										
MALDONADO BAY.	1 F.	20	152	East point	34 58	54 56	-			
FLORES.	1 Rev. ev. 3 min.	12	104	On the Island	34 57	55 55.8	An indifferent light. (1865.)			
English Bank (Light Vessel.)	1 F.	8 to 10	-	On the Tail, N. part of bank, in 7 fathoms	35 6	55 54	-			
MONTE VIDEO.	1 F. & Fl. ev. 3 min.	25	486	W. side of Harbour, on the Mount	34 53.1	56 13	The Fl. of 15 s. is preceded and followed by a short eclipse.			
"	1 F.	-	147	Cathedral, S. Tower	-	-	Dial plate of clock, lighted by gas.			
Ortiz Bank (Light Vessel.)	1 F.	8 to 10	30	N.E. ¼ N., 8 miles from Indio point, in 3½ fathoms	35 11.5	57 1.2	A Black ball at foremast head. The position of this vessel is uncertain, and it is said to show a bad light. (1865.)			

## LIGHTS AND TIDES.—SOUTH AMERICA.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
Chico Bank (Light Vessel)	1 F.	Miles 8 to 10	Feet. 20.	N. E. $\frac{1}{4}$ N. from Point Atalaya, 13 miles, in 5 fathoms	34 47	57 29.2	The position of this light is not to be depended on. (1865.)	H. M.	Ft.
Colonia.	1 Rev. cv. 3 min.	10	110	S. W. angle of the Plaza	34 28.2	57 49.7			
Buenos Ayres.	1 F.	7	20	Guard Ship in 'Outer Roads, in 24 fathoms (1864.)	34 34.5	58 16		12 0	3-5
<b>Patagonia.</b> FALKLAND IDS.	1 F.	14	110	Cape Pembroke	51 40.7	57 41.8	Seen from seaward in every direction. Dark towards Ports William and Stanley.		
<b>Chile.</b> Chiloe Island, N. part.	1 F. and Fl. cv. min.	12	197	Huapilacuy pt., San Carlos de Ancud	41 46.7	73 55.7	When the light bears S. E. by E. vessels may haul to the south- ward.		
Conception Bay, Quiriquina Id. VALPARAISO.	1 1 F. & Fl. cv. min.	- 20	- 197	Talcahuano Angeles, or Playa Ancha point	36 36 33 1.2	73 6 71 41.5	<i>Proposed.</i> The Fl. is preceded and followed by a short eclipse.	9 32	5
Huasca. Caldera.	1 1	- -	- -	- -	28 28 27 3	71 19 70 56	<i>Proposed.</i> <i>Proposed.</i>		
<b>Peru.</b> CALLAO.	1 F.	12	980	Lorenzo Island, on the Cape, N. point	12 4	77 19.5	Dark from N. W. $\frac{1}{4}$ N. to W. by N. $\frac{1}{4}$ N.; just open on the latter bearing will lead through the Boqueron Channel in 4 $\frac{1}{2}$ fms.	5 47	4
<b>Ecuador.</b> GUAYAQUIL.	1 F.	-	-	Santa Clara Id., near the centre	3 10	80 26		7 0	11



8. W. at & C. Rise of Springs.

## WEST COAST OF NORTH AMERICA.

M. Ft.

0 3-5

32 5

47 4

0 11

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.			9. Rise of Springs.
					Lat.	Long.		H.	M.	Ft.	
<b>Costa Rica.</b>		Miles	Feet.		N. °	W. °		H.	M.	Ft.	
Nicoya Gulf.	1 F.	9	65	Punta Arenas	9 59.6	84 49.3					
<b>Mexico.</b>											
Acapulco.	1 F.	4 or 5	120	Grifo, or Roqueta Island	16 50.2	99 52	For mail steamers when expected.	3	6	1½	
"	1 F.	-	-	Grifo point	- -	- -					
<b>California and Oregon.</b>											
SAN DIEGO.	1 F.	25	457	Pt. Loma, on the west side of entrance	32 40.2	117 13.5		9	38	5	
Santa Barbara.	1 F.	12	180	On the point, 2 miles S. W. of landing place	34 23.6	119 42.1					
CONCEPTION.	1 Rev. ev. ¼ min.	23	250	Near the pitch of the point	34 26.8	120 20.6	Fog-bell, struck by machinery.				
MONTEREY.	1 F.	13	91	Point Pinos, S. side of the Harbour	36 37.9	121 55					
FARRALLON.	1 Rev. ev. min.	26	360	Highest peak of the largest and S. E. Islet	37 41.8	122 59.1		10	37	4½	
SAN FRANCISCO.	1 F.	24	306	Point Bonita	37 49.1	122 30.8	Fog-bell, struck by machinery.	12	6	4½	
"	1 F. & Fl.	-	-	Lobos, on the point	- -	- -	<i>Building.</i>				
"	1 F.	12	52	Fort point	37 48.5	122 27.6	Fog-bell, struck by machinery, and a Fog-horn sounded every 5 minutes.				
"	1 F.	14	166	Alcatraz Island	37 49.5	122 24.3	Fog-bell, struck by machinery.				
C. HANCOCK.	1 F.	22	230	Pitch of Cape, Columbia River	40 16.6	124 2	Fog-bell, struck by machinery.				
HUMBOLDT HARBOUR.	1 F.	12	53	N. side of entr.	40 46.1	124 12.2		12	2	5½	
Crescent City.	1 F. & Fl. ev. 1½ min.	14	80	Seaward extr. of island point, forming southern and western sides of Harbour	41 44.6	124 11.4					
UMPQUA RIVER.	1 F.	15	100	On the South Sands, at the entr. to the river.	43 40.3	124 11.1	Doubtful; believed to be discontinued. Was lighted in 1858.				
Shoalwater Bay.	1 F. (flash.)	14	85	Toke pt., north pt. of the bay	46 44.2	124 2.4					

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility. Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at E. & C.	9. Rise of Springs. Feet.
					Lat.	Long.			
					° N.	° W.			
<b>Juan de Fuca Strait.</b>								H. M.	Fe.
C. FLATTERY.	1 F.	20	162	Tatonch Island, highest point, $\frac{1}{2}$ a mile N.W. of the Cape	48 23.3	124 43.8			
New Dungeness.	1 F.	14	100	N. end of Sand Spit	48 11	123 6.1			
BLUNT ISLAND.	1 Rev. cv. $\frac{1}{2}$ mil.	15	90	Highest part	48 19.2	122 50			
Puget Sound.	1 F.	17	119	Admiralty Hd., Whidbey Id.,	48 9.4	122 40.1			
<b>British Columbia.</b>									
RACE ISLANDS.	1 Fl. cv. 10 s.	18	118	On the Rocks	48 17.7	123 32.2	S.E. by E. 3 or 4 cable's length from the lighthouse is a reef, having 5 feet only thereon.		
Esquimalt.	1 F.	10	70	Fisgard Island summit, S point	48 25.6	123 27.2	Shows <i>Green</i> when bearing between N. by E. $\frac{1}{2}$ E. and N. $\frac{1}{4}$ W., <i>White</i> from N. $\frac{1}{4}$ W. to N.W. by W. $\frac{1}{4}$ W., and <i>Red</i> towards the Harbour or from N.W. by W. $\frac{1}{4}$ W., round by west to S. $\frac{1}{4}$ E. (An arc of 220°.)		
Cape Berry.	1	-	-	Entrance Island	49 13.3	123 48.2	<i>Proposed.</i>		

8. W. at & C.  
9. Rise of Springs.

## APPENDIX.

Lights established since the work went to press, making the List complete to April 30th, 1866.

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
					Lat.	Long.			
<b>British Ids.</b>		Miles	Feet.		° N.	° W.		H. M.	
Falmouth. (Page 1)	1 F.	-	35	St. Anthony's pt. lighthouse	-	-	Visible from seaward between N.N.E. $\frac{1}{2}$ E. and N. by E. $\frac{1}{4}$ E. Only seen from 2 cables to the eastward of Manacles Pock. When in one, N.W. by N., lead through Corton Gateway.		
Corton.	2 F. <i>Red.</i>	-	87 37	Near Hopton Church	-	-	Removed 1-6-10 miles N.N.E. $\frac{1}{2}$ E. of her former position.		
Corton (Lt. V.) (Page 5)	Alteration.	-	-	-	-	-	Vessels in rounding should pass northward of her.		
Whitton Ness (Light Vessel.) (Page 6)	2 F. Upper <i>White</i> Lower <i>Red</i>	-	-	N.E. side of shoal	-	-			
North Shields. (Page 7)	1 F. <i>Red.</i>	-	-	North Pier	-	-			
Douglas, Isle of Man. (Page 13)	1 F. <i>Red.</i>	-	-	North Pier-head	-	-	<i>Temporary.</i>		
Skerries. (Page 14)	1 F. Alteration.	-	-	-	-	-	From S.S.E. to S.E. $\frac{1}{2}$ S., masked to cover the East Platters Rock. A <i>Red</i> light shown from E. $\frac{3}{4}$ S. to E. by N. $\frac{1}{2}$ N. covers the Ethel and Coal Rocks.		
Smalls. (Page 15)	1 F. Alteration.	-	-	-	-	-	Shaded <i>Red</i> from W. $\frac{1}{2}$ N. to N.W. $\frac{1}{2}$ W. to cover the Hats and Barrel Shoals.		
Swansea. (Page 15)	1 F.	-	-	Pier Extension Works	-	-	<i>Temporary.</i>		
Rathlin Island. (Page 18)	-	-	-	Altacorry Head	55 18'2"	6 10'7"	An 18-pounder Gun is fired during fogs at intervals of 20 minutes.		
Calf Rock. (Page 29)	1 Fl. ev. 15 s.	17	141	On the rock	51 34'2"	10 14'8"			
Blacksod Point. (Page 19)	1 F.	10	37	Blacksod Quay, W. side, entr. to Blacksod Bay	54 5'9"	10 3'6"	<i>White</i> when bearing from N.E. round north and west to S.W. by W. <i>Red</i> from S.W. by W. to S.W. $\frac{1}{2}$ S. Tower 41 feet high.		
Sgeir Maoile. (Page 11)	1 Rev. ev. min.	14	73	On the rock	55 52'5"	5 49'5"	Distant about 2 miles, S.E. by E. from the entrance of Lowlandman Bay, in Jura.		
<b>Baltic.</b>									
Spotsbierg. (Page 27)	Alteration.	-	-	-	-	-	This light now flashes every 15 s.		
Maseskar. (Page 28)	1 F. <i>Red.</i>	12	114	On the rock	58 5'8"	11 20' E.	Near Karringo Pilot-station. Tower 72 feet high, and colored <i>Red</i> . About 55 yards to the Eastward are three houses, two painted <i>White</i> and one <i>Red</i> .		
Colberg. (Page 31)	1 F.	6 to 8	25	East mole of Harbour	54 11'3"	15 33'6"			
Kalmar Sound. (Page 35)	2 F.	6 to 8	26	Ut Grunden	56 19'1"	16 16'1"	Moored 4-10 of a mile S.W. of the reef. A Fog-bell.		

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.		4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
		Miles	Feet.			Lat.	Long.		H.	M.	
Wormso. (Page 32)	Alteration.	-	-	-	-	-	-	This light does not now show <i>Red</i> , but is <i>White</i> from S.W. $\frac{3}{4}$ W. by south and east to N. $\frac{3}{4}$ E.	-	-	-
<b>Norway.</b> Præsto (Page 38)	-	-	-	-	-	-	-	Lighthouse burnt down.	-	-	-
<b>France.</b> Plateau des Minquiers (Lt. V.) (Page 41)	2 F.	Sor 10	26 39	Near the S.W. extremity of the bank	48 53.6	2 17.3	W.	A Fog-bell. Vessel is <i>Black</i> , with skeleton ball of same color at each mast-head.	6	6	35
Dives. (Page 44)	2 F. <i>Red</i> .	9 7	148 10	Summit of Benzeval Hill and Foot of Benzeval Hill	49 17.7	0 5.2		The towers, 195 yards apart, situate on the right bank of the River Dives. When in one, bearing N. 12° 40' W., (true) they lead into the channel of the port. Lower light will not be shown until there are 6½ feet water in the channel.	9	39	21
<b>Portugal.</b> Oporto. (Page 51)	1 F. <i>White</i> . Provisional.	8	-	In the old tower	-	-		New lighthouse to be built. Probably now building.	-	-	-
<b>Spain.</b> Palamos Bay. (Page 57)	1 F. <i>Red</i> .	10	74	Molino Pt., east side of Palamos Bay	41 50.1	3 8.5	E.		-	-	-
"	1 F.	5	33	On the Mole	-	-			-	-	-
<b>Mediterranean.</b> Port Camogli. (Page 61)	1 F. <i>Red</i> .	3	23	S. end of Mole	-	-			-	-	-
<b>West Coast of Italy.</b> Civita Vecchia. (Page 61)	-	22	-	-	-	-		This light is now visible from a distance of 22 miles.	-	-	-
Fiumicino. (Page 61)	2 F.	4 each	20	50 yards from North Mole-head, the other 28 yards from extremity of S. Jetty	-	-		Substituted for the Revolving lt.	-	-	-
Fiumara Grande, or Ostia. (Page 61)	1 F.	15	88	San Michele Tower, about 1 mile from S. point of entr. to river	41 44.5	12 15.2			-	-	-
Anzio. (Page 61)	1 Rev. ev. min.	15	90	On the Cape	41 26.7	12 37.3		The tower is round, and built on a house in the old battery called Gregoriana.	-	-	-
Port Anzio.	1 F. <i>Red</i> .	3	23	On the wall at the point of the Mole	-	-		Substituted for the lt. mentioned on page 61.	-	-	-
Mount Circello. (Page 61)	1 F.	17	124	Adjoining a house in Cervia Battery	41 13.3	13 4.1			-	-	-

LIGHTS AND TIDES.—APPENDIX.

8. I. W. at F. & C.	9. Rise of Springs.	1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility. Miles	4. Height of Light above the Sea. Feet.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.	9. Rise of Springs.
							Lat.	Long.			
I. M.	Ft.						° N.	° E.		H. M.	Ft.
		Badino.	2 F.	4	15	First near extreme of Dike, west of Portatore Canal; the other 30 yards from extremity of Dike, east of the Canal	41 17	13 9.1	Substituted for lights mentioned on page 62.		
6 6	35	Milazzo. (Page 64)	Alteration.	-	-	-	-	-	Light removed to the distance of 121 ft. from the extremity of the jetty.		
9 39	21	St. Cataldo. (Page 64)	1 F.	6 or 7	56	Entrance of the port	40 23.4	18 19			
		Cape Katakolo. (Page 67)	1 Rev. ev. 2 min.	17	149	South point of Peninsula, forming Katakolo Bay	37 38	21 18.8	A faint light will be seen for 1½ min. followed by a total eclipse for 10½ s., a <i>bright</i> flash for 9 s., and a total eclipse for 10½ s.		
		Tripoli. (Page 73)	Alteration.	10	-	Ramkine Islet	-	-	The <i>Red</i> light has been changed to <i>White</i> . The <i>Red</i> light in the Citadel of Tripoli has been extinguished.		
		<b>Indian Ocean.</b> Double Island. (Page 83)	1 F.	19	-	On the Island.	15 52.5	97 36.5	Visible when bearing from about N. ¾ W. round by east to S. S. E.; the former bearing passes ¼ mile westward of Kalegouk Island, and the latter 1¼ miles westward of the Patch Buoy, off Amherst. A strip of light shows from the Patch Buoy eastward as far as Amherst Point.		
		Chittagong. (Page 82)	2 Lts. F. (Vertical.)	8 7	38 30	Norman Point	22 11.1	91 52	When 3 miles from the light, anchor and wait for a pilot. Geographical position uncertain.	1 15	15
		<b>New Caledonia.</b> Port of France. (Page 90)	1 F.	20	164	Amedee Islet	22 28.7	166 27.5	Serves as a mark for the entrance to the Bulari Passages, southward of the Port. The light is seen round the horizon, but a vessel should be careful to approach it, between the bearings of N. by E. and E. N. E.	8 25	4
		<b>United States.</b> Shovelful Shoal (Light Vessel). (Page 103)	Alteration.	-	-	Moored in 20 fms., about ¼ mile from the breakers of the shoal	-	-	Removed 1¼ miles from her former position. Monomoy lighthouse bears N. by E. Shovelful Spar Buoy W. N. W., and Handkerchief Lt. V. S. W. by W.		
		<b>West Coast of N. America.</b> Fraser River. (Page 128)	1 F. (Light V.)	11	-	Sand Heads	N. 49 3.5	W. 123 17.3	Moored in 10 fathoms.	6 30	7 to 10

## LONGITUDES FROM GREENWICH.

*These positions are either well determined Meridians, or so nearly well determined, that they may in the future require but a very small correction: hence the majority of them may be used as the basis of observations in carrying out meridian distances.*

*The Longitudes in this work are referred to these meridians.*

	°	'	"		°	'	"		
San Fernando, Cadiz ( <i>Observatory</i> ) N.A. . . . .	6	12	16.5	W.	Paris ( <i>Observatory</i> ) N.A. . . . .	2	20	9.5	E.
Corunna ( <i>Fort Antonio</i> ) C.T. . . . .	8	22	41		Amsterdam ( <i>West Steeple</i> ) C.T. . . . .	4	53	3	
Lisbon ( <i>Observatory</i> ) C.T. . . . .	9	8	36		Brussels ( <i>Observatory</i> ) N.A. . . . .	4	22	13.5	
Pernambuco ( <i>Fort Picao</i> ) . . . . .	34	49	28		Altona ( <i>Observatory</i> ) N.A. . . . .	9	56	32	
Rio Janeiro ( <i>Fort Villegagnon</i> ) . . . . .	43	6	51		Copenhagen ( <i>University</i> ) N.A. . . . .	12	34	57	
Monte Video ( <i>Custom House</i> ) . . . . .	56	10	4		Berlin ( <i>Observatory</i> ) N.A. . . . .	13	23	52.5	
Barbados ( <i>Fort Beckwith</i> ) . . . . .	59	36	45.6		Naples ( <i>Capo di Monte</i> ) N.A. . . . .	14	14	42.9	
Martinique ( <i>Fort St. Louis</i> ) . . . . .	61	4	15		Upsala ( <i>New University</i> ) N.A. . . . .	17	37	30	
Trinidad ( <i>Half-Moon Fort</i> ) . . . . .	61	30	36		Stockholm ( <i>Observatory</i> ) N.A. . . . .	18	3'	42	
Antigua ( <i>Fort James</i> ) . . . . .	61	51	21		Cape of Good Hope ( <i>Observatory</i> ) . . . . .	18	28	42	
St. Christopher ( <i>Basseterre Church</i> ) . . . . .	62	42	55		Abo ( <i>Old Observatory</i> ) C.T. (1862) . . . . .	22	16'	54	
St. Bartholomew ( <i>Fort Oscar</i> ) . . . . .	62	51	6		Helsingfors ( <i>Observatory</i> ) N.A. . . . .	24	57	43.5	
Halifax ( <i>Dockyard Observatory</i> ) . . . . .	63	35	15		Petersburg ( <i>Academy of Sciences</i> ) N.A. . . . .	30	18	22.5	
Santa Cruz ( <i>Lang's Observatory</i> ) . . . . .	64	41	0		Nicoleff ( <i>Observatory</i> ) N.A. . . . .	31	58	46.5	
St. Thomas ( <i>Fort Christian</i> ) . . . . .	64	55	40		Arkhangel ( <i>Trinity</i> ) C.T. (1862) . . . . .	40	33	41	
Santiago de Chilé ( <i>Observatory</i> ) N.A. . . . .	70	38	14.5		St. Denis, Reunion ( <i>Government Ho.</i> ) C.T. . . . .	55	30	1	
Cambridge, Massachusetts, U.S. ( <i>Observatory</i> ) . . . . .	71	7	22.5		Mahé, Seychelles . . . . .	55	30	9	
Quebec ( <i>Observatory in Citadel</i> ) . . . . .	71	12	15		Port Louis, Mauritius ( <i>Observatory</i> ) . . . . .	57	29	30	
Valparaiso* ( <i>Fort San Antonio</i> ) C.T. . . . .	71	37	13		Bombay ( <i>Observatory</i> ) . . . . .	72	48	4	
Washington, U.S. ( <i>Observatory</i> ) N.A. . . . .	77	3	0		Madras ( <i>Observatory</i> ) N.A. . . . .	80	14	19	
Panama ( <i>Cathedral</i> ) C.T. . . . .	79	30	13		Calcutta ( <i>Fort William Flagstaff</i> ) . . . . .	88	19	40	
Charleston, U.S. ( <i>Gibbes Observatory</i> ) . . . . .	79	56	0		Penang ( <i>Fort Cornwallis</i> ) . . . . .	100	20	10	
Cape Florida ( <i>Astronomical Station, U.S. Co. Survey</i> ) . . . . .	80	9	24		Singapore ( <i>Fort Fullerton</i> ) . . . . .	103	51	18	
Savannah ( <i>Exchange</i> ) . . . . .	81	5	16.8		Saigon ( <i>Observatory</i> ) C.T. . . . .	106	41	52	
Fernandina ( <i>Astronomical Station, U.S. Co. Survey</i> ) . . . . .	81	27	42.8		Batavia ( <i>Observatory</i> ) . . . . .	106	48	7	
Sand Key, Florida, U.S. Co. Sur. . . . .	81	52	43		Hong Kong ( <i>Wellington Battery</i> ) . . . . .	114	9	14	
Havana ( <i>Moro Lighthouse</i> ) . . . . .	82	22	4		Swan River, ( <i>Scott's Jetty</i> ) . . . . .	115	45	30	
Cedar Key, Florida ( <i>Duport Key</i> ) U.S. Co. Sur. . . . .	83	2	45		Manila ( <i>Cathedral</i> ) . . . . .	120	57	22	
St. Mark's, Louisiana, U.S. Co. Sur. . . . .	84	12	30		Melbourne ( <i>New Observatory</i> ) N.A. . . . .	141	58	42	
Mobile Bay ( <i>Fort Morgan</i> ) U.S. Co. Sur. . . . .	88	0	25		Sydney ( <i>Observatory</i> ) N.A. . . . .	151	14	57	
San Francisco ( <i>Presidio Observatory</i> ) U.S. Co. Sur. . . . .	122	26	15		New Caledonia, Port de France ( <i>Fort Flagstaff</i> ) C.T. (1866) . . . . .	166	27	2	
Lummi Island ( <i>Astronomical Station</i> ) U.S. Co. Sur. . . . .	122	40	36		New Caledonia, ( <i>Kuik, or Isle of Pines, summit</i> ) C.T. (1866) . . . . .	167	28	10	
Point Hudson ( <i>Astronomical Station</i> ) U.S. Co. Sur. . . . .	122	44	33						
Tahiti, Point Venus, Pacific Ocean C.T. . . . .	149	29	10						

N.A. stands for Nautical Almanac, 1867; C.T. for *Commissaire des Temps*, 1867; U.S. Co. Sur. for United States Coast Survey.

\* This is the determination of Don Carlos Moesta, Director of the National Observatory at Santiago de Chilé, deduced by means of Electric Telegraph from that Observatory. It differs only 47" from the Longitude 71° 38' adopted in the Admiralty Charts, and upon which all the Longitudes of places on the West Coast of South America depend. The Longitude of the Observatory at Santiago is the result of 70 observations by moon culminating stars made at the end of 1852 with the great meridian circle. If the Longitude of this Observatory be correct, meridian distances measured by chronometers from Valparaiso to Rio Janeiro place the Observatory in the latter city in Long. 43° 3' 39", and consequently Fort Villegagnon in Long. 43° 2' 49". Al. Monchez has adopted, after a great number of observations, 18° 6' 51" as the Longitude of Fort Villegagnon, and has employed this as the meridian for his survey of the Coast of Brazil, now in progress. See an interesting note on this subject in the *Commissaire des Temps*, 1867.

*Table*

LIGHTS AND TIDES.—

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.	4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs.
					Lat.	Long.		H. M.	Ft.	
<i>Telegraph Hill</i>	<i>1 Light</i>	Miles	Feet.		°	'	<i>Bearing from Natchez North by E 33 miles Lose up every 15 minute</i>			

but a very  
nces.  
"  
9.5 E.  
3  
13.5  
32  
57  
52.5  
42.9  
30  
42  
42  
54  
43.5  
22.5  
46.5  
41  
1  
9  
30  
4  
19  
40  
10  
18  
52  
7  
14  
30  
22  
42  
57  
2  
10

duced by  
ed in the  
d. The  
the end  
sured by  
and con-  
ervations.  
Coast of

## LIGHTS AND TIDES.—

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.		4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at F. & C.		9. Rise of Springs. Ft.
		Miles	Feet.			Lat.	Long.		H.	M.	
						°	'				





## LIGHTS AND TIDES.—

1. Name of Light.	2. No. of Lights, Character, &c.	3. Visibility.		4. Height of Light above the Sea.	5. Where placed.	6. Position.		7. REMARKS.	8. H. W. at E. & C.		9. Rise of Springs.
		Miles	Feet.			Lat.	Long.		H.	M.	

AABENK.  
 Aalbek,  
 Aalesund  
 Aarhus.  
 Aaro, 28  
 Abaco, 1  
 .. L  
 Abbe's St  
 Aberdeer  
 Abetyrae  
 Aberystv  
 Abrolhos  
 Abscom  
 Acapulco  
 Achaide  
 Aden, lig  
 Aejgiol  
 Admiralt  
 Adour ris  
 Adra poi  
 .Ereskjoi  
 Agde, 57  
 Ag leas.  
 Agerso.  
 Agger ch  
 Aghes St  
 Agou L,  
 Aguilas,  
 Agullus  
 Ahore, ad  
 Agues M  
 Aguilon  
 Ailly cap  
 Air point  
 horizon  
 Ait dor,  
 Aizer, 4  
 Ajaccio,  
 Akka, 7  
 Albert, 2  
 Alcantar  
 Alcatras  
 Alderney  
 Aleganz  
 Alexand  
 Alxand  
 Alxand  
 Alxand  
 Algecira

# INDEX

TO THE

## LIGHTHOUSES AND LIGHT-VESSELS.

N.B.—The words in italics (as *White*, *Red*, &c.) indicate the colour of the Lighthouse or Light-vessel.

- AMENRAA, 28  
 Aalbek, 27  
 Aalesunds, 38  
 Aarhus, 28  
 Aaro, 28  
 Abaco, Hole in the Wall, *Red* and *White*, 122  
 .. Little Guana Cay, *Circular stone*, 122  
 Abi's St., head, *White*, 8  
 Aberdeen (Shore lights), *White*, 9  
 Abayrac'h, 40  
 Aberystwith, 15  
 Abrolhos island, 125  
 Abscom, brick, 109  
 Acapulco, 127  
 Adelaide, Australia, 86  
 Adea light vessel, *Red*, 79  
 Adjigol light vessel, 71  
 Admiralty head, *White*, 125  
 Adour river, 49  
 Adra point, 54  
 Adreskjobing, 28  
 Agde, 57  
 Aglenas, 38  
 Agerso, 29  
 Agger chan, light vessel, 26  
 Agnes St. (Scilly), *White*, 1  
 Agon I., Hudikswall, 35  
 Aguilas, port, 54  
 Agulha cape, *Red* and *White* bands, 78  
 Ahoreados islet, 55  
 Aiguas Mortas, 58  
 Aguilon point, 48  
 Ailly cape, 14  
 Air point, R. Dec, *Red* and *White* in bands,  
 horizontally, 14  
 Aitodor, cape, 72  
 Aizer, 43  
 Ajaccio, gulf, 59  
 Akka, 73  
 Albert, Australia, *White*, 58  
 Alcantara point, 124  
 Alcatraz island, San Francisco, *White*, 127  
 Algerney, 2, 12  
 Alegranza island, 76  
 Alexandria, 73  
 Alexandria, 74  
 Altaques de Tortosa, 56  
 Algeciras, 52  
 Alfonso, Philippines, 84  
 Algier, 75  
 Algoa bay, 78  
 Alguada reef, 82  
 Alicante, 55  
 Alipey, *White*, 59  
 Alistro, 59  
 Al Khuzemas, 75  
 Al Khelb rocks, 74  
 Al Kalah, 74  
 Almeria, iron, *Green*, 54  
 Alpreck point, 45  
 Als, 28  
 Altea, 55  
 Altaoerry head, Rathlin island, 18  
 Amastra, 7  
 Amelia island, *White*, 116  
 .. (North Beacons, *White* and  
*Red*), 116  
 Amherst point, Maulmain river, 83  
 .. fort, St. John's, 92  
 Anlweh port, 14  
 Amour point, *White*, 92  
 Amur river, *White*, 86  
 Anatolia point, Black sea, 70  
 Ancona, 65  
 Andenas, *Red*, tower, 39  
 Andrea St., island, 64  
 Andrew, port St., *White*, 98  
 Andrew's St. (pier, *Black* with *White* top), 8  
 Andros island, 67  
 Angelo, San, 62  
 Anguila, 122  
 Anns, St., point, Milford haven, *White*, 17  
 Ann, cape, U.S., *Grey*, stone, 101  
 Anna, Saata, *White*, 124  
 Anheit island, 27  
 Annan river, 12  
 Annisquam, Wigwam point, *White*, 101  
 Anjer (Java), *Stone*, 83  
 Annapolis, stripes, vertically, 98  
 Anthony, St., point, Falmouth, *White*, 1  
 Antibes, 59  
 Antonio, San, cape (Cuba), *Rose* painted on  
 it, 121  
 .. (Spain), 55  
 Anstruther, 8  
 Anticosti island, 93  
 Antigua, 121  
 Antivari, cape, 66  
 Anzio, 61 and 139  
 Apenrade, 28  
 Apple river, cape Capstan, *White*, 98  
 Arendal, Sandvig-odder entrance, 36  
 Arcachon basin, 49  
 Aransas pass, *Brown*, 119  
 Arbroath, *Grey*, stone, 9  
 Ardnamurehan, stone, 11  
 Arichat harbour, *White*, 97  
 Ardrossan pier, *White*, 12  
 Arkona, *White*, stone tower, in three stories,  
 31  
 Arklow light vessel, 17  
 Arnegon shoal, 81  
 Arosa island, 51  
 Arannmore island, *White*, 19  
 Aracan river, 82  
 Ardriahaig, 11  
 Ardglass, 18  
 Argostoli, 66  
 Arzew, 75  
 Asinara island and gulf, 60  
 Assateague island, *White*, 110  
 Assens, 28  
 Athens, 67  
 Athol island, 122  
 Aucanada, Majorca, 56  
 Auckland, 90  
 Audierne, port, 46  
 Augusta, Sicily, 63  
 .. fort, Jamaica, 121  
 Augustine, St., U.S., *White*, 116  
 Auskerry, Orkneys, 19  
 Aveiro, 51  
 Aviles, 59  
 Avatchka gulf, 86  
 Avlona bay, 66  
 Avon river, *White*, 16  
 Ayr, Scotland, 12  
 Ayre island, Minorca, 56  
 Ayre point (Main), 13  
 Azores, 76  
 Baago island, 28  
 Baba, cape, 68

- Babouslikin point, 86  
 Baccalieu island, brick, 92  
 Baek river, 111  
 Baccaro point, Nova Scotia, *White*, with a *Black* ball, 97  
 Bad'no, 62 and 131  
 Balauna bank (Man), light vessel, *Red*, 13  
 Bahia de Cadiz Cay, Cuba, *White*, 122  
 Bahia, or S. Salvador, *White*, 125  
 Baia, 62  
 Bailey, Dublin Bay, *White*, 17  
 Baker's island, Mt. Desert island, *White*, 99  
 " " Salem, U.S., *White*, 101  
 Balandra head, Hait', 121  
 Baléines, 48  
 Baly strait, 83  
 Ballbriggan, 17  
 Baleares islands, 55  
 Bald head (cape Fear), *White*, 111  
 Ballyeottin, *Red* projecting gallery, and up to the bottom of lantern sash, 17  
 Bantl, 9  
 Banka strait, 84  
 Bantry bay, Roanarrig island, *White* with *Red* belt, 20  
 Banjoewangie, Java, 83  
 Baranec, Pensacola (beacons, *White*), 117  
 Barbados, S. point, *Red* and *White* bands, 11  
 " Carlisle bay, 120  
 Barba Negra, 125  
 Barcelona, 57  
 Banche, plateau de la, 47  
 Barbara, Santa, *Grey*, 127  
 Bardsey island, *White*, square tower, 15  
 Barleur cape, 42  
 Barges d'Olonne, 48  
 Bari, 65  
 Barletta, 65  
 Barquero, 51  
 Barneget shoals, *White* and *Red*, 109  
 Barnstable, U.S., Sandy Neck, *White*, 102  
 Barra head, stone, 11  
 Barrataria bay, *White*, 118  
 Bartlett's reef, light vessel, *Black*, *White* streak, 105  
 Basin of Mites, 98  
 Bassas reef, 51  
 Bassania, 65  
 Bass Harbour head, *White*, 99  
 " river, *White*, 102  
 " strait, 87  
 Bastia, 59  
 Basto island, 26  
 Batambou, Cuba, 121  
 Batavia, 83  
 Bath, South Beveland, 23  
 Batoum bay, 72  
 Battery beacon, Charleston, U.S., iron shaft, *Bronzed*, 115  
 Bay, Savannah, iron shaft, *Bronzed*, 115  
 Bayona, or Cies island, 51  
 Bayou St. John, *White*, 118  
 Beach point, P'nblico, *White*, 97  
 Beachy head, *White*, 3  
 Bear island, Maine, *Red*, 99  
 Bearn cape, 57  
 Beaver tail, granite, 191  
 " islands, *White*, with two *Black* balls, 97  
 Beaumais, 11  
 Bee du Raz, 46  
 Belleme bay, 96  
 Bees St., head, *White*, 13  
 Beever, river Shannon, 20  
 Beirut cape, 73  
 Bel-Air point, Réunion, 78  
 Belom, 52  
 Bell rock, *White*, 8  
 Belfast bay, 18  
 Belize, 123  
 Bellavista cape, Sardinia, 60  
 Belle Chasse, 91  
 " Ile, 47  
 " Isl., Labrador, *White*, 92  
 Bender Erekli, 72  
 Benghazi, 74  
 Bequet port, 42  
 Bengut cape, 74  
 Berbice harbour, 124  
 Berdiansk, 72  
 Berdoun island, 67  
 Berezan, 71  
 Bergen, Norway, 58  
 Ber... point, U.S., *Brown*, 108  
 Ber... 51  
 Bermudas, Gibbs' hill, *White*, 76  
 Berry cape, 128  
 Berville, 43  
 Bewick stone, 7  
 Bessin, port en, 43  
 " beach point, 66  
 " Jarritz, 49  
 Bie... island, *Grey*, stone, 93  
 Bie... 73  
 Bideford harbour, *White* (high light), 16  
 Bidston, stone, 14  
 Big Fish island, Tusket river, *White*, 97  
 Bilbao, 50  
 Billingsgate island, Wellfleet, U.S., *Red*, 102  
 Biloxi, *White*, 117  
 Binic port, 41  
 Björnhabben, Oland, *White*, 35  
 Bjorn rock, octagon, *Red* and *White* above balcony, 35  
 Bird islands, Algoa bay, pyramidal, *White* with a *Black* belt in centre, 78  
 " island, Sippican, U.S., *White*, 104  
 " island, Breton island, 96  
 " rocks, Magdalen island, 93  
 Bishop rock, stone tower, 1  
 " South, *White*, 15  
 Bishop and Clerks shoal, *Grey*, 103  
 Biuro, 34  
 Bjorneberg, 34  
 Blackwater light vessel, 17  
 Black rock, Ireland, *Dark* stone, 19  
 " harbour, U.S., 106  
 " point, *White*, 98  
 Blackstone island, *White*, 112  
 Blacksoil point, square, *Reddish Grey*, 119 & 120  
 Blaize St., cape, 78  
 Blanco cape, Iviza island, 55  
 " Majorca, 56  
 Blanche point, Hyeres, 53  
 Blankenberg, 21  
 Blas St., cape, *White*, 117  
 Blaye, port de, 49  
 Block island, *White*, 105  
 Blunt island, *White*, 128  
 Plyth, *White*, 7  
 Boar's head, bay of Fundy, *White* dwelling-house, 93  
 Boca Enguato harbour, 81  
 Bodies island, *White*, 112  
 Bogense, 25  
 Bogue, banks, brick, 113  
 Bogwa, G. of Cambay, 79  
 Bojuru, 125  
 Bokel Cay, 123  
 Bolivar, point, *White*, 119  
 Bombay, 80  
 Bombay Hook, *White*, 109  
 Bonah, 74  
 Bonan, 35  
 Bonanza, 52  
 Bonavista cape, *Red* and *White*, vertically, 92  
 Bon Fouca, *White*, 118  
 Bonifacio strait, 59  
 Bonita point, *White*, 127  
 Boon island, *Grey*, 101  
 Borda cape, 86  
 Borkum island, 25  
 Bornholm, 31  
 Borselen, 23  
 Bösch, 25  
 Bosphorus, 70  
 Boston, U.S., the Narve vs; *Brown*, screw pile, 102  
 Botafoch island, 55  
 Botté, 27  
 Bouac cape, 74  
 Boue, 58  
 Bougie, 74  
 Boulogne, 45  
 Bourzi, tower, 67  
 Bovali Kalessi, Dardanelles, 69  
 Bowler rock light vessel, *Lead*, 112  
 Bowling bay, 12  
 Boztepeh point, Sinoub, 72  
 Brimö island, *Yellow* tower, 34  
 Bran sand; high, *Black* and *White*; low, *Red* and *White*, 7  
 Brandy pots, brick, *Drab*, 93  
 Brandywine shoal, *Red*, screw pile, 109  
 Brant point, Nantucket, *Red*, 103  
 " island shoal, *White*, screw pile, 113  
 Braye harbour, Alderney, 2  
 Brazo Santiago, 119  
 Br. hat isle, 11  
 Bremen light vessel, 25  
 Bremerhaven, 25  
 Brenton's reef, light vessel, *Straw*, 104  
 Brest, 46  
 Bressay, Shetlands, brick, *White*, 10  
 Breton island, Nova Scotia, 96  
 " port, 48  
 Brewster island, Boston, U.S., *White*, 102  
 " narrows, *Brown*, 102  
 Bridgewater, 13  
 " cape, 87  
 Bridgeport, U.S., *White*, 106  
 Bridlington, 6  
 Brielle harbour, 22  
 Brighton, 3  
 Brindisi, 64  
 Bristol ferry, *White*, 105  
 Brixhau, 2  
 Broadhaven, Guldgashel point, *Stone*  
 Brockways reach, *White*, 10  
 Bromfield, Glasgow, 12  
 Brouwers haven, gat, 21  
 Brown's head, *White*, 109  
 Bruny cape, *White*, 89  
 Bruster Ort, octagonal *Red*, 11



- Copeland island, Belfast, *White*, 18  
 Copenhagen, 30  
 Coquet, *White* (castellated), 7  
 Corbeaux, 48  
 Cork harbour, 16  
 Cordouan, 49  
 Corfu island, 66  
 Cork lightvessel, Harwich, *Red*, 5  
 Corner Stake, Hudson river, 108  
 Cornfield point light vessel, *Red*, 106  
 Corran point, *White*, 11  
 Corregidor island, 84  
 Correnti island, 63  
 Corrobedo cape, 51  
 Corton lights, timber frame, 129  
 .. lightvessel, *Red*, 5 and 129  
 Corunna, 51  
 Corso cape, 59  
 Corsewall, *White*, 12  
 Cottingiba, 125  
 Coubre point, 48  
 Counta, 80  
 Courseulles, 43  
 Courval, 43  
 Cow Island, Hudson river, *White*, 109  
 Cove point, Chesapeake bay, *White*, 111  
 Covesea Skerries, stone, 9  
 Coweolly, 82  
 Coxsackie, Hudson river, *White*, 108  
 Craig, port on, 8  
 Crane island, 94  
 Craney island shoal, *White*, screw pile foundation, 110  
 Crescent city, stone, 127  
 Creux, cape, 57  
 Cruz del Padre Cay, Cuba, *White*, 122  
 Crimon Java islands, 83  
 Chinan canal, 11  
 Cratun, screw pile foundation, 113  
 Croce Santa, cape, Messina, 63  
 Croisic port, 47  
 Crotay, 45  
 Cronarty point, stone, 9  
 Cromer, *White*, 6  
 Crooked Island Passage, 122  
 Crosby lighthouse, 14  
 .. light vessel, *Red*, 14  
 Cross Ripht. vessel, *Straw*, with *Red* lantern, 103  
 Cross Ledge light vessel, Delaware, *Stone*, 119  
 Cruz, Santa, West Indies, 21  
 .. Santa, port (Tenerife), 7  
 .. Cuba, 121  
 Crookhaven, 17, 29  
 Croix cape, Cuba, 121  
 Cruz del Padre, 122  
 Cuba Jago de, 21  
 Cudillero, 59  
 Cullera cape, 55  
 Cumbrae, *White*, 11  
 Cattybank, *White*, 104  
 Cuxhaven, 25  
 Cyprus island, 7
- D. Aizer, 43  
 Dardanelus shoal, iron work, *Red*, 79  
 Dagebali, 26  
 Dager Out, stone, *White*, 12  
 Dahi, 86  
 Dairyville port, *Red* and *White*, 89  
 Dame's point, light vessel, St. John's river, Florida, 116  
 Damietta mouth, R. Nile, 74  
 Danube river, 71  
 Danzig, Neufahrwasser tower, great round tower, 31  
 Danö Gamlen, 34  
 Dardanelles, 69  
 Dars point, stone tower, *Red*, 31  
 Dartmouth, 1  
 Dartuch, cape, 56  
 Davaur island, stone, 11  
 Deal island, *Red* and *White*, 88  
 Deep Water shoals, James river, *White*, screw pile, 110  
 Deer island thoroughfare, Mark island, *White*, 100  
 Delaware breakwater, *White*, 109  
 Delgada point, Alegranza island, 76  
 Delizyl, 25  
 Delle Mele cape, 60  
 Dells point, 74  
 Denerara, East point, *Red* and *White*, 124  
 Denison fort, port Jackson, 89  
 Dennis St., Réunion, 78  
 D'Entrecasteaux channel, *White*, 89  
 Derby haven, Man, 13  
 Derna, 74  
 Devil island, Halifax, *Dull Red*, with *White* belt, 97  
 Devil's wharf, *White*, 106  
 Dhardar river, 79  
 Dice's head, *White*, 100  
 Diego, San (California), 128  
 Dielette, 41  
 Dieppe, 41  
 Digby, or Amapolis, 98  
 Dil Burnu, 79  
 Dirsden, *White*, octagonal, 35  
 Dice, 130  
 Divy, *White*, 81  
 Djamel cape, Algeria, 75  
 Djama Ghazaouat, 75  
 Dniester river, 71  
 Dodding head, Burin island, circular, 92  
 Dog island, *White*, 117  
 .. Foveaux strait, stone, *Grey*, 90  
 Dome Ness, lower part *White*, upper part *Red*, 32  
 Dominica, 120  
 Donaghadee, 18  
 Doncella, 54  
 Donsche Kil, 23  
 Domanez bay, 46  
 Double isle, 83 and 131  
 Douclan port, 46  
 Douglas head, Man, *White*, 13 and 129  
 .. pier, *Buff* and *White*, 13  
 Dover, 3  
 Dovercourt, Harwich, 5  
 Dragoneer islet, 55  
 Drogheda, 18  
 Dragon, or Drogden, light vessel, 30  
 Drepun, cape, 69  
 Dry T. sugar, brick, 116  
 Dry oak (Cabin patches), Florida reef, iron frame building, 115  
 Dry Cay, 17  
 Dryden, light vessel, *Red*, 6  
 Dumphing, north, *White*, 105  
 Dumpling rocks, *White*, 104  
 Dundee, 18  
 Dundry bay, St. John's point, *White*, 18  
 Dungarvan, 17  
 Dungeness, *Red* and *White* bands, horizontally, 3  
 Dunkerque, 45, 46  
 Dunnet head, stone, 10  
 Dunbar, 8  
 Dundee, 8  
 Durazzo, 66  
 Dusterbrook, 29  
 Dutch island, *White*, 105  
 Eagle island point, *White*, 160  
 .. rock, Ireland, *White*, 19  
 Eastbourne, 3  
 Eaton's neck, *White*, 106  
 Ebro river, 56  
 Eckenförde, 28  
 Eddystone, *Red* and *White* horizontally, 1  
 Edam (Java), 83  
 Edgartown, *White*, 103  
 Edgemoggin, Green island, *White*, 99  
 Eel Grass, light vessel, lead, 105  
 Eeragh island, Ireland, two *Red* belts, horizontally, 19  
 Egerö (W. point of), *Red*, *White* belt, 37  
 Egg island, Nova Scotia, 97  
 .. Delaware bay, *White*, 109  
 Egg rock, Nahant, U.S., *White*, 102  
 Eggregrund, 35  
 Egina, 67  
 Egmont-aun-zee, 22  
 Egmont key, Tampa bay, U.S., *White*, 116  
 Ejerland Sche-gronden, 22  
 Ekholm, stone, *Red*, 33  
 Elagin Yelaguin, light vessel, 33  
 Elgin, 9  
 Elba island, 61  
 Elbe river, 25  
 Elbow (beacon, *White*), Hudson river, 108  
 El Cabanal, 55  
 Eleos island, 68  
 Elias St., cape, 60  
 Elizabeth cape, U.S., *White*, 100  
 Elizabeth, S. Africa, *Stone*, 78  
 Ellen, port, 11  
 Elm Tree (beacon, *White*), 108  
 Ems river, 25  
 Enfant Perdu rock, 124  
 English bank, light vessel, 125  
 English and Welsh grounds, light vessel, *Red*, 16  
 Enragé, cape, *White*, 98  
 Enskar island, *White*, 34  
 Entinas point, 54  
 Ereole, 61  
 Erskli point, 70  
 Eseeunee point, *White*, 95  
 Esopus meadows, Hudson river, *White*, 108  
 Esquimalt, *White*, 128  
 Espevar, 37  
 Espichel, cape, 52  
 Estaca point, 51  
 Estacio, 55  
 Etaples or Canche river, 45  
 Etel river, 47  
 Eunostos point, Alexandria, 74  
 Eupatoria point, 71  
 Europa point, Gibraltar, 52  
 Eye I., point, 47  
 Execution rocks, U.S., *White*, 106  
 Eyemouth, 7

ite bands, horizon-

100  
19

horizontally, 1

White, 99  
1, 105  
two Red belts, hori-

White belt, 37

White, 109  
White, 102

U.S., White, 116

33

Hudson river, 108

100  
78

108

125  
lands, light vessel,

5  
river, White, 108

74

2

ite, 106

Farder, Red and White belt, 36  
Fairy, port (Australia), stone, Red, 87  
Falkenberg, White, 29  
Falaise, 48  
Faleon cape, Algeria, 75  
Falkland islands (Cape Pembroke), 126  
Falmouth, St. Anthony point, White, 1 & 129  
False point, granite, White star in centre, 82  
Falsterbo, 30  
Fanaud point, Lough Swilly, White, 13  
Fanaur cape, 72  
Fangal port, 56  
Fano, 65  
Faru, White (lower, octagonal), 7  
Farnar bay, 70  
Farrallon, brick, 127  
Faro, Sicily, 63  
Farres point, Lough Larnie, 18  
Faro island, Gettland, White, 35  
Fastnet, a Red belt in the middle, 16  
Father point, White, 93  
Fatouville, 43  
Faulkner island, White, 106  
Favianana island, 63  
Fear cape (Bald head), U.S., White, 114  
" river, cape, 114  
Fecamp, 14  
Federal point, White, 114  
Fenersund, 29  
Feisteen (Lille), 37  
Fenwick island, White, 109  
Ferro point, Sicily, 63  
" cape, Sardinia, 69  
Ferrol, 51  
Ferryland, cape, 92  
Fidonisi, 71  
Fiedo, 37  
Fig island (beacon, White), Savannah river, 115  
Filsand island, stone, White, 32  
Filtvedt, 36  
Finisterre, cape, 51  
Fino port, 61  
Fire island, Yellow, 107  
Fisherrow, 8  
Fishing battery, Red, 112  
Fiumara Grande, 130  
Fiume, 66  
Fiumicino, 61 and 130  
Five Hook island, Hudson river, White, 108  
Five Fathom light vessel, Strait, 109  
Flamborough head, White, 6  
Flatholm, White, 16  
Fladholmen, 37  
Flat island, Mauritius, 78  
Flat point, Sydney, Red and White, vertically, 96  
Flattery cape, White, 128  
Fleetwood, 13  
Flint island, 95  
Flores, White, 125  
Florida cape, White, 115  
Flotte, port de la, 48  
Flusshin, 21  
Fly, or Green island, 99  
Fog point, White, 111  
Fohr island, 26  
Folgeren, 27  
Folkestone, 3  
Fontana cape, 71  
Fornby, light vessel, Red, 14  
Formentera island, 55

Formento cape, Majore, 56  
Formiche, E. island, 63  
Fortress, White, 27  
Fort point, Penobscot river, White, 100  
" " S. Carolina, White, 114  
" " San Francisco, White, 127  
Fortune bay, 93  
Four (Le), 47  
Four Mile point, Hudson river, White, 108  
Fourchu cape, Red and White, vertically, 98  
Fourth point, Sunda Strait, Stone, 83  
Foyle, Lough, 18  
France de, port (New Caledonia), iron, White, 99 and 131  
Francisco, San (California), 127  
Franklin island, U.S., White, 160  
Fraser river, British Columbia, 131  
Fraserburgh, 9  
Frederic Hendric, light-vessel, 84  
Fredericia, 20  
Frederikshavn, 27  
Frederiksvaern, 36  
Frehel cape, 41  
Friedrichsort, 28  
Frio cape, 125  
Frying Pan Shoals, light vessel, Yellow, 114  
Fuertarrabia, 49  
Fuente cape, 62  
Fulehuk, White, 36

Gaabenoe, 29  
Gabo island, granite, grey, 58  
Gadaro, 68  
Gaet, 4  
Galantry head, White, 93  
Gaeta, 62  
Galata, 60  
Gallipoli, Italy, 64  
" Dardanelles, 69  
Galle, point de, White, 81  
Gallo, cape, Sicily, 64  
" Italy, 65  
Galloper, light vessel, Red, 5  
Galveston, 119  
Galway bay, 19  
Gambia river, 77  
Gannet rock, Black and White stripes, vertically, 98  
Garden key, Tortugas, White, 116  
Gardiner's island, Brown, 105  
Gare sand, R. Tees, 7  
Gay head, U.S., Red, 103  
Gayo, Pazo I., 66  
Gata, cape, Spain, 54  
" Cyprus, 73  
Gaspé basin, 94  
Gedney's channel, New York, 107  
Geelong, 88  
" light vessel, 38  
Gehlersche Hoek, 23  
Genoa, 60  
George St., point 49  
" cape (Nova Scotia), White, 96  
" (Louisiana), U.S., 117  
Georges St., mouth (R. Danube), 71  
Georgetown, White, 114  
Gibraltar, 52, 53  
Giedser point, 30  
Giglio island, 61  
Gijon, 50

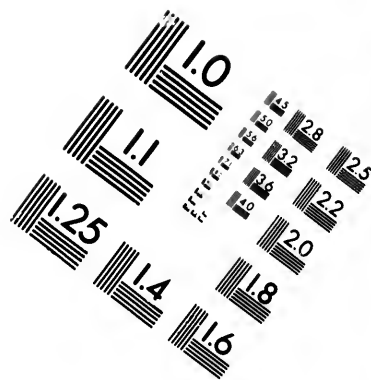
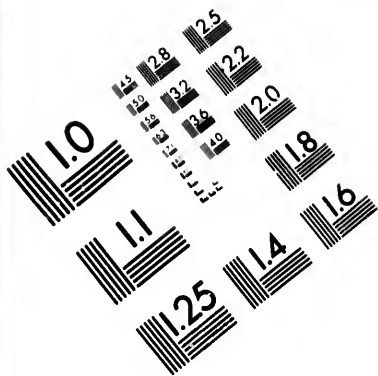
Gilles sur Vie, St., 48  
Giraglia isle, Corsica, 59  
Girdler light vessel (West), Red, 1  
Girdleness, stone, 9  
Girgenti, 61  
Glennel jetty, 86  
Glass island, White, 10  
Glasgow, port, 12  
Gloucester harbour, U.S., Eastern point, White, 101  
Glückstadt, 26  
Goa, White, 80  
Goat island, Maine, U.S., White, 104  
" Newport, U.S., 104  
Gobernadora, Cuba, 121  
Godrevy, stone, octagonal, 16  
Goeree island, 22  
Goes, South Beveland, 23  
Gogah, 79  
Golden Bank light vessel, 73  
Gonzalo river, light vessel, 124  
Good Hope, cape of, iron tower, White, 77  
Goose island, Tasmania, Red and White, 89  
Goree " Africa, 77  
Gorishoek, 23  
Gordware point, Cocanada, sexangular, Black and White bands, 81  
Gottland, 35  
Gottska Sandö, Red, upper part White, 35  
Goulfar bay, 47  
Gozo, Malta islands, 64  
Grado, 65  
Grand island, Kamouraski, 94  
" camp, 43  
" Mannan " 98  
" Ribaud " 53  
" Port, Mauritius, White, 78  
" Rouveau les Ambiez, 58  
Grant's pass, Mobile, U.S., White, 117  
Granton, 8  
Grangemouth, 8  
Granville, 41  
Granitola cape, 63  
Grao de Valencia, 55  
Grave, point de, 49  
Gravelines, 45  
Gravosa, 66  
Great Captain island, White, 106  
Great Curacao island, 123  
" Isaac, Bahamas, Red and White bands, horizontally (15), 122  
" Orme head, 11  
" point, Nantucket, U.S., White, 104  
" Stirrup eav. Red and White bands (5), 122  
" West or Shinnecock bay, brick, 107  
Green island, Catalina, White, 92  
" " St. Lawrence river, White, 93  
" " Nova Scotia, 97  
" point, Table Bay, square tower, 77  
Greenbury point, White, 111  
Greenock, 11, 12  
Greiffswald, brick, 31  
Grimskar, 35  
Gründels Point, Red, 160  
Gründstone island, White, 93  
Grissel Hamm, 25  
Grisnez cape, 45  
Grimskar, White, octangular, 35  
Grundkalle, light vessel, 35  
Gryto, 38  
Guadaloupe, 120

- Guadalquivir river, 52  
 Guadiana, " 52  
 Guanos, 121  
 Guadiana rock, 66  
 Guayaquil, 126  
 Guernsey, St. Peter, *White*, 2, 12  
 Guetaria, 59  
 Guia, R. Tagus, 52  
 Gull island (Little), *White*, 105  
   " stream, light vessel, *Red*, 1  
 Gun Cay, Bahamas, *Red and White*, 122  
 Gunfleet, *Red*, screw piles, 5  
 Gurnet Point, Plymouth, U.S., *White*, 102  
 Guysboro harbour, *White*, 97  
  
 Habibas, 75  
 Haedik, 47  
 Hague, cape de la, 42  
 Haifa, 73  
 Half Moon cay, *White*, 123  
   " reef, Matagonk bay, *White*, iron-  
   " pile foundation, 119  
   " shoal, Galveston, U.S., 119  
 Halifax, Nova Scotia, 97  
 Haliguen, 17  
 Hallo, *White*, 28  
 Hals, N. Pier, 27  
 Haldskov, 29  
 Hammar point, hexagonal tower, 31  
 Hammerfest, 39  
 Hampton roads, 119  
 Hamrah cape, 74  
 Hancock cape, *White*, 127  
 Handkerchief light vessel, *Straw*, 195  
 Hango, lantern, *Red*, 34  
 Hanois rocks, Guernsey, *Grey*, granite, 42  
 Hantsholm, 26  
 Haparanda, 34  
 Haradskar, *Red*, 35  
 Harbour Grace, roof *White* and *Red* stripes, 92  
   " beach light, *White*, 92  
 Harbour island, light vessel, *Red*, 113  
 Harrington, 13  
 Hartlepool (Hengst), *Yellow*, 7  
 Hasborsough, *White*, 6  
   " light vessel, *Red*  
 Hastings, 3  
 Hatteras, " e, U.S., *White* and " s, 115  
   " (beacon, *Red*), 115  
 Hawaii, islands, 91  
 Harwich, 5  
 Hauraki gulf, 59  
 Haut-Banc of Berck, point, 48  
   " du Nord, 48  
 Havana, Morro castle ("O'Donnell" painted  
   " on it, *Stone* colour", 121  
 Havre, 41  
 Havre de Grace, U.S., *White*, 112  
 Hayle, 16  
 Heath Point, Antiochia, *White*, 93  
 Héaux de Bréhat, 41  
 Hebbies, *Red*, 6  
 Hegholm, 36  
 Hekkingen, 39  
 Hela, *White* tower, *Black* dome, 31  
 Helier St. (Jersey), 41  
 Heligoland, 25  
 Hellas, cape, 39  
 Helleso, *Red*; a *White* belt, 38  
 Helvoetsluis, 22  
 Helsingborg, 39  
  
 Helsingør or Elsinore, 39  
 Helwick, light vessel, *Red*, 15  
 Hendopen cape, U.S., *White*, 109  
   " (beacon, *White* screw  
   " pile), 109  
 Henningsvær, 39  
 Hendrick's head, *White*, 109  
 Henry Cape, U.S., 110  
 Heron Neck, *Red*, 39  
 Hesselo island, *Red* and *Yellow* stripe, 27  
 Heve (Le) cape, France, *White*, 11  
   " Nova Scotia, 97  
 Hewett channel, light vessel, *Red*, 7  
 Heyst, 21  
 Hjertholmen, 39  
 Hielm island, 27  
 Highlands of Navasink, *Grey*, 107  
 Hinder (North) light vessel, 21  
   " (West) " 21  
 Hirtshal, 26  
 Hirtsholm, *White*, 27  
 Hobartou, 89  
 Hoburg hill, Gottland, *White*, 35  
 Hoc, 44  
 Hode point, 41  
 Hog island, U.S., *White*, 110  
   " Nassau, *White*, 122  
 Hogland, N. end of, stone, *White*, with *Red*  
   " roofs, 33  
   " S. end of, wood, *Red*,  
   " 38  
 Hogsten, 38  
 Hohe Weg Flat, 25  
 Hoievarde, 37  
 Holburn head, *White*, 19  
 Holmes Hole, *White*, 103  
 Holms Gadd, 31  
 Holyhead, 14  
 Honda cove, 54  
 Honfleur, 43  
 Hood port (Nova Scotia), " s, 115  
 Hoogly river, light vessel, " s, 115  
 Hook tower, Waterford, " s, 115  
   " and lantern *Red*, 17  
 Hooper's straits, light vessel, leam, 111  
 Hope Point fort, 4  
 Horniga Grande, 55  
 Hornby light, *Red* and *White* stripes, 89  
 Horsburgh (Singapore strait), *White*, 85  
 Horsens, 28  
 Horse Shoe light vessel, *Yellow*, 111  
 Horton bluff, *White*, 98  
 Horton's point, Long Island sound, *Red*, 106  
   " cape Fear river, 111  
 Howe cape, 88  
 Hoylake, Liverpool bay, *White*, 11  
 Houten baak, 22  
 Hourtin, 49  
 Howth, Ireland, 17  
 Hoy sound, stone, 16  
 Huesca, 126  
 Huerva, Odeil river, 52  
 Huertas, cape, 55  
 Humber river, 6  
 Humboldt harbour, *White*, 127  
 Hunstanton, *White*, 6  
 Hunting island, *Red* and *White*, 115  
   " (beacon, *White*), 115  
 Hurst point, *Red*, 2  
 Hyannis harbour, *White*, 197  
 Hvilingsø, *White*, roof *Red*, 37  
 Hussein point, 68  
  
 Ibsu cape (Japan), 85  
 Iershoft, stone tower, *Red*, 31  
 Ile d'Amix, 48  
   " de Bas, 40  
   " de Croix, 46  
   " de R6, 48  
   " de Sein, 46  
   " d'Oleron, 48  
   " St. Quay, 41  
   " d'Yeu, 48  
   " Vierge, 46  
 Ilfracombe, *White*, 16  
 Inagea, Great, 122  
 Inishgori, Clew bay, 19  
 Inchkeith, stone, 8  
 Inisheer island, Ireland, a broad *White* belt,  
   " feet wide, horizontally on the shaft of  
   " tower, 19  
 Inishowen, Lough Foyle, *White*, 18  
 Inni-strahull, *White*, 18  
 Inverkeithing, 8  
 Ipswich harbour, U.S., *White* (beacon, *Blue*)  
   " 101  
 Injeh cape, 72  
 Ineboli cape, 72  
 Isabel point, *White*, 119  
 Islay sound, 11  
 Ischia island, 62  
 Isigny, port d', 43  
 Island of Shoals, *White*, 101  
 Isle of May, stone, 8  
   " of Wight, 2  
   " of Man, 13  
 Itacolomi, 124  
 Isletta point, Can. Canaria, 76  
 Ithaca, 66  
 Iviza island, 55  
 Ismid gulf, 79  
 Ives St., 16  
 Ivi cape, 75  
 Iron Pot island, Tasmania, *Red*, 89  
  
 Jackson, port, Australia, 89  
 Jago de Cuba, St., *White* (iron), 121  
 James St., cape, 84  
 Jandia point, Fuerteventura, 76  
 Jane island, light vessel, *Crown*, 111  
 Japara, Java, 83  
 Java island, 85  
 Jean St., fort, Marseille, 58  
 Jersey, 2, 11  
 Jervis bay, Australia, *White*, 88  
 Jijera, 71  
 Jiggina, stone, *Yellow*, 39  
 John's St. (Newfoundland), 92  
   " (New Brunswick), 98  
   " river (U.S.), 116  
 Jomfruland, *White*, roof *Red*, 36  
 Jones point, *White*, 112  
 Jordan's point, James river, *White*, 110  
 José, fort San, Haiti, 121  
 Joseph St., island, U.S., 118  
 Judt strand, 79  
 Judith point, *White*, 105  
 Juhau, San triver Tagus, 52  
 Jupiter inlet, *Red*, brick, 116  
 Julius, 121  
  
 Kaha, port at, 71  
 Kabaalen Grund, light vessel, 33  
  
 Kallian  
 Kallen  
 Kallio  
 Kap  
 Kar  
 Kar  
 Karak  
 Karak  
 Karika  
 Kasar  
 Kastor  
 Katig  
 Katok  
 Katwip  
 Kara  
 Kayou  
 Kawai  
 Keener  
 Kentis  
 Keraso  
 Kephia  
 Kerfel  
 Kessing  
 Key, v  
  
 Khami  
 Kherso  
 Khios s  
 Khorm  
 Kjoon  
 Kiel, 2  
 Kilerad  
 Kell cap  
 Kelling  
 Killybe  
 Kinnar  
 King G  
 King is  
 Kinnat  
 Kinsale  
  
 Kino, 3  
 Kish ba  
 Kioge p  
 Kirkwa  
 Kirkead  
 Kiti cap  
 Klopen  
 Knud's  
 Kingsto  
 Knock  
 Kolber  
 Kobber  
 Kokska  
 Kolah 2  
 Koon B  
 Kootab  
 Korsu, s  
 Korsor,  
 Kiu T  
 Kos ish  
 Koster,  
 Koum  
 Krab, 2  
 Kroat s  
 Kronho  
 Kronst  
 Kuzel  
 Kullen,  
 Kustem

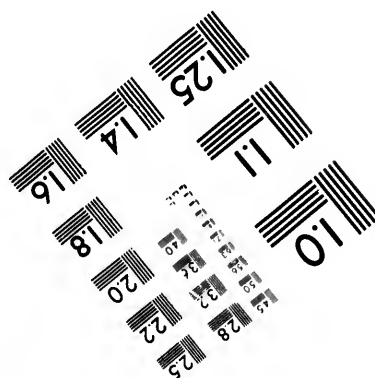
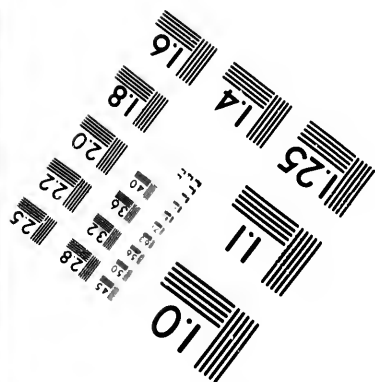
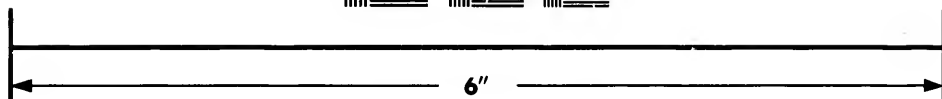
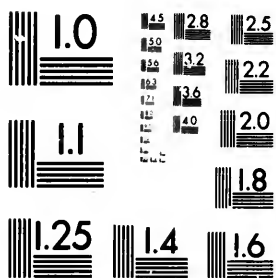


- Kaban, Basso strait, 84  
 Kallindborg, 29  
 Kabilina island, 68  
 Kapshai bay, 67  
 Kapshai cape, 68  
 Karabai, 79  
 Karadash Burma, 73  
 Karakakou bay, 91  
 Karikal, 61  
 Kassandra point, 68  
 Kastro port, Khios, 68  
 Katingsiel, 29  
 Katakola, 67 and 131  
 Katwijk-nan-Zee, 22  
 Kara Birmu, Black sea, 70  
 Kayoulia cape, 67  
 Kawaihoa bay, Hawaii islands, 91  
 Kenery island, 80  
 Kentish Knock, light vessel, *Red*, 5  
 Kerasonda point, 72  
 Kephalaonia island, 66  
 Kerkeh, 72  
 Kessingland, *White*, 5  
 Key, west, *White*, 116  
 " (north-west passage), *Dark*, 116  
 Khania, 69  
 Kheronese cape, 71  
 Khios strait, 68  
 Khoraz point, 70  
 Kyoon, 39  
 Kiel, 29  
 Kileradan head, Ireland, *White*, 19  
 Kil' cape, 72  
 Kellinghorn, high light, *Red*; north light, *Red*; south east light, *White*, 6  
 Killybegs, St. John's point, *White*, 19  
 Kilmurn, light vessel, 71  
 King George sound, 86  
 King island, *White*, 87  
 Kinnaird head, *White*, 9  
 Kinsale head, *White*, with two *Red* belts, 19  
 " fort Charles, *White*, 16  
 Kono, 32  
 Kish bank, light vessel, 17  
 Kioze pier, 30  
 Kirkwall, Orkneys, stone, 9  
 Kirkeaddy, 8  
 Kiti cape, Cyprus, 73  
 Klopen, 38  
 Knud's head, 29  
 Kingstown, Ireland, 17  
 Knock, 25  
 Kobbervig, 37  
 Kobborgmund, light vessel, 27  
 Kokskio, 33  
 Kolah gulf, 71  
 Koon Bunder, 79  
 Kootubdeah island, 82  
 Korsø, stone tower, round, 35  
 Korsør, 29  
 Kin Toan beacon, 85  
 Kos island, 69  
 Koster, *Yellow*, 28  
 Koum Kalch, 69  
 Krab, 23  
 Krout sand, 26  
 Kronborg, 30  
 Kronstadt, 33  
 Kugel bank, 25  
 Kullen, *White* tower, 30  
 Kustenph, 71  
 Kutali road, 69  
 Kwaden Hoek, 22  
 Kykshon, 22  
 Kyle Akin, *White*, 10  
 La Chamno, 18  
 La Craich, 17  
 Laeso channel, light vessel, 27  
 Lagskar, *Red*, 31  
 La Ronque, 13  
 Lamentin point, Haiti, 121  
 Lampedusa island, 61  
 Landguard point, Harwich, *White*, 5  
 Landskrona, 30  
 Langeland, 29  
 Landsort, *White*, round stone tower, 35  
 Langevad, 37  
 Langotangen, *Yellow*, tower, 36  
 Laurie, 49  
 Larne lough, F  
 La Pérotine, 18  
 Latherowhead, S.  
 Latakayah, 73  
 Larnaka, 73  
 Lazarotto point, U.S., *White*, 12  
 Latour, port, 97  
 Leasowe, *White*, 11  
 Leeroon, 38  
 Lee Scar, 12  
 Leervig, 38  
 Leifkimo, light vessel, 66  
 Leghorn, or Livorno, 61  
 Leith east pier, *White*, 8  
 Lepso reef, light vessel, 38  
 Lemna and Ower, light vessel, *Red*, 6  
 Lepreau point, *Red* and *White* stripes, horizontally, 98  
 Lequeitio, 50  
 Lesina, 66  
 Levant, or Titan Id., 58  
 Leyanzo island, 63  
 Levi cape, 42  
 Libby island, Maclias bay, *Green*, 99  
 Lido, 65  
 Lime rock, Newport, U.S., *White*, 101  
 Limon bay, *White*, 123  
 Lindesnas, 36  
 Lipsø island, 67  
 Lismore, (Mussile island), *White*, 11  
 Lissa island, 66  
 Lissan-el-Khabah, 73  
 Lister, Norway, *White* towers, 56  
 Little Bassas, light vessel, 81  
 " Cumberland island, *White*, 115  
 " Curagoa island, 123  
 " Guana, or Elbow cay, 122  
 " Gull island, 105  
 " Hope island, 97  
 Littlehampton, 3  
 Little river, *White*, 99  
 " ferry, Scotland, 9  
 " Ross, *White*, 12  
 Littleton, New Zealand, 90  
 Lipari islands, 64  
 Liverpool, N.W., light ship, 11  
 " bay, Nova Scotia, fort Point, *White*, 97  
 Lizard, *White*, 1  
 Livorno, or Leghorn, 61  
 Llanely, 15  
 Llanos, 59  
 Lobregat river, 57  
 Lloyd's harbour, *White*, 106  
 Lobos Cay, Bahamas, *Red* and *White* bands, 122  
 " point, 127  
 Loc-study, 16  
 Loch Ryan (cairn Ryan), *White*, 12  
 Loggerhead key, Florida reef, 116  
 Loito river, 47  
 Loma point, *Dark*, 127  
 London, New, *White*, 105  
 London shoals, light vessel, 33  
 Long island head, Boston U.S., *White*, 102  
 " sound, 105  
 " pilgrims, brick, *Dark*, 94  
 " point, Provincetown, U. States, *Brown*, 102  
 Longships, *White*, 1  
 Longstone, *Red*, 7  
 Long shoal, light vessel, *Steep*  
 Lonsdale point, *Red* and *White* sounds, 7  
 Lookout cape, U.S., *Red*, 113  
 " point, Chesapeake bay, *White*, 111  
 Loophead, Ireland, *White*, 19  
 L'Orient, 47  
 Lossini island, 66  
 L'Orne river, 43  
 Louis St. (Mauritius), 78  
 Louisburg, Breton island, *White*, with a *Black* vertical stripe, 96  
 Lower Cedar point, light vessel, *Lead*, 112  
 Lowestoft, *White*, 5  
 Luarca, 50  
 Lucia St. (West Indies), 120  
 Lucietta, 66  
 Lucia point, Cuba, *White*, 122  
 Lude, light vessel, 26  
 Lundy island, *White*, 16  
 Lune river, 13  
 Lunenburg bay, Cross Island, *Red*, 97  
 " battery point, a *White* house, 97  
 Lungø island, 34  
 Lyme Regis, 2  
 Lynn Well, light vessel, *Red*, 6  
 Lynus point, *White*, castellated, 11  
 Lysér Ort, stone, *White*, 32  
 Maakala, 34  
 MacArthur's head, *White*, 11  
 Macao, 81  
 Macduff, 9  
 Macdo, 125  
 Macdubao cape, 59  
 Macd'as islands, *White*, 98  
 Macquarie tower, stone, *White*, 89  
 Madras, 81  
 Magdalen islands, 98  
 Magnisi, 63  
 Manon river, *White*, Delaware bay, 109  
 " port, Minorca, 56  
 Maidens, *White* with *Red* belt in the centre, 18  
 Majorca island, 55  
 Malacca strait, 83  
 Malaga, 51  
 Malaguine-log harbour, 84  
 Malamocco, 65  
 Maldonado bay, 125  
 Malmo, 30  
 Maio St., 11  
 Malta island, 64



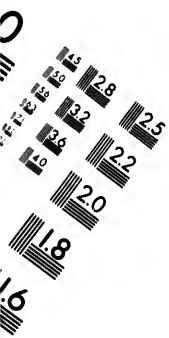


**IMAGE EVALUATION  
TEST TARGET (MT-3)**



**Photographic  
Sciences  
Corporation**

23 WEST MAIN STREET  
WEBSTER, N.Y. 14580  
(716) 872-4503



- Mana island, 90  
 Manchac pass, Lake Pontchartrain, 118  
 Mandavee, 79  
 Manfredonia, 65  
 Manheigu island, *Grey*, 100  
 Mangalore, 80  
 Manila, 84  
 Manoro point, Karachi, 79  
 Maplin, light house, *Red*, screw piles, 5  
 Mapon, light vessel, 49  
 Maranham, 124  
 Marbella, 54  
 Marblehead harbour, *White*, 101  
 Marca, 124  
 Marcoux St., 43  
 Mardyck, light vessel, 46  
 Mareùmo island, 63  
 Margaretville, *White*, 98  
 Margate pier, stone column, 4  
 Maria, cape Santa, 52  
 Marien, circular tower, 29  
 Marjovets, stone, *red* roof, 39  
 Marks St., U.S., *White*, 117  
 Marmora island, 70  
 Marsala, 63  
 Marseille, 58  
 Marshall cove, or Port Williams, *White*, 98  
 Marshall's point, *White* and *Grey*, 100  
 Marstrand, 28  
 Martin St., port, 48  
 Martinicus rock, *Grey*, 100  
 Martinique, 120  
 Martin's industry, light vessel, *Red*, 115  
 Mary St., cape (Newfoundland), brick, 92  
 " " (River Gambia), 77  
 " " port (I. of Man), 13  
 Maryport, 12  
 Martin point, Lobos island, 76  
 Maseskar, *Red*, 129  
 Masulipatam, 81  
 Matagorda, Texas, 119  
 Maternillos point, Cuba ("Colon" painted on it), 122  
 Mathieu St., 46  
 Matifu, 74  
 Maura, Santa, island, 66  
 Maurice river, *White*, 109  
 Maurizio point, 60  
 Mauritius, 78  
 May cape, U.S., *Grey*, 109  
 Mayor cape, Spain, 50  
 Maysi cape, Cuba, 122  
 Mayo's beach, Wellfleet bay, *Brown*, 102  
 Mazarron, 54  
 Megalo-Kastron, Caudia, 69  
 Melilla, 75  
 Memel, round tower, *Red*, 31  
 Menai, Trwyn-Du Point, *White*, 14  
 Menscheneter (Java), 83  
 Mercer head, *White*; roof *Red*, 93  
 Merninji, cape, 68  
 Merrill Shellbank, screw-pile foundation, 118  
 Mersina, 73  
 Mesa de Roldan, 54  
 Mesnil, 41  
 Messina, 63  
 Mesurado cape, 77  
 Metway, or Medway head, *White*, with a *Black* square, 97  
 Michel St. (Azores), 76  
 Middelburg (Java), 83  
 Middelfart, 28  
 Middelharnis, 22  
 Midtholmen, 37  
 Mifflin fort, U.S., 109  
 Milazzo, 64 and 131  
 Milford Haven, 15  
 Minehead, 17  
 Minot's ledge, U.S., granite, 102  
 Minquiers, 41 and 130  
 Mintok, 84 and 131  
 Minicoy, 80  
 Miramichi bay, 95  
 Miscou island, *White*, 95  
 Miseno cape, 62  
 Missolonghi, 67  
 Mityleni island, 68  
 Mobile point, *White*, 117  
 " " beacons, *Red*, *White*, 117  
 Moen island, square tower, 30  
 Mola, 65  
 Molenhavn, 22  
 Molfetta, 65  
 Monach islands, *White*, 10  
 Monance St., 8  
 Mondago cape, 51  
 Monomoy point, *Red*, 102  
 Monemvasia cape, 65  
 Montauk point, *White*, 105  
 Monte Circello, 61 and 130  
 " Rosello, 63  
 Monterey, 127  
 Monte Video, 125  
 Montrose, *White*, 9  
 Montserrat, 121  
 Monte's point de, *White*, 93  
 Moose peak, *White*, 99  
 Monopoli, 65  
 Morant point, Jamaica, *White*, 121  
 Morecombe bay, light vessel, 13  
 Moreton bay (N.E. point, tower *White*), 89  
 Morgan point, *White*, 105  
 Morlaix, 40  
 Morjovets, 39  
 Morro de S. Paolo, 125  
 Morsaline, 43  
 Morup Tånge point, *White*, 27  
 Mosel bay, 78  
 Moss haven, 36  
 Mostaghanem, 75  
 Mouduga, stone, circular tower, *Yellow*, 39  
 Mouille point, Table Bay, *Black* and *White* bands, 77  
 Mount Carmel, 73  
 " Desert, *Grey*, 99  
 Mouse, light vessel, *Red*, 4  
 Mucking Flat, *White*, with *Black* band under lantern, on piles, 4  
 Mull sound (Kuna Gal rk.), *White*, 11  
 " of Cantire, *White*, 11  
 " of Galloway, stone, 12  
 Mumbles, *White*, 15  
 Munk Holm, Trondhjem, square stone tower, 38  
 Muros bay, 51  
 Murro di Porco (Sicily), 63  
 Muthah river, light vessel, 82  
 Mutton island, Galway, *White*, railing *Red*, 19  
 Nab, light vessel, *Red*, 3  
 Nakke head, square towers, 30  
 Nantouar bridge, 40  
 Nantucket, great point, *White*, 104  
 " Sankaty head, *White*, *Red*, *White*, 104  
 " Brant point, *Red*, 103  
 " " (beacons *White*), 103  
 " New South Shoals, light vessel, *Red*, 104  
 Naples, 62  
 Nargen, stone, *Light Grey*, 32  
 Narraguagus, *Red*, 99  
 Narva, stone, *White*, 33  
 Nash point, *White*, 15  
 Nashs island, *White*, 99  
 Näskubben rock, 35  
 Nassau harbour, Hog island, *White*, 122  
 Natal, 78  
 Nauset beach, U.S., *White*, 102  
 Naval hospital, Hampton roads, *White*, 110  
 Navalo por., 47  
 Navesink Highlands, *Grey*, 107  
 Nayat point, *White*, 105  
 Nazaire St., 47  
 Naze of Norway, 36  
 Ned's point, Mattapoisett, U.S., *White*, 104  
 Needles rock, granite, 2  
 Negapatam, 81  
 Negro island, *White*, 100  
 Negropont canal, 67  
 Nemours, 75  
 Nelson harbour, New Zealand, 90  
 Neuse river, *White*, screw pile, 113  
 Neustadt, 29  
 Neuwerk, 25  
 Neuzeu, 23  
 Neva, light vessel, 33  
 Newark, light vessel, *Red*, 6  
 New Baltimore, Hudson river, *White*, 108  
 Newbury port harbour, U.S., *White*, 101  
 New canal, Lake Pontchartrain, U.S., *White*, 118  
 Newcastle, Australia, 89  
 Newhaven (Scotland), *White*, 8  
 " (England), 3  
 New Drop (beacon, *Red*), 103  
 " Dungeness, *White* and *Black*, 128  
 " Haven, Five-mile point, *White*, 106  
 New Haven, Long Wharf, *White*, 106  
 " Passage, 16  
 " London, *White*, 105  
 " Point Comfort, *White*, 111  
 Newport, U.S., (Goat island), *White*, 104  
 " R. Tay, 8  
 Nice, 59  
 Nicholas St., island (R. Loire), 47  
 Nicholson port, 90  
 Nicoya gulf, 127  
 Nidingen rock, *White*, hexagonal towers, 27  
 Nieuport, 21  
 Nieuwe Diep, 22  
 Nisita island, 62  
 Nobsque point, *White*, 103  
 Noordwijk-aan-Zee, 22  
 Nore light vessel, *Red*, 4  
 Norrskaeren, brick, lantern *Red*, 34  
 North Foreland, *White*, 4  
 Northfleet, 4  
 Northumberland, cape, 87  
 North Hinder light vessel, 12  
 " Ronaldska, brick, 10  
 " point, *White*, 112  
 " Sand Head light vessel, *Red*, 4  
 " Shields, 7 and 129

North  
N7A  
North  
Norw  
Nouv  
Nuevi  
Nybo  
North  
Noss  
Nya

Oak is  
Oban,  
Ochak  
Oerae  
Odder  
Odens  
Odesa  
Odet r  
Offer V  
Old F  
Old Fi  
Old Pa  
Oneg  
Ons is  
Ooltge  
Onst  
Oporto  
Oran,  
Oranie  
Orford  
tally  
Orinoc  
Orkney  
Orlov,  
Orme  
Ornsay  
Oropes  
Orskar  
Orsvaa  
Orso D  
Ortiz b  
Ossenh  
Ostend  
Osterg  
Ostra  
Otago,  
Otway,  
Ouess  
Outo. c  
Outer  
Oversa  
Ower's  
Owl's  
Oxbam  
Oxo, 1  
Oyster  
  
Paarle  
Paker  
Palais  
Palame  
Palern  
Palma,  
Palmaj  
Palmas  
Palmet  
Palco  
Palos c  
Palmas

- ite, 104  
White, Red, White,
- l, 103  
Paccons (White), 103  
Boals, light vessel,
- 32
- White, 122
- 102  
Bads, White, 110
- 07
- J.S., White, 104
- nd, 90  
ile, 113
- er, White, 108  
s., White, 101  
in, U.S., White, 118
- e, 8
- 8  
Black, 128  
t, White, 106  
White, 106
- 111  
d), White, 104
- re), 47
- gonal towers, 27
- 1  
Red, 34
- 21
- el, Red, 4
- North-west light vessel, Liverpool, Black, with  
White stroak, 14  
North Watcher, 83  
Norwalk island, White, 108  
Nouvelle port, 57  
Nuevitas harb., 122  
Nyborg harb., 29  
North Unst, Shetlands, White, 10  
Noss head, Scotland, 9  
Nya Elsborg, 28
- Oak island, Cape Fear river, White, 114  
Oban, 11  
Ochakov, 71  
Ocracoke island, White, 113  
Odderø, 36  
Odensholm, stone, Red; roof, White, 32  
Odessa, 71  
Odet river, 46  
Offer Wadhams island, brick, 92  
Oland island, S. point, White, 35  
Old Field point, White, 106  
Old Point Comfort (Beacon, Black), 110  
Oneglia port, 60  
Ons island, 51  
Ooltgensplaat, 23  
Oostvoorne, 22  
Oporto, 51 and 130  
Oran, 75  
Oranienbaum, 33  
Orfordness, Red and White in bands, horizon-  
tally, 5  
Orinoco river, light vessel, 124  
Orkney islands, 10  
Orlov, stone, Red roof, 39  
Orme (great) head, Grey, stone, 13  
Ornsay, W. of Scotland, 10  
Oropesa cape, 55  
Orskar, White, octagonal, 35  
Orsvaag, 39  
Orso D', cape, 62  
Ortiz bank light vessel, 125  
Ossenhoek, 21  
Ostend, 21  
Ostergarne, Gottland, White, 35  
Ostra Finngrund light vessel, 34  
Otago, White, 90  
Otway, cape, White, 87  
Ouessant, 40  
Outo, or Utü, stone, Grey, 34  
Outer Dowsing light vessel, Red, 6  
Oversay island, 11  
Ower's light vessel, Red, 3  
Owl's head, White, 100  
Oxhammer, Red; a White belt, 37  
Oxo, White; roof, Red, 36  
Oyster beds, White, Savannah river, 115
- Paarde Markt light vessel, 21  
Paker Ort, stone, White, 32  
Palais port, 47  
Palamos, Spain, 130  
Palermo, 64  
Palma, Majorca, 56  
Palmajola island, 61  
Palmas, Gran Canaria, 76  
Palmer island, New Bedford, U.S., White, 104  
Paleo Kastro, Candia, 69  
Palos cape, 55  
Palmas cape, 77
- Palumbo rock, 63  
Pamplico, White, 113  
Pancha island (Ribadeo), 50  
Panomi point, 68  
Panmure head, Cardigan bay, White, 93  
Paolo St., island, 64  
Pará, 124  
Paredon Grande, Cuba, iron, Brown, 122  
Partridge island, Parsborough, White, 98  
" " St. John's, Red and White  
stripes, vertically, 98  
Pasages port, 49  
Pascagoula river (East), U.S., 117  
Pasha island, 68  
Paspargo island, 68  
Pas Yew islet (Tung river), Red and White  
bands, 85  
Passaic river, U.S., Brown, 108  
Pass à l'Outro, Black, 118  
Pass Christian, White, 117  
Passero cape, Sicily, 63  
Patiras isle, 49  
Patras, 67  
Patrick port, 12  
Paul cape, Kertch strait, 72  
" St. (de Loando), 77  
" (Reunion), 78  
" " island, White, 93  
Paull, Red, 6  
Panillac, 49  
Paumben pass, 81  
Paxo island, 66  
Pedra Branca, Singapore, White, 83  
Piedras Cay del Sur, Cochinings bay, Brown, 121  
Peel harbour, Man, 13  
Peiræus of Athens, 67  
Pelgosa island, 65  
Pelée island, Cherbourg, 42  
Pemaquid point, White, 100  
Pembrey harbour, 15  
Pembroke cape, White and Red bands, 126  
Penas cape, 50  
Penfret, 46  
Penlan point, 47  
Penmarc'h point, 46  
Penobscot bay, 99  
Pensacola (Barancas), White, 117  
" (Bar beacon, White), 117  
Pentland Skerries, stone, 5  
Penzance, White, 1  
Pepe cape, Cuba, 121  
Perim island, G. of Cambay, 79  
Perim island, Red Sea, 79  
Pera, cape (Majorca), 56  
Pernambuco, 124  
Pernis, 23  
Pernau, 32  
Perros road, 40  
Pertusato, cape, Corsica, 59  
Pertuis Breton, 48  
Pesaro, 65  
Pescadores, 84  
Peterhead, Scotland, 9  
Peterhof, 33  
Peter island, White, 98  
" St. (Guernsey), 42  
Petit Menan, Grey, 99  
Petite Terre, 120  
" Passage, 98  
Pettycur, 8  
Phladda island, White, 11
- Philippines, 84  
Phillip, port, Australia, 87  
Pi, port, 56  
Pianosa island, 61  
Piave Vecchia, 65  
Pictou harbour, White, 96  
" island, White, 96  
Pietro St., island, Sardinia, 69  
Pier Holm, 37  
Pilier island, 48  
Pillau, round tower, White, 31  
Pilot ridge, light vessel, 82  
Pine, cape, Red and White bands, 92  
Pines, I. of Cuba, 121  
Piney point, White, 112  
Pinos point, Grey, 127  
Piskieri cape, 69  
Pitre à, point, 120  
Pittenweem, 8  
Pladda, stone, 11  
Plana, Tabarca island, 55  
Panier rock, 53  
Plateau de la Banche, 47  
Platon point, 94  
Pleasantons island, 118  
Ploumanac'h port, 40  
Plum island, White, 105  
Plum point, Jamaica, White, 121  
Plymouth, U.S., White, 102  
Plymouth, breakwater, stone, 1  
Po di Goro, 65  
Poge, cape, U.S., White, 103  
Pola, C. Compare, 66  
" Santa (Spain), 55  
Pollock Rip, light vessel, Red, 103  
Pondicherry, 81  
Pond island, White, 100  
Pontailac, 49  
Pontchartrain, U.S., White, 118  
Ponza island, 62  
Poolbeg, Dublin, White, 17  
Poole, 2  
Pool island, White, 112  
Poplar point, White, 105  
Forman, 55  
Pornic port, 48  
Porquerolles island, 58  
Portalegre, 125  
Portbail, 41  
Portland head, U.S., White, 101  
" breakwater, U.S., White, 101  
" bill, White, 2  
" bay, Australia, 87  
Portrieux, 41  
Portsmouth, U.S., White, 101  
Portzic point, 46  
Poti, 72  
Povoa de Varzim, 51  
Prasto, 38 and 130  
Prim point, Hillsboro' bay, White, 96  
Prico's creak, Cape Fear river, White, 114  
Prince's channel, light vessel, Red, 4  
Princess Royal harbour, Australia, 86  
" bay, New York, 108  
Procida island, 62  
Prior, cape, 51  
Priorino, cape, 51  
Proctorville (beacon, White), 118  
Promontore, cap.  
Prudencia island, White, 105  
Pubnico harbour, Beach point, White, 97

- Puerco (Iviza island), 55  
 Puerto Rico, 121  
 Puget sound, 128  
 Pulicat, 81  
 Pulo Candore, 84  
   " Dahan, light vessel, 84  
 Pumpkin island, *White*, 100  
 Pateolano, 62  
  
 Quaco, *Red* and *White* bands, horizontally, 98  
 Queenscliff, Port Phillip, 87  
 Querqueville fort, Cherbourg, 42  
 Quiberon bay, 47  
 Quillebœuf, 43  
 Qvitholm, *White*, stone tower, 38  
  
 Race, cape, south-east face *Red* and *White*  
   vertically, 92  
   " islands, *Stone*, 128  
 Race point, cape Cod, U.S., *White*, 102  
 Rachada cape, *White*, 83  
 Raffles (Singapore strait), *White*, 83  
 Rakof, 86  
 Ramsey, Man, 13  
 Ramsgate, granite, 4  
 Rangoo, 8  
 Ras Ibn Mani, 73  
 Rathlin island, Altacorry head, *Red* belt under  
   the gallery, 18 and 129  
   " O'Birne, dome and blocking under it,  
   *Red*, 19  
 Rattlesnake shoals, light vessel, *White*, 114  
 Ravenna, 65  
 Raza, *Red* square, 125  
 Raz de Sein, 46  
 Razzoli island, Sardinia, 60  
 Recife cape, *Red* and *White* bands (4), 78  
 Red Fish bar, Galveston, U.S., 119  
   " islet, St. Lawrence river, *Grey* stones, 93  
 Reedy island, *White*, 109  
 Reef Ness, square tower, 29  
 Reggio, 64  
 Régneville, 41  
 Reine harbour, 33  
 Renesse, 22  
 Renskar, *Grey* granite, upper part *White*, 34  
 Réunion, 78  
 Revel, mount Laksberg, stone, *White*. And  
   octagonal tower, *Red*, 33  
 Revelstein, light vessel, 32  
 Rhodes, 69  
 Rhynns of Islay, *White*, 11  
 Ribadeo (Pancha islet), 50  
 Ribble river, 13  
 Richard, 49  
 Richibucto head, *White*, 95  
 Richmond, Prince Edward island, 96  
 Riga, 32  
 Rigolets, *White*, 118  
 Rimino, 65  
 Ringholm, 38  
 Rio de la Hacha, 123  
   " de Janeiro, 125  
   " de Plata, 125  
   " Grande, Texas, 119  
   " do Sul, 125  
   " do Norte, 124  
 Rithymno, Candia, 69  
 Rivadesella, 50  
 River Amur, 86  
  
 River Adour, 49  
   " Bug, 71  
   " Danube, 71  
   " Dniester, 71  
   " Elbe, 25  
   " Gambia, 77  
   " Guadalquivir, 52  
   " Gironde, 48  
   " Guadiana, 52  
   " Humber, 6  
   " Hoogly, 82  
   " L'Orne, 43  
   " Loire, 47  
   " Mutlah, 82  
   " Odeil, 52  
   " Seine, 43  
   " Shannon, 19  
   " St. Lawrence, 94  
   " Somme, 45  
   " Saigon, 84  
   " Swan, 86  
   " Tagus, 52  
   " Tees, 7  
   " Tyne, 7  
   " Thames, 4  
   " Touques, 43  
   " Weser, 25  
   " Yung, 85  
   " Yang-tse, 85  
 Rix, round tower, *White*, 31  
 Roa, 50  
 Roanoke marshes, *White*, screw pile, 113  
 Roanoke river, light vessel, straw, 113  
 Robben island, Table Bay, *Red* and *White*  
   bands, 77  
 Rock point, Westport, U.S., 104  
 Robbins reef, *White*, 103  
 Roche point, Cork, *White*, 16  
   " Bonne, 48  
 Roca cape, 52  
 Rochelle harbour, 48  
 Rock, Liverpool bay, *White*, 14  
 Rockabill, *Grey*, stone, 18  
 Röd point, 36  
 Rodo, 38  
 Rodskär, 33  
 Rodvig, 30  
 Roevar, 37  
 Rona (south), 10  
 Romain, cape, brick, 114  
 Roman rocks, 77  
 Romblon island, 84  
 Rondout, Hudson river, *White*, 108  
 Ronne harbour, 30  
 Rondö, *Red*, a *White* belt, 38  
 Roque Bermejo, Teneriffe, 75  
 Ronaldsha, (Orknays), 10  
 Roquetas, 54  
 Rosa, cape, 74  
 Rosas bay, 57  
 Rosetta mouth, R. Nile, 74  
 Rossa porta, Corsica, 59  
 Rosso porto, Lagosta island, 66  
 Roseway cape, *Black* and *White* stripes, verti-  
   cally, 97  
 Rottneest island, stone, *White*, 86  
 Roulili point, Black sea, 70  
 Round island, Mississippi, *White*, 117  
   " Machias bay, 99  
 Rovigno, 65  
 Royal shoal, light vessel, *Lead*, 113  
  
 Rozier cape, *White*, 93  
 Royan, 49  
 Runa Gal, Mull, 11  
 Rudha Mhail, *White*, 11  
 Rugged island harbour, Gull rock, *White*, 97  
 Runö, hexagonal, *Yellow*; lantern, *Red*; top,  
   *Green*, 32  
 Runcorn, 14  
 Ruytingen, 46  
 Ryde pier, 3  
 Rye, tide lights, 3  
 Ryvarden, 37  
 Russkaia spit, 71  
  
 Sabinal point, 54  
 Sabine pass, *White*, 119  
 Sable cape, *White*, 97  
 Sables d'Orne, 48  
 Sacratif cape, 54  
 Saddleback ledge, upper part *Grey*, lower part  
   *White*, 99  
 Saghalin, 85  
 Saigon river, 84  
 Said port, 74  
 Saire point, 42  
 Salinas, Majorca, 56  
 Salmedina rocks, Guadalquivir river, 52  
 Salou, cape, 56  
 Saltoats, 12  
 Saloniki, gulf of, 68  
 Salut islets, Cayenne, 124  
 Saluria, Texas, 119  
 Saltees, light vessel (*Two Balls*), 17  
 Salvatore fort, 63  
 Salvora island, 51  
 Samana bay, 121  
 Samarang, 83  
 Sambro' island, Nova Scotia, *White*, 97  
 Samos island, 68  
 Samsø, 28  
 Samsoun bay, 72  
 Sanda (ship rock), *Stone*, 11  
 Sandalo cape, 67  
 Sandhammeren, 35  
 Sandlock channel, 20  
 Sand island, Mobile, *White*, 117  
   " Key, Florida reef, *Dark*, iron pile, 116  
 Sandz point, *White*, 107  
 Sandy Hook, lighthouse, *White*, 107  
   " (beacons, *White*), 107  
   " light vessel, *Red*, 107  
   " Neck, Barnstable, U.S., 102  
   " point, brick, 111  
 Sanginaire island, 59  
 Sanjak spit, Smyrna, 68  
 Sankaty head, *White*, *Red*, *White*, 104  
 Sansego island, 66  
 Santander, 50  
 Santipilly, 82  
 Santona, 50  
 Santos, *White*, 125  
 Sarhoug, 37  
 Sapelo island, *Red* and *White*, in horizontal  
   stripes, 115  
   " (Deacon, *Black*), 115  
 Saugerties, Hudson river, *White*, 108  
 Sarhoug, *White*, square tower, 37  
 Saugor island, 82  
 Saundersfoot, 15

- Sauzon port, 47  
 Savage island, Akyab, 82  
 Savannah river, 115  
 Savona port, 60  
 Saybrook point, *White*, 106  
 Szalmitzk, light vessel, 73  
 Scala Nuova road, 68  
 Scalpay island, 10  
 Scarborough pier, *White*, 6  
 Scaramia, or Secca point, 63  
 Scarweather sand, light vessel, *Red*, 15  
 Scatari island, *White*, 96  
 Schanck, cape, *White*, 88  
 Schevinengen, 22  
 Schiedam, 23  
 Schiermonnik Oog, *Red*, 22  
 Schojack channel, Hudson river, *White*, 108  
 Schowen island, 21  
 Schulau, 26  
 Scilly, St. Agnes, *White*, 1  
 Sea Reach, 4  
 Seaham, (Red acre port), stone, 7  
 Sea island, bay of Fundy, *White*, 98  
 Seaton, stone, 7  
 Sea-wolf island, Nova Scotia, *White*, 96  
 Sebastian, San, 49  
 " " cape, 57  
 Sedashigur bay, *White*, 80  
 Sedersher, 34  
 Seddul Bahr, 69  
 Seguin island, *Grey*, 100  
 Segna, 66  
 Seine river, 43  
 Seiro, circular tower, 29  
 Senegal, 77  
 Sénéquet, 41  
 Sepet, cape, 58  
 Sept isles, 41  
 Seraglio point, 70  
 Seskär, iron, *Red*, 33  
 Sesklo, cape, 67  
 Seto-uchi, (Japan), 85  
 Setuval, or St. Ubes, 52  
 Sevastopol, 72  
 Seven Foot Knoll, *Black*, screw pile, 112  
 Seven Stones, light vessel, *Red*, 1  
 Sgiermoile, *White*, 11 and 129  
 Shambles shoal, light vessel, *Red*, 2  
 Shablah, cape, 71  
 Sharp island, *White*, 111  
 Shediae, 95  
 Sheerness, 4  
 Shelburne, 97  
 Shell Keys, *Red*, 119  
 Sherbrooke tower, *White*, *Red* roof, 97  
 Shershel port, 75  
 Shetland islands, 10  
 Ship island, Mississippi, *White*, 117  
 Shipwash, light vessel, *Red*, 5  
 Ship shoal, *Brown*, screw pile, 119  
 Shoalwater bay, Toke point, *White*, 127  
 Shoreham, *White*, greystone, 3  
 Shoals, isle of, *White*, 101  
 " " point of, *White*, screw pile, 110  
 Shortland bluff, *White*, 87  
 Shovelful, light vessel, *Green*, 103 and 131  
 Sierra Leone, cape, 77  
 Sigrí, cape, 68  
 Simon's bay, 77  
 " " island, U.S., *White*, 115  
 Silleiro, cape, 51  
 Singapore, 83  
 Singes island, 74  
 Sinigaglia, 65  
 Sinoub, 72  
 Sisal, 123  
 Sisargas islands, 51  
 Sjaaholmen, 39  
 Sivri, cape, 68  
 Skellanger, *Yellow*, 38  
 Skagen, or Skaw, circular, *Red* bricks, 27  
 Skelligs, *White*, 20  
 Skerries, *White*, 14 and 129  
 Skerryvore, stone, 11  
 Skinburness, 12  
 Skude Ness, 37  
 Skutari, 70  
 Sligo, Black rock, *White*, 19  
 Slipshavn, 29  
 Slottero, *Red*, a *White* belt, 37  
 Sloc, 21  
 Slyne head, Ireland, *White*, 19  
 Smalls, *Red* and *White* bands, 15 and 129  
 Smith island, Fuca strait, *White*, 128  
 Smith point, light vessel, *lead*, 111  
 Smyrna, 68  
 Socoa port, 49  
 Söderarm, *White*, stone tower, 35  
 Soder Skar rock, 34  
 Soller port, Majorca, 56  
 Solovetski, 39  
 Solway, light vessel, 12  
 Sosnovets, 39  
 Sombrero, Florida reef, iron pile building, 116  
 " " West Indies, 121  
 Sommars, stone, *White*, 33  
 Sound of Mull, 11  
 Somme river, 44  
 Soukhoum point, 72  
 Sourop, old tower, stone, *White*: new tower, wood, *Yellow* (eastern face *White*, and lantern *Red*), 32  
 Southampton, 2  
 Southsea, 3  
 Southend pier-head, 4  
 South Bishop, *White*, 15  
 " " Foreland, *White*, castellated, 4  
 " " rock, near Belfast bay, *White*, 18  
 " " Passage, Mississippi river, 118  
 " " Roman rock, Simon's bay, iron tower, *Black* and *White*, 77  
 " " Rona, *White*, 10  
 " " Shoal, light vessel, 104  
 " " Sand head, light vessel, *Red*, 4  
 " " Traverse, light vessel, 94  
 " " -west passage, Mississippi, *White*, 118  
 " " " point, Anticosti, *Grey* stones, 93  
 " " " reef, *Red*, 119  
 Southernness, *White*, square tower, 12  
 Sow and Pigs shoal, light vessel, *Red*, *Yellow* streak, 104  
 Spathi, cape, 67  
 Spatel, cape, 75  
 Spartivento, cape (Sardinia), 60  
 " " (Italy), 64  
 Spear, cape, *Red* and *White*, horizontally, 92  
 Spezzia bay, 61  
 " " island, 67  
 Spoon island, 99  
 Spotsbiere, 27  
 Sprogö, 29  
 Spurn, light vessel, *Red*, 6  
 Spurn lighthouses, high, *Red*; low, *White*, 6  
 Stack, south, *White*, 15  
 Stamsund, 39  
 Stangholm, 36, 39  
 Stallingboro', 6  
 Start point, England, *White*, 1  
 " " Orkneys, *White*, 10  
 Stavenisse, 23  
 Stavoren, 24  
 Steenen bank, 21  
 Stefano, San, 61  
 Steilene island, 36  
 Stephano Burun, 70  
 Stephens port, *White*, 89  
 Stevns cape, 30  
 Stingray point, *White*, screw pile, 111  
 Stone Pillar, *White*, 94  
 Stony point, Hudson river, *White*, 108  
 Stonington, *White*, 105  
 Stonehaven, 9  
 Stora gulf, 74  
 Storens, 26  
 Stor Jungfrun, *White*, 35  
 Stormoway, *White*, 10  
 Straitsmouth harbour, *White*, 101  
 Stratford point, *Black* and *White* in stripes, 106  
 " " light vessel, *Straw*, 106  
 Strijen-Sas, 23  
 Strivali islands, 67.  
 Sturt, Kangaroo island, *White*, 86  
 Stuyvesant, Hudson river, *White*, 108  
 Suances, 50  
 Succunneset, light vessel, squares of *Red* and *Cream*, 103  
 Suda, Candia, 69  
 Suez, light vessel, 79  
 Sulina, R. Danube, 71  
 Sullivan island, Charleston, U.S., 114  
 Sumburgh head, Shetlands, stone, 10  
 Sumter, fort, U.S., 114  
 Sunderland, *Yellow*, 7  
 Sunk, light vessel, *Red*, 5  
 Surinam, 124  
 Susquehanna river, 112  
 Susca, 49  
 Svartklub, *White*, stone tower, 35  
 Sviatoi Ness, *Yellow*, wood, 39  
 Svendborg, 29  
 Svinö, 38  
 Swaffer Ort, stone, *White*, 32  
 Swallows Tail, Grand Manan, *White*, 98  
 Swanage pier, 2  
 Swan island, Tasmania, *Red* and *White*, 89  
 " " river, stone, *White*, 86  
 " " spit, port Phillip, *Red*, 87  
 Swansea harbour, 15 and 129  
 Swash, Texas, *White*, iron pile foundation, 119  
 Swatow, 84  
 Swine Bottom, light vessel, 30  
 Swinemünde, 31  
 Swin Middle, light vessel, *Red*, 5  
 Sydney, Australia, 89  
 " " Breton island, *Red* and *White*, vertically, 96  
 Sydost Brodden, light vessel, 34  
 Syrt, 26  
 Sylt island, 67  
 Syracuse, 63  
 Taars, 29  
 Table bay, 77



- Taetan island, 84  
 Tagus river, 52  
 Tahiti, Point Venus, 91  
 Takli, cape, 72  
 Talamone, 61  
 Talais bank, 49  
 Tampico, 123  
 Tancarville, 44  
 Tapia island, 50  
 Taptee, Gulf of Cambay, 79  
 Taranto, 64  
 Tarbert, 19  
 Tarbet ness, *White*, 9  
 Tarifa, 52  
 Tarkan, cape, 71  
 Tarpaulin cove, *White*, 104  
 Tarragona, 57  
 Taske (Japan), 85  
 Tavolaro, cape, Sardinia, 60  
 Tchefuncti river, *White*, 118  
 Tees bay, 7  
 Tearaght island, 20  
 Teignmouth, limestone tower, 2  
 Teignouse, 47  
 Tellicherry, 80  
 Tenants harbour, *White*, 100  
 Tenby pier-head, 15  
 Tendra island, 71  
 Tenez, cape, 75  
 Tenedos island, 68  
 Tenpound island, Gloucester, U.S., *White*, 101  
 Terningen, 38  
 Terracina, 62  
 Terre Negre, 48  
 Terribles, 82  
 Terschelling, 22  
 Testa, cape, Sardinia, 60  
 Texel island, 22  
 Themistocles, cape, 67  
 Therapia, 70  
 Thisted, 26  
 Thomas point, *White*, 111  
 " St. (Mohlenfel's point), *White*, 122  
 Throgg's neck, *White*, 107  
 Thuno, quadrangular tower, 23  
 Tierra Firme, 123  
 Tignoso rock, 66  
 Timballier bay, *White*, 118  
 Tina Major, 50  
 Tinoso, cape, 54  
 Tipaza, 75  
 Tiri-tiri, Matangi island, 90  
 Tobago, Bacolet point, *Red and White*, 120  
 Tobur Ali, 84  
 Tolboukin, stone, *White*, 33  
 Tompkins fort, U.S., *White*, 108  
 Tongue, light vessel (East), *Red*, 4  
 Tonnig, 26  
 Tofana, 71  
 Torgauten island, 36  
 Torgersö, 36  
 Tornea, 34  
 Torres port, Sardinia, 60  
 Torquay pier-head, 2  
 Torre vieja, 55  
 Torrox, 54  
 Torungen islands, *White*, 36  
 Tortosa, cape, 56  
 Tory island, *White*, 19  
 Toulguet point, 46  
 Toulon, 58  
 Touques river, 43  
 Tour de By, light vessel, 49  
 Toward, *White*, 11  
 Tralee, Little Samphire island, blue stone, 20  
 Trafalgar, cape, 52  
 Trapani, 63  
 Travemünde, 31  
 Traverse, South, 94  
 Trebizond, 72  
 Treguier river, 41  
 Trepert, 44  
 Trevoise head, *White*, 16  
 Triagoz, 40  
 Trieste, 65  
 Trincomalie, 81  
 Trindelen, light vessel, 27  
 Trinidad, 120  
 Tripoli, Syria, 73 and 131  
 Tripoli, Africa, 74  
 Troon, 12  
 Tropoz St., 59  
 Troubridge shoal, iron, *Red and White stripes*, 86  
 Tse-le island, *White*, 85  
 Tuckanuck shoal, 103  
 Tunge ness, 37  
 Tunis, gulf of, 74  
 Turkey point, *White*, 112  
 Turks island, *White*, 122  
 Turn Holm, 39  
 Turneff Cays, 123  
 Tuskar, *White*, 17  
 Tusket river, Nova Scotia, 97  
 Tuticorn, 81  
 Twofold bay, Australia, *White*, 88  
 Tybee island, *White*, 115  
 " (Beacon, *White*), 115  
 Tynemouth, *White*, 7  
 Tyne river (North Shields), *White*, 7  
 Udsire, *Red* towers, 37  
 Uleaborg, 34  
 Umea, 34  
 Umpqua river, 127  
 Umur banks, light vessel, 70  
 Understen, brick, with *White* stripes, horizontally, 35  
 Unst North, Shetland, 10  
 Upper Cedar point, light vessel, *Cream*, 112  
 Upper Jetty Range, cape Fear river, *White*, 114  
 Urk island, 24  
 Ushruffi reef, open iron work, *Red*, 79  
 Ushant, 40  
 Ushenish, *White*, 10  
 Usk river, *White*, 16  
 Utklippor rocks, stone tower, 35  
 Ut Grunden, Kalmar Sound, 129  
 Vaag, 38  
 Vaardingen, 23  
 Vado port, 60  
 Valery-en-caux, St., 44  
 Van Wies' point, Hudson river, *White*, 109  
 Veiro, 29  
 Valentia, Cromwell's fort, *White*, 20  
 Valetta harbour, 64  
 Valparaiso, *White*, 126  
 Vaquerie, 43  
 Varnäs, 36  
 Varna bay, 71  
 Varne, light vessel, 3  
 Vast la Hogue, St., 42  
 Vathi, port, 68  
 Vecchio, Porto, 59  
 Vedbek, 30  
 Veere, 21  
 Velez Malaga, 54  
 Vendres, 57  
 Venere, 61  
 Venus point, Tahiti, 91  
 Ver, pointe de, 43  
 Vera Cruz, *White*, 123  
 Verolut breakwater, Jersey, *White*, 42  
 Verde cape, 76  
 Verklikker, 21  
 Vicente San, cape, 52  
 Vierge Ile, 40  
 Viesti, 65  
 Villa, stone, circular tower, 38  
 Villa-joyosa, 55  
 Vigo, 51  
 Villa Franca point, 59  
 Villano cape, 51  
 Villaricos, 54  
 Villaviciosa, 50  
 Villequier, 44  
 Vinaroz, 55  
 Vincent, Gulf of St., 86  
 " St. (West Indies), 120  
 Vineyard sound, light vessel, 104  
 Vito, cape St., Sicily, 64  
 Voloiskaia spit, 71  
 Vlieland, 22  
 Vollerwick, 26  
 Volo, gulf of, 67  
 Vordingborg, 29  
 Vulcano island, 64  
 Waakaack, (beacon, *White*), 107  
 Wade point, *White*, screw pile, 113  
 Walde point, 45  
 Walderhoug, 38  
 Walney island, stone, 13  
 Wangeroog, *White*, 25  
 Warkworth, 7  
 Warnemünde, 31  
 Warner, light vessel, *Red*, 3  
 Warrnambool, 37  
 Warwick, U.S., *White*, 105  
 Washington fort, U.S., *White*, 112  
 Watch Hill, granite, 105  
 Waterford, 17  
 Watt's island, *White*, 111  
 Watchet, 16  
 West point, Anticosti, *White*, 93  
 " Hudson river, *White*, 108  
 Werder, 32  
 West Cappel, 21  
 West Girdler, light vessel, *Red*, 4  
 West Hinder, light vessel, 21  
 Westport, U.S., 104  
 West Quoddy head, *White and Red*, 99  
 Weymouth, 2  
 Whale's back, *White*, 101  
 Whalsey Skerries, Shetlands, brick, *White*, 10  
 Whithy, (High Whithy), *White*, 6, 7  
 Whitehaven, 13  
 Whitehead island, Penobscot bay, *Grey*, 100  
 Whitehead island, Nova Scotia, *White*, 97

- White island, Isle of Shoals, *White*, 101  
 „ „ shoal, James river, *White*, screw pile, 110  
 Whitton Ness, 6 and 120  
 Wicklow, *White*, 17  
 Widow island, 99  
 Wick, Scotland, 9  
 Wickham, cape, *White*, 85  
 Wigwam point, Annisquam, *White*, 101  
 Willemstad, 23  
 Willoughby spit (Chesapeake bay), light vessel,  
*Red*, 110  
 Willoughby, cape, 86  
 Wilson promontory, *White*, 83  
 Windmill point, light vessel, *Straw*, 111  
 Wing's neck, Sandwich, U.S., *White*, 104  
 Winga or Vinga island, 28  
 Winter harbour, *White*, 99  
 Winterton, *Red*, 6
- Wolf island (beacons, *White*), 115  
 „ „ rock, 1  
 Wolftrap shoals, *Lead*, 111  
 Wood island, *White*, 101  
 Woodside ferry, 14  
 Workington, tide lights, 12  
 Wormsø, circular, *White*, 32 and 129  
 Worthing pier, 3  
 Wrath, cape, *White*, 10  
 Wyro river, 13
- Xagua, Cuba, 121
- Yafa, 73  
 Yang-tse-kiang, 85  
 Yarmouth, Norfolk, 5  
 „ „ Isle of Wight, 2
- Yarmouth, Nova Scotia, 98  
 Yedo gulf, 85  
 Yenj-Kaleh, 72  
 York spit, light vessel, *Yellow*, 111  
 Youghal, 17  
 Ystad, 35  
 Yung river, 85
- Zafarana point, Red Sea, *Stone*, 79  
 Zandvoort, 22  
 Zante island, 67  
 Zea, 67  
 Zebu port, 84  
 Zeitin Burnu, 70  
 Zierikzee, 23  
 Zijpe, 23  
 Zuider Zee, 23

## BEACONS AND BUOYS ON THE COAST OF FRANCE.

---

THE French Light Lists for 1866 contain a Notice respecting all Beacons and Buoys established on the Coast of France, of which the following is a summary:—

On the French coast all buoys and beacons painted *red* with a *white* band near the summit must be left to starboard; those painted *black* to port, on entering a channel from sea; and those which can be passed on either side are coloured *red with black horizontal bands*. That part of the beacon *below the level of high water* and all warning buoys are coloured *white*. The small rocky heads in frequented channels are coloured in the same way as the beacons, when they have a surface sufficiently conspicuous.

Each beacon or buoy has upon it, either in full length or in abbreviation, the name of the danger it is meant to distinguish, likewise its number, commencing from seaward, and thus showing its numerical order in the same channel. The *even* numbers are on the *red* buoys, and the *odd* numbers on the *black* buoys; the buoys and beacons coloured *red with black horizontal bands* are named, not numbered.

The letters and numbers are painted in *white* on the most prominent parts of the buoys, and from 10 to 12 inches in length. The masts of the beacons which do not present sufficient surface are surmounted for this purpose by a small board. All the jetty heads and turrets are coloured above the half-tide level, and on the former a scale of metres is marked commencing from the same level.

PART II.

---

TIDE HOURS

OF THE

PORTS AND HARBOURS OF THE WORLD.

shed on the

must be left  
unbe passed  
*level of high*  
are coloured

danger it is  
merical order  
buoys; the

d from 10 to  
mounted for  
level, and ou

Ab  
Ab  
Ab  
Ab  
Ab  
Ab  
Ab  
Ab  
Ab  
Ab  
Ab  
Aca  
Aca  
Acl  
Acl  
Ada  
Ada  
Ada  
Ado  
Ado  
Ado  
Ado  
Ado  
Ado  
Adv  
Adv  
Z  
Z  
Agar  
Agar  
Agg  
Agg  
Agg  
Agg  
Air  
Aix  
Aix  
Akar  
Akar  
Akar  
Akar  
Al  
Al  
Al  
Al  
Al

## TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

PLACE.	High Water, Full and Change.		Rise.		PLACE.	High Water, Full and Change.		Rise.		PLACE.	High Water, Full and Change.		Rise.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Abaco, Bahamas . . . . .	8 0	3			Albemarle Id., Galapagos	2 0	6			Annapolis, United States	4 38	1	1	
Abbey Head, England . . . . .	11 10	23	17½		— Port, Falkland					Aune, St., B., Cape Breton	8 34	6	4½	
Abd-ul-Kuri, Indian Ocn.	8 30	6			Islands . . . . .	7 15	7			Annisquam, United States	11 0	10½	9	
Aberdeen, Scotland . . . . .	1 0	12	10		Albert River (Kangaroo					Anno Bom Id., Africa . . . . .	3 45	5		
Aberdeveay, Wales . . . . .	8 0	15			Point), Australia, N.					Anticosti Id., G. St. Law-				
Aberwrach, France . . . . .	4 14	22	16		Coast . . . . .	7 30	10-13	3-8		rence, East Cape . . . . .	1 0	5	3	
Aberystwyth, Wales . . . . .	7 31	13½	10		Aldabra Ids., Mozambique	5 0	10			— Bear Bay . . . . .	1 10	5	3	
Abrolhos, Brazil . . . . .	3 20	6-7			Aldborough, England . . . . .	10 45	8½	6½		— West Point . . . . .	2 0	6	4	
Abtao I., Patagonia, W.C.	0 50	18			Alderney, English Chan.	6 46	17	12½		Antigonish Harb., R. St.				
Abu-shehr, Persian Gulf	7 30	7			Alert Bay, Cormorant					Lawrence . . . . .	9 0	4	2	
Acajutla, Cent. America . . . . .	2 25	9			Id., Johnstone Strait,					Antigua Island (English				
Acapulco, Mexico, W. Co.	3 6	1½			Vancouver Island . . . . .			15		Har.), Caribbean Sea			2	
Acheen Head, Sumatra . . . . .	8 45	8			Alexander Port, Africa,					Antungil Bay (Port Choi-				
Achillbeg, Ireland . . . . .	5 14	10½	8		S.W. Coast . . . . .	3 0	5			seul), Madagascar . . . . .	4 0	5		
Adam Bay, Australia, N.					Algeciras, Spain . . . . .	1 49	4	2½		Antonio Cape, St., Cuba			1½	
Coast . . . . .	6 0	18			Algon B., Africa, S. Co.	4 0	4-5			Antonio, St., Port, Pata-	10 40	28		
Adams Port (Mary Id.),					Alligator Rvr., Australia,					gonia, E. Coast . . . . .				
Yellow Sea . . . . .	2 0	10			N. Coast . . . . .	8 15	15			Antonio, St., Port, Ma-	12 0	7		
Adelaide Port, Australia,					Alloa, Firth of Forth,					gellan Strait . . . . .				
S. Coast . . . . .	5 44	6			Scotland . . . . .	3 18	17½	15		Antrobus Id., G. St. Law-				
Adon and Adjacent Bays,	{ 7 30 to	{ 6			Altona Germany . . . . .	5 19	7			rence . . . . .	10 30	5	3	
Arabia, S.E. Coast . . . . .	{ 9 30	{ 7	4½		Amboyna, Moluccas . . . . .	0 33	7			Antwerp, Belgium . . . . .	4 25	15		
Adenara, Flores, Malay					Ameland Gat, Netherlands	9 0	7			Aor Pulo, Sumatra, N.E.				
Archipelago . . . . .			8		— Hollar Road . . . . .	11 30	7			Coast . . . . .			5	
Admiralty G., Australia,					Amet Sound, Nova Scotia	10 30	8	5		Aotea Har., New Zealand	10 0	12	9½	
N.W. Coast . . . . .	12 0				Amirante I-les (St. Joseph					Apalachicola B., Gulf of				
Adolphus Id., Australia,					Id.), Indian Ocean . . . . .	5 0	8½			Mexico . . . . .			2½-4	
N.W. Coast . . . . .	7 30	21			Amlwch, Wales . . . . .	10 30	18½	13½		Appetetat B., Gulf St.				
Adou Atoll, Maldives . . . . .	1 0	4			Amoy (Inner Harbour),					Lawrence . . . . .	11 10	5½	3½	
Adou Matte Atoll, Mal-					China, E. Coast . . . . .	12 0	18½	14½		Appin Port (Loche				
dives . . . . .	3 0	4			Ampanam B., Lombok . . . . .	8 0	6			Linnhe), Scotland . . . . .	5 26	12½	8½	
Adventure Cove, Tierra					Amsterdam, Indian Ocean	11 0	3			Appledore, England . . . . .	5 28	23	16½	
del Fuego . . . . .	3 10	4			Amulgawein, Persian G.	11 40	6			Aquin Bay, St. Domingo	irr.	2-3½		
Port, New					Amur Strait, Gulf of					Aracan R. (Bar), Bay of				
Zealand . . . . .	12 20	8	C		Tartary . . . . .	11 40	5-6			Bengal, E. Coast . . . . .	9 45	9	6	
— Sound, Falk-					Andaman Ids., Port Blair,					Aracati, Brazil . . . . .	6 0	8	6	
land Islands . . . . .	5 30	5½			Indian Ocean . . . . .	10 0	9	6		Araish El, Africa, N.C. . . . .	1 30	9-12		
Agadir, or Santa Cruz,					— Port Cornwallis	10 0	8½			Arasaig, Scotland . . . . .	5 50	13½	10	
Africa . . . . .	12 45	9			Strait, Indian					Arauco Bay, Chile . . . . .	10 15	6		
Aggerinde, Jutland . . . . .	4 9	2			Ocean . . . . .	10 24	9½			Arbroath, Scotland . . . . .	1 35	14	11	
Agnes, St., Scilly Isles . . . . .	4 30	16			Andrava Bay, Mada-					Arcechou, France . . . . .	4 37	11½	9½	
Aguada Pnt., Hindostan,					gasear . . . . .	3 30	7			Arcaas Rocks, G. of Mexico	noon.	1½		
W. Coast . . . . .	10 30	9			Andres, San, B., Pata-					Arclglass, Ireland . . . . .	11 0	16	12	
Agulhas Cape, Africa, S.					gonia, W. Coast . . . . .	0 45	5			Ardintallan, Loch Feo-				
Coast . . . . .	2 50	5			Andrews, St., Bay, G.					chan, Scotland . . . . .	5 31	9	6½	
Air Pt., R. Dee, England	10 54	25	19		of Mexico . . . . .	irr.	1-2			Ardriahag, Loch Fyne . . . . .	11 53	9	7½	
Aix, Ile d', Charente R.,					Angada, Virgin Islands.	9 0	1½			Ardrossan, Scotland . . . . .	11 45	10	8	
France . . . . .	3 20	17	12½		Anaetum, Iuyang, S.					Arenas Point, San Carlos,				
Akaroa Harb., New Zea-					Pacific . . . . .	6 35	4			Patagonia, W. Coast . . . . .	0 14	6		
land . . . . .	3 24	8	6		Angoxa Riv., Africa, E.C.					Argyle, Bay of Fundy . . . . .	9 27	12½	10½	
Akasi, Japan Sea . . . . .	6 36	6½			Augra, Azores . . . . .	12 32	4½			Arica Road, Peru . . . . .	8 0	5		
Akyab, Aracan R., Bay					— Bank, Hindostan,					Arichat, Nova Scotia . . . . .	8 10	5	4	
of Bengal . . . . .	9 45	9	6		W. Coast . . . . .	10 30	9			Arinagour, Coll Island,				
Al Bidd, Persian Gulf . . . . .	8 30	6½			— Pequena, Africa,					Scotland, W. Coast . . . . .	5 39	12½	9½	
Alabat Harbour, Luzon . . . . .	10 0	9			S.W. Coast . . . . .	2 30	8			Arkhangel, White Sea . . . . .	7 28	2½		
Alan Id., Patagonia, W.C.	0 31	18			Anna Pink B., Patagonia,					Arklow, Ireland . . . . .	8 45	4	3	
Albany Ids. (Port Albany),					W. Coast . . . . .	0 45	5			Arnhem B., Australia,				
Australia, E. Coast . . . . .	12 15	10	7		Annan Foot, England . . . . .	11 56	20	14		N.C. . . . .	8 10	6		

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Arroa, Malacca Strait		10			Ballycotton, Ireland	4 54	12	0½		Bas, He de, France	4 49	23		17
Arthur Port, Tasmania	7 52	4			Ballyerovane, Kenmare River, Ireland	3 42	10½	7½		Basiléh, Persian Gulf	12 0	10		
Arundel, England (Har.)	12 25		11½		Ballynakill Bay, Ireland	4 40	12½	9½		Basil Bay, Korea, W.C.	4 15	18		10
Asaph, St. H., Australia, N. Coast	5 45	14			Ballyness (Bar), Ireland	5 22	11½	8½		Basque Port, Newfoundland	8 55	5½		3½
Ascension Id., S. Atlantic	5 30	2			Ballysadaro (Quay), Ireland	6 0	8½	5½		Basrah (Bar), Persian Gulf	12 0			
Askaig Port, Islay	4 58	6½	4		Ballyshannon (Bar)	5 18	11½	8½		Basrah (Bar), Persian Gulf	12 0			
Astoria, Oregon	0 42	7½	6		Ballyweel, Ireland	5 23	12½	8		Bassin R., Bay of Bengal	10 0	9		6
Atacames Bay, Ecuador	3 37	13			Balta, Scotland	9 45	6	4½		Batanes, Bashee Islands, China Sea, E. Coast				4
Atchafalay Bay, Gulf of Mexico	irr.	2-2½			Baltimore, Ireland	4 23	10½	8½		Batavia, Java	10 0	2		
Athline, Loch Seaforth	6 16	15	10		United States	6 33	1½	1½		Batehian, Gilolo, Moluccas	1 0	6		
Atico Road, Peru	8 53	5			Banana Ids., Africa, W.C.	8 15	9			Bate (Gulf of Cutch), Hindostan, W. Coast	12 20	12		8
Auckland Harb., New Zealand, N. Island	7 5	11	9		Bangoot R. (entrance), Hindostan, W. Coast	2 0	12			Bathurst, G. St. Lawrence	3 15	7		4
Augustine, St., United States	8 21	5	4		Banda, Moluccas	4 0	6	6		Batz, Netherlands	3 15	15		
St. B., Madagascar, W. Coast	4 30	13			Bander Aléeb, G. of Aden	6 45	6			Batiscan, R. St. Lawrence	9 48	3½		2
Autezavick Sound, Labrador		5			Bander Gort, Gulf of Aden	8 45				Batticaloa River, Ceylon	5 0	2-3		
Aux Cayes Bay, St. Domingo	irr.	2-3			Shabab, Ind. Ocean	7 0	7			Bawdsey Haven (see Woodbridge Haven)				
Avacha B., Kamchatka	3 30	6½	4½		S. E. Coast	10 0	8½			Bay of Harbours, Falkland Islands	6 0	5		
Avon Isles, Australia, E.C.	8 30	5			Banff, Scotland	0 28	10½	8		Bay of Islands (Motu Mea Isl.), New Zealand	7 15	9		6
Avon River, Higbury Bay, England	5 47	16½	11½		Bantam, Java		5			Bay of Mercy, Banks Land		2		
Awassina (Inland Sea), Japan	0 14	7			Bantry Harb., Ireland	3 47	10	7½		Bayonne (Bar), France	3 45	12		10
Awanui R., New Zealand	7 43	7			Baracoa, Cuba	7 23	2½			Bazaruto Cape, Africa, E.C.	4 15	10		
Axim, Africa, W. Coast	4 30	4			Barataria Bay, Gulf of Mexico	irr.	1½			Beachy Head, England	11 20	20		15
Aylen Bay, Yellow Sea	2 30	6	4		Barbados, Carribbee Ids.	irr.	2			Beagle Bay, Australia, W. Coast	11 30	13-15		
Aynaun, Persian Gulf	11 20	6			Barbara Port, Patagonia, W. Coast	12 23	6	4		Bear Cape, Prince Edward Island	9 0	6		3
Ayr, Scotland	11 50	8½	7½		I. Santa, California	8 0	3½			Bear Head, C. Breton Id.	8 30	4½		3
Point of, I. of Man.	11 7	20½	16½		Barbe St., Sumatra, N.E. Coast	6 0	6			Beaubère Id., Gulf St. Lawrence	6 30	6		4
Bab-el-Mandeb, Gulf of Aden	12 0	7			Sta. Id., California	8 0	3½			Beaufort, United States	7 26	3½		2½
Bachelor River, Magellan Strait	1 40	5			Barclay Sound (Island Harbour), Vancouver Island	12 0	12			Beaulieu, England	10 25 } 10 } 8½ } 12 15 } 10 }			
Bacuit B., China Sea, E.C.	10 0	6			Uchucklesit Harbour, Vancouver Id.		12			Beaumaris, Wales	10 32	21½		16½
Badas Id., Linga Bay, Sumatra	6 0 PM	12			Bardsey Id., Wales	7 40	15			Beaver Cove, Vancouver Island		15		
Badong B. (S. Cst.), Baly Bagroo River, Sherbro River, Africa	11 0	9½			Barfleur, France	8 51	17	13½		Creek, Loughborough Inlet, B. Columbia	3 0	16		11½
Bahia, Brazil	4 15	8			Barmouth, Wales	7 41	17	13½		Barcouer Island, Vancouver	0 30	15½		
Bahrein, Persian Gulf	5 30	7			Barnstable, United States	11 22	10	8½		Nova Scotia	7 40	6½		4½
Balabac Id., China Sea, E. Coast	11 0	5			Barnstable Bar, England	5 30	19	14		Bedeque Harbour, Prince Edward Island	10 15	7		5
Balade Harb., New Caledonia	6 30	4½			Barnstable Bridge, England	6 28	10½	7½		Bedford Bay, Terra del Fuego	0 30	7½		
Balambangan Id., Borneo, N. Coast	10 0	6-8			Barquero (entrance), Spain, N. Coast	3 0	15			Behring Bay, America, N.W. Coast	6 30	9		
Balasore R., B. of Bengal, W. Coast	10 0	15			Barra, Id. (North Harbour), Scotland, W.C.	5 48	11½	8½		Belfast, Ireland	10 43	9½		8
Balbriggan, Ireland	10 40	11			Castle Bay, Scotland, W.C.	5 44	11½	8½		Belgrano Port, La Plata	6 0	12		10
Bald Head, United States	7 26	5	4½		Barracouta Harb., G. of Tartary	10 0	3½			Bell Sound, Spitzbergen	8 50	3½		
Balachulish (Loch Leven, Scotland)	5 43	11			Barrang Bay, Rio de la Plata	7 0	5 9			Belles Amour B., Labrador	9 0	4½		2½
Ballinacourty, Dungarvan, Ireland	5 12	12½	9½		Barren Id., China Sea, E. Coast	9 30	5½			Belligam Bay, Ceylon	2 20	2½		
Ballinskellig Bay, Ireland	3 40	12	7½		Barren Ids., Madagascar	4 45	12			Bellona Reefs (Middle), Australia, E. Coast	8 30	6		
Ballycastle B., Ireland	6 25	3	2		Barrow Harbour, Newfoundland	7 10	5			Bembatooka Bay, Madagascar, W. Coast	4 30	16		
					Barry Id., Wales	6 39	35½	26						
					Barton Port (Bubon Point), China Sea, E.C.	10 55	6							

TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.	RISE.	PLACE.	High Water, Full and Change.	RISE.	PLACE.	High Water, Full and Change.	RISE.	
H. M.	ft.	Sigs.	Nps.										H. M.
11 0	11			Bembridge Pt., England.	11 0	14	Blair Harb., China Sea.	11 0	14	Bowling, R. Clyde, Scot. Land.	0 39	9	
4 49	23			Bonleuca, Scotland . . .	6 3	11½	W. Coast . . .	8 50	9	Boyama B., Madagascar, W. Coast . . .	4 30	15	
12 0	10		10	Beneoolen, Sumatra . . .	0 0	3-5	Blakeuey, England . . .	6 30	15	Bradore Bay, Labrador . . .	8 45	4	
4 15	18			Benevente, Brazil . . .	3 0	5	(Bar) . . .	6 30	15	Brads Harbour, New Zealand . . .	7 0	2 3/4	
8 55	5½	3½		Bonguela, Africa, W. Co.	2 30	5 1/2	Blanche Port, Strosky Bay, Australia, S. Co.	1 0	5	Brantle Cay, Torres Strait . . .	9 15	12	
12 0				Bonin R., Africa, W. Co.	4 30	7	Blanco Cape, Africa, W. Coast . . .	11 46	4	Brandy Pota, River St. Lawrence . . .	3 0	17	
0 0	9 1/2		6	Benton Castle, Cloddan River, Wales . . .	6 23	20	Blankenberg, Belgium . . .	12 48	13	Brass River, Africa . . .	4 0	6	
10 0	4			Berberoh or Barburra (Gulf of Aden) Africa, E. Coast . . .	7 15	9	Blas, San, Mexico, W. Coast . . .	9 41	6½	Brava, Africa, E. Coast . . .	4 30	8	
1 0	6			Berbeco, Guayana . . .	4 30	11 7/8	La Plata . . .	2 0	12	Bray Head, Ireland . . .	10 15	12	
12 20	12	8		Bergen, Norway . . .	1 30	4	Blasket Islands, Ireland . . .	3 30	11½	Bray Head, Ireland . . .	10 15	12	
3 15	7	1		Berkeley Sound, Falkland Islands . . .	5 0	7	Blewfields, Mosquito Cal. . .	1 50	2	Brazos River, Gulf of Mexico . . .	ur.	1½	
3 15	15			Bermudas: Ireland Id., N. Atlantic . . .	7 14	4	Bligh Sound, New Zealand . . .	10 15	8	Bréhat, France . . .	5 51	31	
9 48	3½	2		Bernera, Loch Roag, Lewis Id. . . .	6 11	11	Blind Bay, Nova Scotia . . .	7 46	7½	Brest, France . . .	3 47	19	
5 0	2-3			Berneray I., Sound of Harris . . .	6 11	13	Block Id., United States . . .	7 36	3½	Bridgeport, United States . . .	11 11	8	
6 0	5			Bersiap Point, Banka Strait . . .	6 30	12	Bluff Cay, Bahamas . . .	7 0	4½	Bridgewater (Bar), England . . .	0 50	35	
7 15	9	6		Bersimis R., Gulf St. Lawrence . . .	2 0	12	Blunden Harbour, Brit. Columbia . . .	12 0	16	Bridlington, England . . .	1 39	16	
3 45	12	10		Berwick, Scotland . . .	2 18	15	Blyth, England . . .	3 15	15	Bridport, England . . .	0 5	11½	
4 15	10			Bethelween Harb., G. St. Lawrence . . .	11 32	5	R., Southwold, England . . .	10 20	6½	Brielle, Netherlands . . .	3 0	5	
11 20	20	15		Beypoor R. (entrance), Hindostan, W. Coast . . .	0 15	5	Boea de Varadero, Cuba . . .	8 39	2	Brighton, England . . .	11 15	19½	
11 30	13-15			Bias Bay (Pooniang Id.), China, E. Coast . . .	8 0		Bodega Port, California . . .	11 17	4½	Bristol (King Road) England . . .	0 56	11	
9 0	6	3		— (Tsangchow Id.), China, E. Coast . . .	8 30		Boikín Light, United States . . .	5 42	1½	Britannia Bay, Sumbawa Island, S. Coast . . .	1 0	11 1/2	
8 30	4½	3		Bie Id., G. St. Lawrence . . .	2 15	11	Bolajor Cape, Africa . . .	12 0	8½	British Sound, Madagascor, E. Coast . . .	4 6	9½	
6 30	6	4		Biddah R., B. of Bengal, W. Coast . . .	10 0	14	Bolt Head, England . . .	5 15	15½	Broad Sound Australia, E. Coast . . .	11 0	20 3/4	
7 26	3½	2½		Bileford, England . . .	6 7	16	Bombay Dockyard, Hindostan, W. Coast . . .	11 49	12 1/2	Broadhaven Har., Ireland . . .	5 0	10½	
12 15	10	8½		Bijouga Islands, Arcas Channel, Africa, W. Co.	10 10	11 14	Bonacca Id., Bay of Honduras . . .	9 0	1½	Broadway R. (entrance), China, E. Coast . . .	11 0	7½	
10 32	21½	16½		— Bissao, Africa, W. Coast . . .	11 0	8	Bonanza, Spain . . .	2 0	12½	Broken Bay, Australia, E. Coast . . .	8 0	6 9	
3 0	16	11½		— Orango Channel, Africa, W. Co.	10 0	11	Bonne Esperance Harb., G. of St. Lawrence . . .	9 15	5	Broom Loch (Chilapool) . . .	6 40	14½	
0 30	15½	4½		Bilbao (Bar), Spain . . .	3 0	13	Bonny R. Co., Africa, W. Coast . . .	5 0	9	Broughty Ferry, Scotland . . .	2 22	14½	
7 40	6½	4½		(Town), " . . .	3 20	9	Booby Island, Australia, N. Coast . . .	4 30	8	Brouwershaven, Netherlands . . .	2 15	19	
0 30	15½	4½		Biboxi, G. of Mexico . . .	irr.	2	Bordeaux, France . . .	6 50	14	Bruit River, Borneo . . .	3 0	11	
10 15	7	5		Bina Bay, Sumbawa . . .	Noon.	6	Borja B., Magellan Strait . . .	1 59	6½	Bruni R., China Sea, E. Coast . . .	14 0	12	
0 30	7½			Binkanz B., China Sea, W. Coast . . .	11 30	5	Borkum (Road) Germany . . .	10 30	8-10	Brunsbüttel, Germany . . .	1 58	9	
10 43	9½	8		Binnic, France . . .	6 3	30	Boscaille, England . . .	5 15	25	Brunswick B., Australia, N.W. Coast . . .	12 0	24	
6 0	12	10		Bintula R., China Sea, E. Coast . . .	5 45	6	Boston (Sluice), England . . .	7 0	12	Brush, Yarmouth, England . . .	5½	4½	
8 56	3½	2½		Bird Island, China Sea, E. Coast . . .	9 30	6	— Desp (Clay Hole) . . .	— Hob Hole . . .	21½	17	Bubon Point, Port Barton, China Sea, E. Coast . . .	19 55	6
9 0	4½	2½		— Ids., Africa, S. Coast . . .	4 0	4 5	— Light, U.S. . . .	11 27	11½	Buchene River, G. St. Lawrence . . .	3 20½	4½	
2 20	2½			Blavand Point, Jutland . . .	1 44	5	Botany Bay, Australia, E. Coast . . .	8 15	7 8	Budhaven, England . . .	5 45	23	
8 30	6			Black Ball Harb., Ireland . . .	3 49	9½	Boteler R., Madagascar . . .	4 39	15	Buenos Ayres, S. America, E. Coast . . .	12 0	3 5	
4 30	16			— Rock, Bay of Fundy . . .	11 29	35	Boucaut, France . . .	3 39	8½	Buffalo R. (entrance), Africa, S. Coast . . .	3 45	4½	
				Blacksof Bay (Quay), Ireland . . .	4 47	19	Boughton Harb., Prince Edward Island . . .	3 49	5	Bulama Island (Arcas Channel), Africa, W. Coast . . .	19 10	14	
				Blacktoft, River Humber . . .	6 59	16	Boulogne, France . . .	11 25	25				
							Bourbon Id., Indian Oc., see Reunion Id. . .	1 6	6				
							Bours (Cajeli Bay) Mozambique . . .	2 49	3				
							Bow Island, S. Pacific . . .	9 35	16				
							Bowen Port, Australia, E. Coast . . .						



## TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Bull Harbour, Goletas Channel, Vancouver Island	0 30	12½			Calf Sound, Isle of Man	11 17	10½	13		Carleton Point, Gulf St. Lawrence	3 0	6	4	
Bull Island, Newfoundland	7 22	3½	2		Callout Roads, Hindostan, W. Coast	0 15	5			Carlingford (Bar or Cranfield Point), Ireland	11 0	14	11	
Bulls Island Bay, U.S.	7 16	5½	4½		Callao Bay, Peru	5 47	4			Carlisle Port, England	12 10	20	14	
Bulls Mouth (Achill Sound N. entrance), Ireland	5 38	10¾	7½		Calshot (Castle Pt.), England	11 30	13	9½		Carlos, San, Port, Patagonia, W. Coast	11 15	6		
Bulsaur R., Hindostan, W. Coast	1 45	18			Calstock, R. Tamar, England	6 6	12½	8½		(Arenas Point) Patagonia, W. Coast	0 14	6		
Bulagan O'sta Ana Port, Filipinas	12 0	5½			Camaguin, Babuyan, Ids.	6 0	6			(English Bank) Patagonia, W. Coast	0 4			
Bunawe (Loch Etive), Scotland	7 54	5¾			Camarinas Port, Spain	3 0	15			Carlos, San, Port, Falkland Islands	7 0	8		
Buncrana, Ireland	5 40	16			Cambay, Hindostan, W. Coast	5 20	28			Carnot Bay, Australia, W. Coast	0 30	13-14		
Bunessan, Scotland	5 24	12	8½		Cambing, Banda Sea	noon	6			Carouge River, R. St. Lawrence	7 15	16	11	
Burburra, see Berbereh.					Camden Harb., Australia, N. W. Coast	11 30	30			Carrigaholt, Ireland	4 44	14	10½	
Burin Harbour, Newfoundland	8 45	6½	4½		Cameleon Harb., Nodales Channel, B. Columbia	3 0	16	11½		Carsaig, Scotland	5 28	10	7½	
Burntisland, Firth of Forth, Scotland	2 24	16½	12¾		Cameroon R., Africa, W. Coast	4 0	6			Cartagena, New Granada	11 0	1½	1	
Burnt Isles, Kyles of Bute, Scotland	11 50	10	8		Campbell Cape, New Zealand	6 0	8	6		Carteret, France	6 25	31	22½	
Burong I., China Sea	4 45	7			Island, South Pacific	12 0	43½			Port, New Ireland		6		
Burrard Inlet, Gulf of Georgia, B. Columbia	6 0	16			Town, Gulf St. Lawrence	4 0	10	7		Carwar or Sedashigur Bay, Hindostan, W. Coast	9 30	7-8		
Burry Port, Wales	6 1	25½	18½		Campbellton, Scotland	11 45	8½	6		Cascumpeque H., Prince Edward Island	5 40	3	2	
Bushire, see Abu-shehr.					Campeche, Yucatan	1 45	2½	2		Cashla Bay, Ireland	4 53	16	12	
Bussorah R. Bar, Persian Gulf	12 0				Campobello (Welchpool), B. of Fundy	11 21	23½	20		Casquets, English Channel	6 45	15½		
Busuanga, Burias Island.	12 30	6			Cancale, France	6 20	37	27		Castillos, Cape, Rio de la Plata	8 30	2		
Button Islands, Hudson Strait	6 50				Canna Id., Scotland, W. Coast	6 19	14	9½		Castlereagh Cape, Tierra del Fuego	2 50	4		
Byron Bay, Australia, E. Coast	9 45	6			Canso Gut (Plaister Cove), Nova Scotia	9 10	4½	3		Castletown, Bearhaven, Ireland	4 14	9¾	7½	
— Cape, Australia, E. Coast	9 45	6			Island Har., C. Breton	7 48	6½	4½		Isle of Man	11 10	20	16	
Cabita Bay, New Granada	3 40	12			Cantin Cape, Africa	10 0	10			Castletownsend, Ireland	4 21	10¾	8	
Cacheo River, Africa, W. Coast	7 45	8			Canton River (entrance), China	10 0	8			Castries B., G. of Tartary	10 30	6		
Cadiz, Spain	1 45	9½			Canton River } In Mar.	2 40	5½			Castro, Patagonia, W. C.	0 11	18		
Caen, France	10 57				— " } In May	1 40	5½			Casuarina Point, China Sea, E. Coast	9 30	6½		
Caermartien (Bar)	6 10	26	19½		— " } & June	1 40	5½			Catalina Harbour, Newfoundland	7 0	6	4	
Caernarvon, Wales	9 33	12¾	10½		Cape Coast Castle, Africa, W. Coast	4 30	6			Catharina Sta. I., Brazil	2 45	6	4½	
Caimites, St. Domingo	8 0	1			Cape May Landing, U. States	8 19	6	5		Cato Bank, Australia, E. Coast	8 0	6		
Cairnrough, Ireland	10 51	5½	5		Caracas River, Ecuador	3 30	10			Catoche Cape, Yucatan	9 30	1½		
Cajeli Bay, Bouro	1 6	6			Carquette Harbour, G. St. Lawrence	2 40	6	3		Cattawade Bridge, Stour River, England	1 8	4		
Calais, France	11 49	19½	15½		Cardiff, Wales	6 59	38	29		Cavalli Ids., New Zealand	8 0	7		
Calhuco Beach, Patagonia, W. Coast	1 15	16			Cardigan, Wales	7 1	12	9		Cavern Island, China Sea, E. Coast	9 30	5½		
Calcasien Fort, Patagonia, W. Coast	1 18				Bay, Prince Edward Island	8 40	5	3½		Cawee Islands, Gulf St. Lawrence	1 50	9	5	
— River, Gulf of Mexico	0 47	18			Careening Bay, Australia, N. W. Coast	11 45	30			Cay West, United States	9 30	1½	1½	
Calcutta, Bengal	2 30	2½	1½		Caremapu, Patagonia, W. Coast	0 50	10			— N. W. Channel, U.S.	9 10	1½	1½	
Caldy Island, Bristol Channel	6 0	24½	16½		Cargados Carajos Shoals, Indian Ocean	2 0	4			Cayenne, Guayana	3 45	6-11		
Calabar R., Africa, W. Coast	5 0	9			Cardigan Bay, Prince Edward Island	8 40	5	3½		Cayeux, France	11 5	27½	21	
Caledonia Harbour, New Granada	11 40	1½	1		Caribbean Bay, Tamar, England	5 47	14¾	10¾		Ceara, Brazil	4 30	9		
					Caribou Harbour, Nova Scotia	10 0	6	4		Cedar Cays, United States	0 51	3½	2½	
										Cedeira, Spain, N. Coast	3 0	15		
										Centre Id. (Foveaux St.) New Zealand	12 15	8	6	

TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

5\*

High Water, Full and Change.				RISE.				PLACE.	High Water, Full and Change.				RISE.				PLACE.	High Water, Full and Change.				RISE.												
H.	M.	ft.	ft.	Spgs.	Nps.	H.	M.		ft.	ft.	Spgs.	Nps.	H.	M.	ft.	ft.		Spgs.	Nps.	H.	M.	ft.	ft.	Spgs.	Nps.	H.	M.	ft.	ft.	Spgs.	Nps.			
3	0	6	4					Ceram, Wahaay Harbour, Moluccas	6	0	3					Chimney Id., Tees Pass, China, E. Coast	11	30	12					Cockburn Sound, Australia, W. Coast	9	0	1-1½							
11	0	14	11					Cerro Id., California	9	10	7-9					Chinchu Harb., China, E. Coast	12	25	17					Cockenzie, Firth of Forth, Scotland	2	16	15½	13						
12	10	20	14					Ceuta, Africa, N. Coast	2	6	3¾	½					Chin-see, Yung R., China, E. Coast	11	20	12½					Col Cape, United States, Cold Spring Inlet, United States	11	30	13						
11	15	6						Chacachacara Id., Trinidad, Caribbean Sea	3	30	4					Ching-tau Bay, Yellow Sea	6	0	12	9					Colarado River, La Plata	4	0	9	7½					
0	14	6						Chacao Bay, Patagonia, W. Coast	0	40	14					Chipiona, Spain	1	34	12½	8					Colarados, R. La Plata	3	40	11						
0	4							Narrows, Patagonia, W. Coast	1	15	16					Chittagong (Bar), Bay of Bengal, E. Coast	1	15	15	10					Cold Spring Inlet, United States	7	32	5½	4½					
7	0	3						Chalky Inlet, New Zealand	11	5	8	6					Chodo Id., Korea, W.C.	6	20	12					Coleraine, Ireland	6	24	6½	4					
0	30	13-14						Chalmers Port, America, N.W. Coast	1	0	13¾					Choiseul Port, Madagascar, E. Coast	4	0	5					Collier Bay, Australia, N.W. Coast	11	45	36							
7	15	16	11					Chamé Bay, New Granada	4	0	16					Chosan Harb., or Tsauliang-hai, Japan Sea	7	45	7	5					Colne Point, Colne River, England	12	0	14	10					
4	44	14	10½					Chamisso Id., America, N.W. Coast	4	42					Christchurch, England	9	0	5					Colombilla Cay, Pearl Cays, Caribbean Sea	2	0	2								
5	28	10	7½					Champion Bay, Australia, W. Coast	9	10	1					Christianstad, Santa Cruz	11	30	5					Colombo, Ceylon	1	0	2							
11	0	1½	1					Champlain R., St. Lawrence	9	45	3	2					Christmas Island, Indian Ocean	10	0	3					Colonsay (Schallasaig), Scotland, W. Coast	5	18	11	7½					
6	25	31	22½					Changchi Id., China, E. Coast	9	30	17					Christmas Harbour, Kerguelen Id.	2	0	2					Columbia River (entr.), America, W. Coast	0	15	7½							
		6						Changues Ids., Patagonia, W. Coast	0	35						Chuen-pee Point, Canton River	2	0	7¾					Compenoe River, Africa, W. Coast	10	0	15	11½						
9	30	7-8						Chapu Road, Hang-chu Bay, China, E. Coast	12	0	25					Chusan Archipelago, (Vernon Channel), China, E. Coast	9	40	14					Compu Inlet, Patagonia, W. Coast	1	10	17	13¾						
5	40	3	2					Charles Cape, U.S.	7	45	5					Chusan Tinghae, China, E. Coast	11	0	12	9					Condarcneau, France	3	12	13	9½					
4	33	16	12					Charles Id., Galapagos	2	10	6					Circular Head, Tasmania	11	40	9					Condore, Cochui China	3	0	4							
6	45	15½						Charleston, United States	7	26	6	5					Clara Point, B. of Fundy	8	27	8½	6½					Congo River, Africa, W. Coast	4	30	6					
8	30	2						Charlottetown, Prince Edward Island	10	45	9½	7					Clare Sta., I., Ecuador	4	0	11					Conquero Bay, Persian G.	7	45	9½						
2	50	4						Charlowka R., Lapland	8	8	12					Clare L., Ireland	4	38	12½	9½					Conil, Spain	1	18	11½	7½					
4	14	9¾	7½					Chateau Bay, Labrador	7	35	3½	1					Clarence Port, America, N.W. Coast	4	25							Conquet Road, France	3	46	21	15				
11	10	20	16					Chatam, England	1	2	17½	14					Clarence Harbour, Long Island, Bahamas	8	30	4	3½					Constitution Cove, Bolivia	10	0	4					
4	21	10¾	8					Id., Galapagos	2	23	6½					Clarke Harbour, Bay of Fundy	8	40	9½	7					Conway Cape, Australia, E. Coast	11	0	18						
10	30	6						Port, America, N.W. Coast	1	0	12					Clearwater Sound, Vancouver Island	12	0	12					Cook Harb., Newfoundland	7	25								
0	11	18						Chatte Cape, U.S.	12	0	13	8					Clear, Cape, Ireland	4	0	9	6½					Cooper Port, N. Zealand	3	50	7½	5½				
9	30	6¾						Chauan Bay, China, E. Coast	11	0	6½					Clearwater Point, Gulf St. Lawrence	11	30	5	3					Copiapo, Chile	8	30	5						
7	0	6	4					Chau-ey, Isles de France	6	9	25	26					Cleveland Bay, Australia, E. Coast	7	30	10-12					Coquet Road, England, E. Coast	3	0	14½	11					
2	45	6	4½					Cheduba, Bay of Bengal	11	30	8					Clev, England, N.E. Coast	5	5	5½					Coquimbo Bay, Chile	9	8	5							
8	0	6						Chee-fow Harb., Yellow Sea, see Chifu					Clifden Bay, Ireland, W. Coast	4	30	13½	10					Cordunay Lthse., France	3	37	13¾	10½								
9	30	1½						Chentabun River, China Sea, W. Coast	10	0	5½					Clonakilty Bay, Ireland	4	30	11	8½					Corentyn River, Guaviana	5	10	8½	6					
1	8	4						Chepo River, N. Granada	3	40	16					Coconacho Bay, G. of St. Lawrence	10	30	5	3					Coringa or Cocanada Bay, Bay of Bengal, W.C.	9	10	4-5	3					
8	0	7						Chepstow, England	7	30	38	23½					Cochin Harb. and Road, Hindostan, W. Coast	1	0	3½					Coringa R. (Bar), Bay of Bengal, W. Coast	9	0	5						
9	30	5½						Cherbaniani Reef, Laccadives, Indian Ocean	10	0	7	4					Cockburn Port, Africa, E. Coast	4	15	12					Corisco Bay (Elohey Isles), Africa, W. Cst.	5	0	7						
1	50	9	5					Cherbourg, France	7	49	17	12¾					Cochin Harb., Australia, N. Coast	5	45	24					Cork (Penrose Quay), Ireland	4	58	12¾	10					
9	10	1½	1½					Chesilton, England	6	13	10½	7					Cochin Harb., and Road, Hindostan, W. Coast	1	0	3½					Corn Id., B. of Honduras	1	45	2						
3	45	6-11						Chester (Crane Wharf), England	0	16	26					Cockburn Port, Africa, E. Coast	4	15	12					Corner Inlet, S. Australia	11	40	8							
11	5	27½	21					Chester River (Rockhall Creek), United States	5	23	2½	1					Cocagne River, G. St. Lawrence	7	30	4½	2½					Cornwall, Cape, England	4	35	18½	13½				
4	50	9						Chesterfield Islet, Australia, E. Coast	8	30	5					Coepach (Loch Aber), Scotland	5	59	11½					Corruna, Spain	3	0	15							
0	51	3½	2½					Cheticam, C. Breton Id.	8	15	3½					Corran (Loch Aber), Scotland	5	43	12	8½					Coudres Id. (Prairie Bay), R. St. Lawrence	4	25	17	10					
3	0	15						Chichester, England	11	30	14	11																						
12	15	8	6					Chifa, Yellow Sea	10	34	8	6½																						
								Chimino Bay, China, E. Coast	10	20	16																							

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Courseulles, France . . . . .	9 7	20	15½		Dalhousie Har., G. St.					Dielette, France . . . . .	6 40	27	20½	
Courtmacsherry, Ireland . . . . .	4 36	10½	8½		Lawrence . . . . .	3 10	9			Dieppe, France . . . . .	11 6	27	20½	
Coverack, England . . . . .	4 35	14½	11½		Dalkey Island, Ireland . . . . .	10 45	13	11		Digby Gut, B. of Fundy . . . . .	11 0	27½	23	
Cowes (West), England . . . . .	10 45	12½	9½		Dalrymple B., Madagascar, W. Coast . . . . .	5 0	15			Dillon Bay, Erromango Id., Banks Ids. . . . .	5 30	4		
Coy Inlet, Patagonia, E. Coast . . . . .	9 30	40			— Prt., Tasmania . . . . .	12 5	10	7½		Dingle, Ireland . . . . .	3 51	10½	7½	
Coyhuin River, Chile . . . . .	0 52	21			Damaun Bar, Hindostan, W. Coast . . . . .	1 30	17			Discovery Port, America, N. W. Coast . . . . .	2 30	7		
Cozumel, B. of Honduras . . . . .	8 30	1½			Dampier Strait, Moluccas . . . . .		11			Dislocation Harb., Tierra del Fuego . . . . .	1 40	4		
Crane Island, River St. Lawrence . . . . .	5 24	17	13		Danes Id., Spitzbergen . . . . .	0 24	5½			Diu Island, Hindostan, W. Coast . . . . .	2 0	6		
Cranford Bay, Mulroy Bay, Ireland . . . . .	8 3	4			Dannu R., Hindostan, W. Coast . . . . .	1 30	17			Dives, France . . . . .	9 39	21	16	
Crapaud, Prince Edward Island . . . . .	10 0	8	6		Darnley Id., Torres Strait . . . . .	9 30	12			Divy Pt., Bay of Bengal . . . . .		5		
Crichton Harbour, Korea, S. Coast . . . . .	9 50	11½	8½		Dartmouth, England . . . . .	6 16	14½	10½		Doboy Lighthouse, U.S. . . . .	7 33	7½	7	
Crimon Ids., Java Sea . . . . .	8 0	6	5		Darwin H., Choiseul Id., Falkland Islands . . . . .	6 30	5½			Dodandowe Bay, Ceylon . . . . .	1 50	1½		
Crinan, Scotland . . . . .	4 49	6½	5		Darwin Port, Australia, N. Coast . . . . .	5 30	17-24			Dodo R., Bight of Benin . . . . .	4 17	5		
Croce Har., Newfoundland . . . . .	6 30	4½			Dauphin Ft., Madagascar . . . . .	4 30	7			Domingo, San, Port, Patagonia, W. Coast . . . . .	12 0	7		
Croisilles Harbour, New Zealand . . . . .	9 0	12	8		De Roompot, North Sea . . . . .	12 30	12	8		Donaghadee, Ireland . . . . .	11 13	11½	9	
Cromarty, Scotland . . . . .	11 56	14	11		Deal, England . . . . .	11 15	16	12½		Donegal Har., Ireland . . . . .	5 18	11½	8½	
Cromer, England . . . . .	7 0	14½	11		Dealy Id., Melville Id. . . . .	1 48	4			Doris Cove, Tierra del Fuego . . . . .	3 0	4		
Crow Har., Nova Scotia . . . . .	8 0	6½	4½		Deep Harbour, Fife Sound, B. Columbic . . . . .	12 0	16	11½		Dornoch Road, Scotland . . . . .	11 47	11		
Crowdy Head, Australia, E. Coast . . . . .	9 15	5			— Point, Durian Strait . . . . .	5 0	10			Douany, Comoro Islands . . . . .	4 0	11-12		
Crooked Id., Bahamas . . . . .	7 6	2½			Deer Sound, Orkneys . . . . .	10 30	10	7½		Douglas, Isle of Man . . . . .	11 12	20½	16	
Crookhaven, Ireland . . . . .	4 9	9½	8		Delagoa Bay (Port Melville), Africa, S. Coast . . . . .	4 30	15			— Road, Bahamas . . . . .	8 30	4	2½	
Cucaco Bay, Patagonia, W. Coast . . . . .	12 0	6			Delagoa Bay (Portuguese Factory), Africa, S.C. — Shefen Id., Africa, S. Coast . . . . .	5 20	12			Dover, England . . . . .	11 12	18½	15	
Cuckolds Point, River Thames, England . . . . .	1 45	19½	15½		Delaware (Breakwater), United States . . . . .	8 0	4½	3½		Downham Reach, Orwell, England . . . . .	12 27	12		
Culdaff B., Ireland, W.C. . . . .	5 53	8½	6		Delftzel, Germany . . . . .	11 15	8-10			Dragons Mouth, Caribbean Sea . . . . .	3 0	4		
Culebra or Passage, Id., Caribbean Sea . . . . .	9 0	1			Delgado C., Africa, E.C. . . . .	4 0	16	11½		Drakes Bay, California . . . . .	11 41	4½	3½	
Cullen Harbour, Fife Sound, B. Columbia . . . . .	12 0	16	11½		Delhi River, Sumatra . . . . .	4 0	8			Drayton Harb., St. Juan de Fuca Strait . . . . .	2 0	12		
Cullin Id., Patagonia, W. Coast . . . . .		20			Demerara R., Guayana . . . . .	4 45	9	6		Drogheda (Bar), Ireland . . . . .	11 0	11½	9	
Culpepper Id., Galapagos . . . . .	?	?			Denham Sd., Sharks Bay, Australia, N. W. Cst. . . . .	12 5	5			Duart, Isle of Mull . . . . .	5 0	12	10	
Cumberland Basin (Saekville), Bay of Fundy . . . . .	11 55	45½	38		Denial Bay, Australia, S. Coast . . . . .	12 15	6			Dublin (Bar), Ireland . . . . .	11 12	12-14	9-11	
Cumsingnum Harbour, Canton River, China . . . . .	12 6	6½			Denison Port, Australia, E. Coast . . . . .	9 30	6			Dumbarton, Scotland . . . . .	0 20	9		
Cupehi Point, China, E.C. . . . .	8 0				Depuch Isle, Australia, W. Coast . . . . .	10 40	14			Dunbar, Scotland . . . . .	2 8	14½	11	
Cupica Bay, New Granada . . . . .	3 30	13			Desire Port, Patagonia, E. Coast . . . . .	12 10	18½			— Hindostan, W.C. . . . .	10 10	8		
Curieuse, Seychelles, Indian Ocean . . . . .	5 10	7			Devonport Dockyard, England . . . . .	5 43	15½	11½		Dunbeacon, Ireland . . . . .	3 51	10½	7½	
Curtis Port, Australia, E. Coast . . . . .	9 40	10-12			Dewgbur Harbour, Hindostan, W. Coast . . . . .	11 25	9			Duncan Bay, N. W. Cst. of America . . . . .	12 0	21		
Cuttyhunk, United States . . . . .	7 40	4½	3½		Diamond Island, Bay of Bengal . . . . .	10 30	8			Duncansby Ness, Scotland . . . . .	10 14	10	7	
Cutwell Harbour, Newfoundland . . . . .	7 0?	2-4?			— Point, Malacca Strait . . . . .	12 0	9½			Dundalk, Ireland . . . . .	10 56	13½	11½	
Cuxhaven, Germany . . . . .	1 8	10			Diego, San, Bay, California . . . . .	9 33	5	3½		Dundee, Scotland . . . . .	2 32	14½	11½	
Cuyler Har., California . . . . .	9 25	5	4		— Cape, Tierra del Fuego . . . . .	4 30	10			Dungeness, England . . . . .	10 45	21½	19	
Cypress Harbour, Sharp Passage, B. Columbia . . . . .	12 0	16	11½		del Fuego Garcia Island, Indian Ocean . . . . .	1 30	6			Dunk Island, Australia, E. Coast . . . . .	9 28	6-10		
Daggs Sound, N. Zealand . . . . .	11 30	8	6		— Ramirez Ids., Tierra del Fuego . . . . .	4 0	6			Dunkerque, France . . . . .	12 8	16½	13½	
Dahouet, France . . . . .	6 5	32	23½							Dunkerron, Kenmare R., Ireland . . . . .	3 45	10½	8	
Dalawan Bay, China Sea, E. Coast . . . . .	11 0	5								Dunmanus Har., Ireland . . . . .	3 57	9½	7½	
Dalcahue, Patagonia, W. Coast . . . . .	0 26									Dunmore, Ireland . . . . .	5 27	12½	9½	

TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

7\*

High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.	
H. M.	ft.	Spgs.	Nps.			H. M.	ft.			Spgs.	Nps.
6 40	27	20	23	East Point, Prince Edward Island	8 30	3	2	Espirito Santo, C. Magellan Strait	8 30	36-42	
11 6	27	20	23	Alligator R., Australia, N. Coast	8 15	15		Esquimalt, St. Juan de Fuca Strait*	irr.	7-10	5-8
11 0	27	20	23	Ecliptic Har., Labrador	6 32	31	22	Essington Port, Australia, N. Coast	3 24	13	
5 30	4			Echreous, France	6 32	31	22	Estevan, San, Port, Patagonia, W. Coast	0 15	5	
3 51	10	7		Eddystone Pt., Australia, E. Coast	9 39	7		Etches Port, America, N. W. Coast	1 15	9	
2 30	7			Eden Har., Patagonia, W. Coast	12 30	5		Evangelists, Patagonia, W. Coast	1 0	5	
1 40	4			Edgar Port, Falkland Is.	7 15	6		Exmouth, England	6 21	12	8
2 0	6			Edgartown, United States	12 16	2	2	Exuma, Bahamas	7 20	2	
9 39	21	16		Edina, Africa, W. Coast	5 50	4		Eyemouth, Scotland	2 15	15	11
7 33	7	7		Edmonstone, Id., Sherbro River, Africa	9 4	7	5	Eyre Port, Australia, S. Coast	10 30	6	
1 50	11			Egg Id. Lt., United States	2 0	11	6	Fair Isle, Shetlands	11 0	5	3
4 17	5			G. St. Lawrence	3 0	4	2	Fairy Port, Australia, S.C. Falkland Sound (N. entrance), Falkland Ids.	6 45		
12 0	7			Egmont Bay, Prince Edward Island	7 30	11		(S. entrance)	7 0		
11 13	11	9		Islands	11 0	9	7	Fall Harbour, Labrador	6 40	3	
5 18	11	8		Eldes Fjord, Faeroe Ids.	6 15	14	10	Falmouth, England	4 57	16	12
3 0	4			Ejigg Island, Scotland	12 0	11		False Point, Bay of Bengal, W. Coast	8 0	8	
11 47	11			Elbe, Entrance, Germany	4 0	17		Famine Port, Magellan Strait	12 0	6	
4 0	11-12			Elena Sta., Port, Patagonia, E. Coast	1 18	8		Fane Id., Plumper Sound, Oregon	irr.	12	
11 12	20	13		Bay, Ecuador	5 0	5	4	Fannings Id., S. Pacific	4		
8 30	4	2		Elizabeth Bay, Africa, S.W. Coast	5 0	5	4	Fanny Hole, Mulroy Bay, Ireland	6 17	9	8
11 12	18	15		Ellen Port, Islay	5 0	5	4	Fansiak Channel, Canton R., China, E. Coast	1 0	7	5
12 27	12			Ellenwoods Anchorage, Bay of Fundy	5 54	13	10	Farallon, South, California	10 37	4	3
3 0	4			Elliott Port, Australia, S.C.	12 0			Fareham (close to the Upper Quay), England	11 48	11	8
11 41	4	3		Ems River (outer buoy), Germany	10 0	8-10		Bridge, England	11 51	7	4
2 0	12			Encounter Rock, Yellow Sea	10 44	11	8	Farewell, Cape, New Zealand	9 20	14	10
11 0	11	9		Endeavour R., Australia, N. Coast	8 0	5-10		Fatsizio, Japan Sea	6 0	5	
5 0	12	10		Strait, Australia, N. Coast	1 0	9		Fayal, Azores, Atlantic Ocean	11 45	4	
11 12	12-14	9-11		Endermo Harhour, Japan	5 30	6		Fear, Cape, River, United States	7 19	5	4
0 20	9			English Bank, San Carlos, Patagonia, W. Coast	0 4			Fécamp, France	10 44	23	18
2 8	14	11		English Harbour, Antigua	7 30	5		Fenit, Tralee Bay, Ireland	4 3	12	9
10 10	8			English R., Delagoa Bay, Africa, S. Coast	7 30	5		Ferlin Ferry, Jura	4 41	6	4
3 51	10	7		Enora Bay, Japan Sea	4			Fernandina, Clinch Fort, United States	7 53	6	6
12 0	21			Eran Bay (Palawan), China Sea, E. Coast	10 10	6		Fernando Noronha Island, S. Atlantic	4 0	6	
10 14	10	7		Erelus Bay, Barrow Strt.	12 6	8		Fernando Po, Bight of Biafra	4 0	7	
10 56	13	11		Erne River, Digbury Bay, England	5 40	16	11	Ferribly Sluice, River Humber	6 41	20	
2 32	14	11		Erqui, France	5 59	33	24	Ferro, Canary Islands	12 30	9	
10 45	21	19		Erronan or Futuna, S. Pacific	7 24	4		Ferrol, Spain	3 0	15	
9 28	6-10			Escumenac Pt., Gulf St. Lawrence	4 10	4	2	Ferry Side, South Wales	5 49	23	16
12 8	16	13		Esperanza Inlet, Vancouver Island	12 0	12		Filey Bay, England	4 20	16	12
3 45	10	8		Espirito Bay, Brazil	3 0	4		Finisterre, Cape, Spain	3 0		
3 57	9	7									
5 27	12	9									
4 45	12										
11.15	10	8									
2 50	5										
5 10	10-12										
2 0											
8 55	7										

\* May to October from Midnight to 3 A.M. November to April from Noon to 3 P.M.

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Fraserburgh, Scotland	0 40	11	8½		Georgetown, U.S. States	8 40	4½	3½		Gracias, Cape, Harbour,				
Frechette Id., River St. Lawrence	8 0	14	9		South Island, United States	7 56	4½	3½		Bay of Honduras	10 30	2		
Frederick Reef, Australia, E. Coast	8 0	6			Geriah Harbour, Hindostan, W. Coast	2 40	9			Grand Cestos, Africa, W. Coast	5 20	4		
Fredericksshaab, Greenland	6 3	12½	9½		Germain, St., France	6 20	34	25		Har., Gd. Manan, Bay of Fundy	11 7	21	17½	
Freycinet Estuary	4 15	3½			Ghubbet Ne, Socotra, Indian Ocean	7 0	7			Grand Lahou, Africa, W. Coast	4 20	4		
Reach, Sharks Bay, Australia, N.W. Coast	3 0	5			Hashish, Arabia, S.E. Coast	10 0	10			Grand Passage, Bay of Fundy	10 43	20½	17	
Friederichstadt, Denmark	2 37	9			Gibraltar (old Mole), Spain	2 20	3½			Grand Port, Mauritius	1 0	1½		
Frio Porto, Brazil	2 40	4½			Gigha Sound, Scotland	2 22	4	2½		Rustico, Prince Edward Island	6 40	4	2	
Froward Cape, Magellan Strait	1 0				Gijon Bay, Spain, N. Ct.	3 0	14	11		Grande-digue, Madame Id., Cape Breton Id.	7 55	6½	4½	
Fugloe Fiord, Faroe Ids.	11 15	6½	4½		Gilmorris Id., Africa, W. Coast	6 0	11			Grande Point, Chile	9 45	5		
Funchal Bay, Madeira	2 48	7			Gizree Bunder, Indus, Hindostan, W. Coast	9 50	7			Granton Pier, Scotland	2 20	16	12½	
Funk Id., Newfoundland	7 0½	2-3½			Glasgow, Scotland	1 25	9	7½		Gravelines, France	6 13	37	27½	
Fury Cove, Patagonia, W. Coast	1 15				Port, Scotland	0 18	9			Graves Port, Howe Id., G. of Georgia, British Columbia	12 0	19	15	
Harbour, Tierra del Fuego	2 30	4			Glenan Iles, France	3 12	13	10		Gravesend, England	1 10	17½	14	
Fury Id., Tierra del Fuego	2 30	4			Glennie Ids., Bass Strait	12 20				Great Barrier, Id. (Nagle Cove), New Zealand	6 25	10	7	
Fury and Hecla Strait, Arctic Regions	7 0	8			Gloucester Cape, Tierra del Fuego	1 30	5			Great Barrier Reef, Australia, E. Coast	8 48	7		
Gaboon R., Africa, W.C.	5 30	3			Harbour, U.S.	11 4	10½	8½		Great Fish Bay, Africa, W. Coast	2 30	5-6?		
Galang Bay, Hainan Id., China Sea		4-5			Gluckstadt, Germany	3 9	10			Great St. Lawrence Har., Newfoundland	8 30	7	4	
Gallant Port, Magellan Straits	9 0	5½			Goa, Hindostan, W. Ct.	11 30	6			Greatman Bay, Ireland	4 39	15½	11½	
Galle, Point de, Ceylon, S. Coast	2 0	2			Godbout River, Gulf St. Lawrence	1 52	11	6		Green Island, River, St. Lawrence	2 45	16	9½	
Gallegos Port, Patagonia, E. Coast	8 50	46			Gocree (West Gat.)	1 45	7			Greencastle Point, Ireland	11 2	14	11½	
Gallinas R., Africa, W.C.	6 45	4			Gollonsir, Socotra, Indian Ocean	7 20	8			Greenock, Scotland	12 8	9½	8½	
Galloway (Mull of)	11 15	15?	12?		Golovnin Bay, America, N. W. Coast	6 23	3½			Greenwich, England	1 43	19	15	
Galway, Ireland	4 35	14½	11		Gomera, Canary Islands	12 45?	9?			Gregory B., Magellan St. Port, Australia, W. Coast	9 45	23		
Galveston, G. of Mexico		1½	¾		Gometra, Loch Tuadh, I. of Mull	5 29	11½	8		Grenada (St. George Harbour), Caribbee Ids.	2 40	1½	¾	
Gambia R., Africa, W.C.	8 10	6-9			Gonaives B., St. Domingo	8 0	1			Grenadines, Caribbee Ids.	3 0	1½	1	
Gambier Ids., Australia, S. Coast	1 50	3			Good B., Newfoundland	10 40	7½	5½		Grey Port, Swan River, Australia, W. Coast	9 0	1-1½		
Garliestown, Scotland, W. Coast		17	12		Goods Bay, Patagonia, W. Coast	0 30	7			Greytown, Mosquito Ct.	9 0	1½		
Garroch Head	11 49	10			Good Hope, Cape of, China, E. Coast	9 0				Grihanika Pt., White Sea	4 50	3		
Gaspé Basin, Gulf St. Lawrence	2 40	5	3		Good News, B., America, N. W. Coast	6 15	13½			Griffin Bay, Huro Archipelago	irr.	12		
Gay Head, United States	7 37	7			Good Success Bay, Tierra del Fuego	4 3	6-8			Griffith I., Barrow Strait	12 15	3½	2½	
Geby, Fohou Id., Gilolo Passage, Moluccas		5			Goold Id., Australia, E.C.	6 45	6			Griguet Bays, Newfoundland	7 0?	2-3?		
Geelong Harbour, Australia, S. Coast	2 30	3½	2½		Goole, River Humber, England	7 26	13			Grimsby, England	5 36	19½	15	
George Cape, Nova Scotia	9 15	4	2		Gooriya Creek (entrance), Hindostan, W. Coast	11 0	9			Grindstone Island, Bay of Fundy	11 47	41	34½	
George d'Elmina, St., Africa, W. Coast	4 30	6			Goose Cove, Newfoundland	7 0?	2-3?			Grinez Cape, France	11 27	21½	16½	
Port, B. of Fundy	11 17	32	28		Gorda Sound, Virgin Ids.	8 30	1½			Gronidine, R. St. Lawrence	9 0	9	6	
St., Basin, Australia, N.W. Coast	12 20	24-37			Gore Port, New Zealand	9 0	8	6		Guambacho Bay, Peru	6 30	2		
Shoals, United States	10 30	7			Goree, Africa, W. Coast	7 45	2½			Guardafui Cape, Africa, E. Coast	6 15	6		
Georges Bay, Tasmania	9 42	3	2		Goree Road, Tierra del Fuego	4 0	8			Guarmey Bay, Peru	6 10	2		
Georges, St., Sound, G. of Mexico, Mid entrance	1 31	1½	1½		Goulburn Ids., Australia, N. Coast	6 0				Guatuelco, Mexico, W. C.	1 30	5		
West entrance	irr.	2½-4			Goury, France	7 6	22	17½		Guayaquil, Ecuador	7 0	11		
					Gowland Har., Discovery Pass., Vancouver Id.	5 30	11			Guaymas, Mexico, W. C.	8 0	4		





TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

High Water, full and change.		RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Fall and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.	
H. M.	ft.	Spgs.	Nps.			H. M.	ft.			ft.	H. M.			ft.	ft.
3 25	7			Kircubbin, Ireland	12 42	11½	9½	Laguna de Terminos, G. of Mexico	noon	1½		Liau-tung, Gulf (Sand Point), Yellow Sea	4 50	7	5½
11 54	15			Kirindi, Ceylon	3 30			Lamalin, Newfoundland	9 15	8½		— N. W. Head of Gulf	5 30	10	8½
9 0	6			Kirkcubright, Scotland	11 10	23		Lambayque Rd., Peru	4 0	3		Limerick, Ireland	6 16	18½	13½
10 30	9½	6		Kirkwall, Orkneys	10 9	10	7½	Lanulash, Scotland	11 49	10	7	Lindy River (entrance) Africa, E. Coast	4 15	12	
3 49	6½			Kishn, see Kesm.				Lamo Har., Africa, E. C.	4 6	11		Lingeh, Persian Gulf	12 0	0	
6 4	6½			Kiswara Har., Africa, E. Coast	4 30	12		Lancaster, England	11 16	8½		Lintin Island, Canton R. China, E. Coast	12 0	7½	
2 30	5	7		Klaskino Inlet	12 0	12		Landshipping, Cleddau River, Wales	6 27	20	14½	Lisbon (Belem), Portugal	2 30	12	9
6 30	10			Klaskish Inlet, Vancouver Island	12 0	12		Lankeet Island, Canton River, China	11 20	6½		Liscanor Bay, Ireland	4 23	13½	10
9 30	12			Knox Bay, Vancouver Id.	12 0	16		Lansew Bay, China, E. C.	10 0	13		Liscomb Har., Nova Scotia	8 0	6½	4½
6 0	22			Koepang, Timor	11 0	9		Lanzarote, Canary Ids.	1 0?	9?		Lishan Bay, China, E. C.	10 15	16	
9 57	9			Kokohu, New Zealand	10 15	10		Laredo B., Magellan Str.	11 30	9		List, Denmark	2 21	6	
11 30				Ko-kun-to Group, Korea, W. Coast	2 25	18	6½	Largs, Scotland	11 50	10		Litau Bay, Yellow Sea	3 0	6	4
11 0				Kok-si-kor Pt. (Formosa) China Sea, E. Coast	11 30	3	10	Latham Id., Africa, E. C.	4 0	10		Litke Ridge, White Sea	11 45	15	
5 30	5			Koombanah B., Australia, W. Coast	9 0	½-3		Latitude Bay, Tierra del Fuego	2 5	4		Little Egg Har., United States	7 10	4½	3½
10 45	5	3		Korea R. (Monda Point), Hindostan, W. Coast	11 40	11		Lau-mu-ho, Yellow Sea	1 30	5		Little Fish Bay, Africa, W. Coast	2 30	5-6?	
10 30	3			Kotipatnam, Bay of Bengal, W. Coast	11 0	1½		Laun, Great and Little, Newfoundland	8 15	7	4	Little Gull Island, U.S.	9 38	3	2½
3 52	10	7½		Koulo River	1 15	20		Laura Har., Tierra del Fuego	1 0	6		Littlehampton, England	11 36	16	11½
8 0	5½			Kou Zomen, White Sea	3 30	6		Lavata Bay, Chile	9 20	5		Little Metis, G. St. Lawrence	2 10	13	8
11 15	9½	8		Kovda Bay, White Sea	3 25	6		Lawrence, Great St., Har., Newfoundland	8 30	7	4	Little Milford Quay, R. Cleddau, Wales	6 31	19	13½
11 10				Koweit, Persian Gulf	0 15	9		Le Ilave Cape, N. Scotia	7 48	7	5½	Little Natasiquan, G. St. Lawrence	11 0	5	3
11 47				Krakatoa, Strait of Sunda	7 0	4		— Nova Scotia	7 51	7½	6	Little Tancock Island, Nova Scotia	7 43	7½	6
9 30	9-14			Kuper Har., Korea, S. C. Port, America, N. W. Coast	1 40	13	10½	— Mothers Island	7 51	7	5½	Liverpool, England	11 23	26	20½
3 8	6			Kuriyan Muriyan Bay and Islands, Arabia, S. E. Coast	8 20	6½		— Getsons Cove	7 55	7½	5	— Bay, N. Scotia	7 50	8	5
4 30	5½			Kurrachee, see Karachi.				— Bridgewater (McKean's Wharf)	8 6	8	6½	Liza Bay, Lapland	5 58	9	
2 0	2			Kweshan Ids., China, E. Coast	9 30	14		Lunenburg (Spidlers Cove)	7 54	7½	6	Lizard Id., Australia, E. Coast	9 15	7-10	
11 0	12	4½		Kyau-chau Bay, Yellow Sea	5 0	12	9	Le Maire Strait, Tierra del Fuego	4 0	7		— Point (Perran Vose Cove), England	5 0	14½	10½
9 30	10			Kyam River, White Sea	5 23	4		Leervig Fiord, Faeroe Ids.	0 30	6½	4½	Llanelly (Bar), Wales	6 16	23	21
10 0	9	6		Kykduin, Netherlands	7 0	12		Leith, Scotland	2 17	16½	12½	Lloyd Port, Bonin Ids.	6 8	3	
4 16	13	9½		Kyle Akin, Loch Alsh, Scotland	6 16	15½	11	Leman Shoal, England E. Coast	6 0			Loanda, San Paul de Africa, W. Coast	4 20	5	
5 30	12			Kyle Rhea, Scotland	6 0	15	11	Lennox Cove, Tierra del Fuego	4 40	8		Lobah Point, Banks Str.	11 0	10	
6 45	15½	11		Kyuquot Sound, Vancouver Island	12 0	12		Leopold Port, Barrow St.	12 6	6	4½	Lobito Bay, Africa, S.W. Coast	2 20	5	
4 34	15½	8		La Poile B., Newfoundland	9 0	6	4	Lepreau, Bay of Fundy	11 18	24½	21	Lobo Point, Peru	8 0		
5 22	10½			Labnan Id., China Sea, E. Coast	9 45	6		Lerwick, Shetland	10 30	6	4	Lobos Cay, Bahamas	7 40	3	
4 28	13½	10		Labyrinth Ids., Magellan Strait	0 30	5½		L'Etang Har., Bay of Fundy	11 19	23½	20	Lobos Head, Patagonia, W. Coast	0 23		
6 2	19½	15½		Lacul Har., St. Domingo	6 0?	3?		Leubu River Chile	10 30	5		Loch Aline, Scotland	5 33	13½	19½
5 16	11½	8½		Lady Bay, Australia, S.C.	4			Leven Port, Madagascar	3 30	7½		— Alsh	6 16	15½	11
12 40	11	9½		Lady Elliot Islet, Australia, E. Coast	9 0	7-8		Lewier Bay, Africa, W. Coast	12 0	6-7		— Boisdale	5 47	12½	9½
8 30	4½	3		Lagos, Portugal	2 7	13		Lewis Cape, St., Labrador	6 30			— Broom	6 40	14½	10½
4 42	14	10½		Lagos River (Consulate Wharf)	6 0	3		Liant Cape (G. of Siam), China Sea, W. Coast	5 7	6½		— Carron	6 29	16½	11½
2 53	17½	15		Laguimanoc Port, Luzon	1 30	5½		Liau Ho (Bar), Yellow Sea	4 0	11½	7½	— Caen	5 38	13	9½
1 0								— (entrance)	5 0	12		— Duich	6 0	15½	11
7 30	5							Liau-tung, Chingho, Yellow Sea	1 20	6½		— Dunvegan	6 7	15½	11
0 10	33											— Eil (Head of Loch)	6 27		
5 46	10											— Eport	6 6	12½	9½
11 10	11	5½										— Eriholl	-7 43	13	11
4 43	11½	9										— Erisort	6 43	15½	11½
7 0															

\* At the Langshan Crossing the tide rises for 3 hours only, and falls for 9 hours.—H.M.S. Acton, 1861.

† In S.E. Monsoon.







## TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	h. m.	ft.	Spgs.	Nps.		h. m.	ft.	ft.	h. m.		ft.	ft.	ft.	
Mutlah (Muda Kali), Bay of Bengal, W. Coast.	11 45	15			Nelson, New Zealand	9 50	14	10	Nisqually, America, N.W. Coast	6 0	18	15		
Mutton Island, Ireland, W. Coast	4 20	13½	9½		Port, Australia, N.W. Coast	12 0	27		Noamh Island, Scotland	6 2	11½	7		
Myggenes Fiord, Faeroe Islands	9 0	9½	7½		Neuf Port, Gulf St. Lawrence	2 10	13	8	Noel, Bay of Fundy	12 41	50½	43½		
Naafe R., Bay of Bengal, E. Coast	10 0				Perican, River St. Lawrence	8 30	14	9	Noir Island, Tierra del Fuego	2 30	5		11½	
Naaloe Fiord, Faeroe Islands	4 0	6½	4½		Neville Port, Vancouver Island	0 30	17		Noirmoutier, France	3 2	16			
Nafa-Kiang, Loo Choo Islands	6 23	7			New Bedford (entrance), United States	7 57	4½	4	Nollóth Port, Africa, S.W. Coast	2 30	5½			
Nagasaki Bay, Japan Sea	7 15	9	7½		Castle, United States	11 53	7	6½	Nootka Sound, Vancouver Island	12 0	12			
Nagore, Bay of Bengal, W. Coast	8 15				Haven, "	11 16	6½	5½	Norderney, Germany	10 30	8			
Nanki Ids., China, East Coast	8 30	17			London, "	9 28	3	2½	Nore, England	12 30	15½	13		
Namoa Island (Clipper Road), China, E. Coast	11 15	7			Perican Harbour, Newfoundland	7 30	4	2½	Norfolk Island, S. Pacific	7 45	7			
Nanquan Harb., China, E. Coast	10 0	17			Providence, S.W. Bay, Bahamas	7 30	4		North Balabao Strait, China Sea	10 50	5			
Nanaimo Harb., Gulf of Georgia, Vancouver Island	5 0	14			Rochelle, U. States	11 22	8½	7½	North Cape, C. Breton Id., Edisto River, United States	7 10	7	5½		
Nancowry Har., Nicobar Islands	9 15	8½			Ross, Ireland	6 4	12½	10	North Harbour, Newfoundland	8 0	7½	5		
Nangamesse Harbour, Sumba	11 30	17	13½		Year Sound, Tierra del Fuego	3 30			Sands, Malacca Strait	5 30	15	12		
Nangka Id., Banka Strait	12				York, United States	8 13	5½	4½	Noss Island, Madagascar	5 0	15			
Nanoose Harbour, Vancouver Island	5 0	15			Newburyport, "	11 22	9	7½	Nova Zembla Harbour, Lapland	6 36	10			
Nansaree River (Bar), Hindostan, W. Coast	3 0	18			Newcastle, Australia, E. Coast	9 45	6-7		Nuchatlitz Inlet, Vancouver Island	12 0	12			
Nantucket, United States	12 24	3½	3		England	4 23	10½		Nuevo Gulf, Patagonia, E. Coast	7 0	10			
Napoleon Road, Gulf of Tartary	2 30	2½			Ireland	11 4	14½	12	Port, Cent. America	3 10	12			
Narrinda Bay, Madagascar, W. Coast	4 30	15			Newhaven, England	11 51	20	15	Nukulan Port, Figii Ids.	6 47	5½			
Narrows (First), Magellan Strait	9 0	36-42			Newport, United States	7 45	4½	4	Numa-choa, Comoro Ids.	3 0	14			
Narrows (Second), Magellan Strait	10 0	23			Wales, South Coast	7 10	38	29	Nunez River, Africa	10 0	15	11½		
Naruto (Fukura), Japan Sea	6 17	7			W. Cst.	7 0	12	9	Nyninde Gab, Jutland	2 41	2			
Nash Pt., Bristol Chan.	6 25	33	25		New Quay, Wales	7 30	15		Nysoa Harbour, Africa, S. Coast	3 45	5			
Nasparte Inlet, Vancouver Island	12 0	12			Newton Stewart, Scotland, W. Coast	12 0	12	6	Oban, Scotland	5 22	12	9½		
Nassau, New Providence, Bahamas	7 30	4	3		Nhatrang Bay, China, W. Coast	8 30	5½		Obb of Harris, Isle of Harris, Scotland	6 16	11½	8½		
Nassau Bay, Tierra del Fuego	4 40	6			Nicholas, St., Harb., G. St. Lawrence	1 55	12	7	Observatory Id., China Sea, E. Coast	11 0	5½			
Natal Port, Africa, S. C.	4 30	6			Nicholson Port (Lambton Harb.), New Zealand	5 15	3	3	Ocracoke Inlet, United States	7 4	2½	2		
Naturaliste Chan., Sharks Bay, Australia, N.W. Coast	11 45	6			Nicobar Id., (Nancowry Harb.), Indian Ocean	4 30	5		Octavia Bay, New Granada	3 30	13			
Navallo Port, France	3 42	13	9½		Nicolas, St., Bay, Magellan Strait	9 15	8½		Oelar Cape, Banka Strait	6 30	12			
Nazaire, St., France	3 40	15½	11		Nicoya Gulf (Port Heradura), Central America	2 6			Oho Sima, Loo Choo Ids.	7 30	5½			
Naze, the, England	12 6	12½	10		Nieuport, Belgium	8 9	10	13	Oibo Harb., Africa, E. Coast	4 15	6			
Nee-ah Harbour, Oregon	12 33	7½	6½		Nieuwediep, Netherlands	12 18	16	13	Olaveaga, Bilbao River, Spain	3 15	12			
Needles Point, England	9 46	7½	5		Niger River (Nun entrance), Africa, W. Cst.	7 27	4	3½	Old Pt., Comfort, United States	8 17	3	2½		
Negapatam, B. of Bengal	5 0	3			Nikolskoi Chan., White Sea	4 8	6		Old Providence, Bay of Honduras	irr.	1			
Negro Harbour, Nova Scotia	8 12	7	5½		Nimrod Sound, China, E. Coast	5 25	3	2	Oleron, Ile d', France	7 30	12			
Negro River, Patagonia	11 0	14			Ninepin Group, China, E. Coast	6 0	2		Omaider Island (Gulf of Akabah), Red Sea	3 50	19			
					Ning-hai, Yellow Sea	10 0	5		Omersary R., Hindostan, W. Coast	6 0	4			
					Nin-po-fu, Yung River, China, E. Coast	12 0	6		Omonville, France	1 45	18			
							1 0	9		7 29	15½	12½		

TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

High Water, and range.	RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.	
	Spgs.	Nps.			Spgs.	Nps.			Spgs.	Nps.			Spgs.	Nps.
	m.	ft.			ft.	ft.			ft.	ft.			ft.	ft.
6 0	18	15	'Om-rasas-Masrah, Arabia, S. E. Coast . . .	10 0	10		Palmado Road, Sumba Island . . .		15		Pelican Lagoon, Kangaroo Island, Australia . . .	5 0	6	
5 2	11½	7	One-Fathom-Bank Light, Malacca Strait . . .	6 0	15	12	Palmeira Point, Ceylon . . .	9 30	7-11		Pelorus Sound, New Zealand . . .	9 35	11	7
2 41	50½	43½	Onega River, White Sea . . .	9 17	6-7		Palawan Bay, Mindoro . . .		5		Pemba Channel, Mozambique . . .		4 0	11
2 30	5		Oolooogan Bay, China Sea, E. Coast . . .	9 30	5½		Pamarung Ids., Borneo, E. Coast . . .		8-10		— Id., Mozambique . . .		4 15	12
3 2	16	11½	Oonting Port, Loo Choo Islands . . .	6 35	8		Painpaug Bay, Java . . .		7-8		Pembroke Dockyard, Wales . . .	6 12	21	15½
2 30	5½		Oosima, Japan Sea . . .	6 50	5		Panama Road, Central America . . .	3 23	15-22	10-16	Penang, Malacca Strait . . .	12 0	9	7½
12 0	12		Oparto, Portugal . . .	2 30	10		Pancol, China Sea, E. C. . .	9 40	0		Peñas Cape, Tierra del Fuego . . .	6 2	12	
10 30	8		Orange B., T. del Fuego . . .	3 30	5		Pansand Holo, England . . .	12 0	15½	13	Pender Harb., Strait of Georgia, B. Columbia . . .	6 0	13	
12 30	15½	13	— Cape, Magellian Strait . . .	3 0			Paposo, Chile . . .	9 45	5		Peniche, Portugal . . .	1 54		
7 45	7		Orford Haven (Bar), England . . .	11 30	7½		Paquique Cape, Bolivia . . .	12 0	11		Penmark Rocks, France . . .	3 16		
10 50	5		— Port, California . . .	11 30	6½	4½	Para, Brazil, N. Coast . . .	5 0	9-12		Pennington R., Bight of Benin . . .	4 15	5	
8 0	4		— Quay, England . . .	12 30	7½		Parahiba, Brazil . . .				Pensacola, G. of Mexico . . .		1½	
7 10	7	5½	Orfordness, England . . .	11 15	8	6½	Paranga-ranga Harbour, New Zealand . . .	7 51	7		Pentillie, R. Tamar, England . . .	5 55	13½	9½
8 0	7½	5	Orinoco River (entrance), Guayana . . .	6 0	3		Parida Id., New Granada . . .	3 15	10½		Pentland Firth, Stromma, S. Side . . .	9 47	9	6½
5 30	15	12	Orleans Island, River St. Lawrence . . .	5 40	17	13	Parshoro, Bay of Fundy . . .	12 17	43	37½	— Swona, E. Side . . .	10 24		
5 0	15		Ormond, Kenmare River, Ireland . . .	3 43	10	7½	Pasador Cape, Ecuador . . .	3 30	10		— W. Side . . .	9 35		
6 38	10		Ormsay, I. of Skye . . .	5 50	14½	10½	Passages Port, Spain . . .	3 0	12	9	— Great Skerry, E. Side . . .	11 4	9½	6
12 0	12		Orlov Letni C., White Sea . . .	5 18	4		Passage or Culebra P., Caribbean Sea . . .	9 0	1		— W. Side . . .	10 53		
7 0	10		Os Ilheos, Brazil . . .	4 30			— Id., Banda Sea . . .	noon	6		Penzance, England . . .	4 30	16½	12½
3 10	12		Osaki, Japan Sea . . .	5 55	6½		Passandava Bay, Madagascar, W. Coast . . .	5 0	15		Percy Isles, Middle or No. 1 Island . . .	10 30	16	13
6 47	5½		Oscuro Cove, Patagonia, W. Coast . . .	0 55	20		Patapsco R. (Bodkin Pt.), United States . . .	5 42	1½	1	— South or No. 2 Islet, Australia, E. Coast . . .	10 30	14	
3 0	14		Osprey Reef, Australia, E. Coast . . .	8 36	6		Paterson Port, Australia, N. Coast . . .	4 0	16-24		Perim Id., G. of Aden . . .	12 0	7	
10 0	15	11½	Ostend, Belgium . . .	12 25	19	15	Patersons Inlet, New Zealand . . .	1 10	5	6	Pernambuco, Brazil . . .	4 45	8-9	
2 41	2		Otago Har., New Zealand . . .	2 50	7	5	Patrick Port, Scotland . . .	11 10	15	12	Peros Banhos, Indian Ocean . . .	1 30	5	
3 45	5		Otaheite, South Pacific . . .	noon	1½		Patta B., Africa, E. Coast . . .	4 30	10		Perouse, La, Strait, Japan Sea . . .	10 30	6	
5 22	12	9½	Otterswick, Orkneys . . .	9 13	11	8	Patteson Port, Vanu Lava Id., Banks Islands . . .	6 40	5		Perron Cape, Sharks Bay, Australia, N.W. Cst. . .	12 45	5½	
6 16	11½	8½	Otway Port, Patagonia, W. Coast . . .	11 37	6		Paul de Loanda, San, Africa, S.W. Coast . . .	4 30	5		Perth, Scotland . . .	3 35		
11 0	5½		Ou ou Kinsh Inlet, Vancouver Island . . .	12 0	12		Paul, St., Island, Indian Ocean . . .	11 0	3		Perulz Bay, Mexico, W. Coast . . .	7		
7 4	2½	2	Ounalashka Id., America, N.W. Coast . . .	7 30	7½		— G. St. Lawrence . . .	8 0	5	3	Pescadore Ids. (Makung Harb.), China Sea . . .	10 30	9½	7
3 30	13		Ouro R., Africa, W. Cst. . .	12 0	8-9		Paumben Pass, Bay of Bengal, W. Coast . . .	1 30	2		Peter, St., Bay, C. Breton Island . . .	7 30	6	4
6 30	12		Ower Shoal, England, E. Coast . . .	6 30			Payta Port, Peru . . .	3 20	3		— Harb., Prince Edward Island . . .	8 30	4	2½
7 30	5½		Oxbaasheia, Svee Fiord, Norway . . .	12 0	8		Pearce Point, Australia, N. Coast . . .	6 55	20	26	Peterhead, Scotland . . .	0 34	10½	8½
4 15	6		Oyster Bay, United States . . .	11 7	9½	8	Peckett Harbour, Magellan Strait . . .	12 0	6		Petit Passage, B. of Fundy . . .	10 41	22	18
3 15	12		Oystrelham, France . . .	9 38	21	16	Pedro Gonzales, New Granada (Trapichli Island) . . .	3 50	16		Petit Port, B. of Islands, Newfoundland . . .	10 42	5½	
8 17	3	2½	Packsallie Bay, Tierra del Fuego . . .	3 30	0		Pedro, San, Pass, Patagonia, W. Coast . . .	0 30	9		Petrel Bay, St. Francis Isle, Australia, S. Cst. . .	12 0	6	
irr.	1		Padstow, England . . .	5 13	20½	16½	— Bay, California . . .	9 39	4½	3½	Petucura Rock, Patagonia, W. Coast . . .	0 50	16	
7 30	12		Pagham (entrance), England . . .	11 30	16½	12½	Peel, Isle of Man . . .	11 8	16½	13	Pheasant Point, Wusung River, China, E.C. . .	0 35	13	8
3 50	19		Painpoul, France . . .	6 0	31	23½	Pegasus Port, New Zealand . . .	11 50	8	6	Philadelphia, U. States . . .	1 18	6½	5½
6 0	4		Palais, Port le, Belle Ile, France . . .	3 18	14½	10½	Peh-tang-ho, Yellow Sea . . .	3 33	10	7½	Philip B., E. side, Magellan Strait . . .	9 30	24	
1 45	18		Palliser Cape, New Zealand . . .	6 0	6		Pei-ho or Peking River (entrance), Yellow Sea . . .	3 40	10	7½				
7 20	15½	12½	Palma, Canary Islands . . .	12 30	9½		— (Tien-tsin) . . .	7 0	4½	6				
			Palmas Cape, Africa, W. Coast . . .	4 30	4		Pelew Islands, N. Pacific . . .							



## TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

17\*

High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.						
H. M.	ft.	Spgs.	Nps.			H. M.	ft.			Spgs.	Nps.	H. M.	ft.	Spgs.	Nps.	
				Quilimane R. (entrance), Africa, E. Coast . . .	4 15	16		Rendezvous Id., Borneo, S.W. Coast . . .					Basel, Jersey, English Channel . . .	6 15	30	21½
				Quillebeuf, France . . .	10 6	9½	7½	Strait of Georgia . . .	7 0	14			Roshnoff Cape, America, W. Coast . . .	7 30	15	
3 45	4½			Quiloa, Africa, E. Coast . . .	4 45	12		Rendsborg, Denmark . . .	7 42	4			Rota, Spain . . .	1 24	12½	9
				Quoilo Quny, Strangford, Ireland . . .	12 45	11	9½	Renfrew, R. Clyde, Scotland . . .					Rottoream, Netherlands . . .	3 45	7	
11 56	1-4			Rabat, Africa, W. Coast . . .	1 46	9-12		Resolution B., Marquesas Port, Tanna Id. . .	1 15	9			Rottnest Id., Australia, W. Coast . . .	7 50	23	
7 43	7	6		Raco, Cape, Newfoundland . . .	7 0	6½	5	Rennion Id., (St. Pierre) Indian O. (St. Denis) . . .	2 30	4			Rouen, France . . .	2 28		
11 22	10½	9½		Rachada Cape, Malacca Strait . . .	5 30	13		Rennion Id., (St. Denis) Indian O. (St. Paul) . . .	5 35	3			Rouge Harbour, Newfoundland . . .	7 0½	2 4	
				Radama Port, Madagascar, W. Coast . . .	4 40	13		Ribble Lighthouse, England . . .	0 22	2½			Roundstone, Ireland . . .	4 23	15½	10½
9 25	12	10		Ranged Id., Sumbawa, Java Sea . . .	8 10	3		Richibucto R., Gulf St. Lawrence . . .	1 7	4			Rovama Riv., Africa, E. Coast . . .	4	16	11½
				Point, Borneo, E. Coast . . .		7		Richmond, United States Harb., Prince Edward Island . . .	3 30	4	2½		Royal Harbour, Ruataua Bay of Honduras . . .	7 45	3½	
1 40	2½			Raine Id., Torres Strait . . .	8 10	10		Richmond, United States Harb., Prince Edward Island . . .	4 28	3	2½		Royal Island, Bahamas . . .	7 45	3½	
9 7	2½			Rajapoor Harb., Hindostan, W. Coast . . .	11 0	12	9	Rio de la Plata, Cape Castillos . . .	6 0	3	2		Royal Port, Jamaica . . .	0	1	
				Rajang River, Borneo . . .	4 45	13	9	Rio de la Plata, Cape Castillos . . .	9 20				Royalist Port, Palawan, E.C. . . .	0	1	
7 30	3½			Ramos R., Bight of Benin . . .	4 20	5		Ryde, Australia, E.C. . . .	7 0	5-9			Ruaupoko Id. (Foveaux St.) New Zealand . . .	0	8	6
8 49	2½			Ramree Road, Bay of Bengal, E. Coast . . .	10 0	12		Ryde, Australia, E.C. . . .	8 30	2			Rugged Id., Bahamas . . .	8	3	
6 0	18	15		Ramsay Sound, Wales . . .	6 0	17		Ryde, Australia, E.C. . . .	12 0	3-5			Ruggles B., Falkland Ids. . .	7	5	
				Ramsey, Isle of Man . . .	11 12	19½	16	Sable Cape (Clam Point), B. of Fundy . . .	7 0				Rutland Id., Ireland, W. Coast . . .	5 2	17	8
10 30	7	4		Ramsgate, England . . .	11 44	15	12	Sable Island, N. side, Nova Scotia . . .	7 0	5-9			Ryde, England . . .	11 20	13½	
7 20	8	7		Ramsoe Fiord, Norway . . .	10 45	7		Sable Island, S. side, Nova Scotia . . .	11 0	1½-2	3		Rye Bay, England . . .	11 20	22	17½
9 25	2½			Rangoon, Bay of Bengal, E. Coast . . .	5 30	21	14	Sable Cape (Clam Point), B. of Fundy . . .	11 0	4			Sabine Pass, G. of Mexico . . .	8 27	8½	6½
				R. (entrance), B. of Bengal, E. Coast . . .	3 15	21	14	Sable Cape (Clam Point), B. of Fundy . . .	11 0	14			Sables d'Olonne, Les, France . . .	8 58	11	9
2 30	6½			Raoul or Sunday Island, S. Pacific . . .	6 0	5		Sable Island, N. side, Nova Scotia . . .	10 0	15	11½		Sable Island, S. side, Nova Scotia . . .	7 30	4	
2 30	4			Rappahannock (Saunders Wharf), United States . . .	3 2	2½	2	Sable Island, S. side, Nova Scotia . . .	10 0	15	7		Sables d'Olonne, Les, France . . .	6 30	4	
7 0	2			Ras Hafun, Africa, E. C. . .	6 15	4		Sables d'Olonne, Les, France . . .	10 0	4			Saboga, New Granada . . .	3 26	14	10
6 0	7½			Ras Jerdafoon. See Guardafui Cape . . .	9 0	8		Saboga, New Granada . . .	9 30	6	4		Sabon Id., Durian Strait . . .	1 9	14	
1 5				Ras Mohommed (Gulf of Akabah), Red Sea . . .	6 0	5		Sacred Bay, Newfoundland . . .	irr.	12			Sacrificios Port, Mexico, W. Coast . . .	7 23	2½	
6 0	11			Ras Sharmah, Arabia, S.E. Coast . . .	9 0	8		Saddle Id., East, China, E. Coast . . .	4 6	17	13		Sado (Yebisu), Japan Sea . . .	3 15	6	
9 45	6			Ras al-Kheimeh, Persian Gulf . . .	11 45	7		Sado (Yebisu), Japan Sea . . .	3 31	17	13		Saguenay, Chicoutimi, G. St. Lawrence . . .	5 6	2	
7 46	13½	9½		Ras al-Asfah } Arabia } S.E. Coast { . . .	8 30	5½		Saguenay, Tadoussac, G. St. Lawrence . . .	10 57	10½	8		Saigon (C. St. James) . . .	4 11	12	8
12 0	5½			Ras al-Hed } Arabia } S.E. Coast { . . .	10 0	10		Saigon (C. St. James) . . .	3 30	12			Saigon (Saigon City), Cochinchina . . .	2 45	17	10
				Rathmullan, Ireland . . .	5 42	12½	9	Saigon (Saigon City), Cochinchina . . .	4 0	4			Saintes, Caribbean Sea . . .	11 0	8	
8 50	8	8		Raupoor (G. of Cambay), Hindostan, W. Coast . . .	2 15	18	13	Saintes, Caribbean Sea . . .	1 45	6			Sal. C. Verde Ids., Africa, W. Coast . . .	5 30	9½	
				Realejo, Cent. America . . .	3 6	11		Sal. C. Verde Ids., Africa, W. Coast . . .	10 30	30	18		Salango Id., Ecuador . . .	7 45	5	
2 37	18	14		Reconlavi Inlet, Patagonia, W. Coast . . .	0 44	14		Sal. C. Verde Ids., Africa, W. Coast . . .	10 45	6			Salcombe, England . . .	12 41	12	
5 1	11½	9		Red Bay, Ceylon, South Coast . . .	2 20	2½		Sal. C. Verde Ids., Africa, W. Coast . . .	6 20	14½	10½		Saldanha B., Africa, W.C. . . .	5 41	15	11½
0 28				(Pier), Ireland . . .	10 31	4	4	Sal. C. Verde Ids., Africa, W. Coast . . .	6 20	14½	10½			2 0	6	
9 5	9			Labrador . . .	7 46	3½	1½	Sal. C. Verde Ids., Africa, W. Coast . . .	10 45	6						
0 57	20			Id., Durian Strait . . .	5 0	10½		Sal. C. Verde Ids., Africa, W. Coast . . .	6 20	14½	10½					
				Redbridge, England . . .	10 42	8½	6	Sal. C. Verde Ids., Africa, W. Coast . . .	2 30	6½						
				Refuge Cove, Bass Strait . . .	12 5	5		Sal. C. Verde Ids., Africa, W. Coast . . .	4 0	4						
7 36	3½	3½		Rigneville, France . . .	6 20	35	26	Sal. C. Verde Ids., Africa, W. Coast . . .	1 45	6						
7 31	4½	3		Reikjavik, Iceland . . .	5 0	17½	13½	Sal. C. Verde Ids., Africa, W. Coast . . .	0 30	30	18					
8 0	6							Roebuck Bay, Australia, W. Coast . . .	4 46	23	17½					

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.	
Sale Macowa, Red Sea	0 30	2			Santa Island, California	9 35?	5?	4?		Serrana Bank, Mosquito Coast			2		
Salem, United States	11 13	10½	8		—Teneriffe, Canary Is.	1 30	8			Serranilla Bank, Mosquito Coast	irr.	2			
Salm R., Africa, W. Cst.	8 10	6			Santa Maria Island, Chile	10 20	6			Sesham Islands, Hang-chu Bay, China, E. Coast	11 45	14			
Salmedina Rocks, Spain	1 27	12½	8		Santander, Spain	3 30	15	12		Setubal, Portugal	2 30	8	11½		
Salomon Ids., S. Pacific	6 45	2			Santiago de Cuba, Cuba	8 33	2½			Seudre, River (entrance), France	3 31	15			
Saltash, R. Tamar, England	5 45	15	11		Santona, Spain	3 30	12½	10½		Seybelle Archip. (Mayhé Id.), Indian Ocean	4 0	6½			
Salt Cay Anchorage, Bahamas	8 15	4	3		Saparooa Id., Moluccas	1 0	10			Seypan Id., Ladrone Ids.	6 45	2½			
Saltees, St. George's Channel	5 40				Sapie Bay, Sumbawa	4 0	9	5½		Seven Islands, Lapland Bay, Gulf	8 20	12	5		
Salvador, San, Port, Falkland Islands	8 10	8			— Santuhong (entr.)	4 0	10	6		— St. Lawrence	1 40	9	8		
Samanco B., Peru	6 30	2			— Sarawak Junction City, Borneo, W. Coast	5 20	15-18	9		Sha-lui-tien Banks (west part), Yellow Sea	2 50	10			
Sambilangs, Malacca St.		12	10½		Sarn Badrig, or the Causeway, Wales	7 30	13			Shab Kadún, Arabia, S.E. Coast	9 20	10			
San Francisco (North Beach), California	12 6	4½	3½		Sarn-y-bweh Reef, Wales	7 40	14			Shab'bu-saifeh, Arabia, S.E. Coast	9 45	10			
San Bartholomew Port, California	9 10?	7-9?			Sau-o Bay, Formosa	10 0	3½			Shallow Harb., Falkland Islands	9 30	6	7		
Sau Blas, Mexico, W. C.	9 41	6½			Saugor Id., B. of Bengal		12			Shanghai, Yang-tse-kiang, China, E. Cst.	0 40	10			
San Juan (anchorage), California	9 40?	5			Sanmaraz Reef, Australia, E. Coast	8 0	6			Shao-king, Si-kiang, China, E. Coast		3			
— del Sur, Central America	3 8?	10!			Savannah (city), U.S. (entrance), U.S.	8 13	7½	6!		Sharja, Persian Gulf	1 0	6			
— River, New Granada	6 0	12			Scales Point, Blackwater River, England	12 0	14½	10		Sharks Bay, Naturaliste Channel	11 45	6			
San Lucar, Spain	1 53	12½	8		Scalloway, Shetland	9 20	5½	4½		— Denham Sl.	12 5	5			
San Miguel, California	9 25	5	4		Scarborough, England	4 11	15½	12½		— Freycinet					
San Rosa Id., California	9 30?	5?	4!		Scarcies Rivers, Africa, W. Coast	7 10	10			— Reach	3 0	5			
Sand Cay, United States	8 40	2	1		Searnish, Tiree Island, Scotland	5 31	12	9		— Estuary	4 15	3!			
Sandalwood Bay, Fiji Ids.	6 0	6?			Seilly (St. Agnes Island), (St. Mary Island), England	4 30	16	12		— Cape Perron	12 45	5½			
Sand Point, G. of Liautung, Yellow Sea	4 50	7	5½		— Trescow	4 18	15½	11!		— Havelin Pool	5 0	3½			
Sands Pnt., United States	11 13	9	7½		Sea Bear Bay, Patagonia, E. Coast	12 45	20			N.W. Coast					
Sandwich Port, Malicolo Id., Banks Ids.	5 30	4			Seaforth Loch, Athline, Scotland	6 16	15	10		Shediac Harbour, New Brunswick	1 0	4	2		
Sandy Cape, Australia, E. Coast	7 50	6-8			Seaham, England	3 24	14½	10½		— Brunswick	8 0				
— Cove, East, Bay of Fundy	10 33	21½	17½		Seal Cove, Grand Manan, B. of Fundy	10 54	20	15		Sheephaven, Ireland	5 32	11½	8!		
— West, Bay of Fundy	10 47	23	19		Seal Id., C. Sable, Bay of Fundy	9 49	12½	10!		Shoerness, England	0 37	16	13!		
Sandy Hook, United States	7 29	5½	5		Seamount Bay, Mulroy B., Ireland	6 44	7!			Sheet Harb., Nova Scotia	8 6	6½	4!		
— Id., Madagascar, W. Coast	5 0	15			Sebastian, San, Brazil	2 0	4			Shelfeen Id., Africa, S. C.	4 40	12			
— Islet, Australia, W. Coast	10 35	18			Sebastian, Spain, N. Coast	7 0				Sheffield Island, U. States	10 58	8!	7!		
Sang-tau Bay, Yellow Sea	0 55	7	4½		— Trinidad Puego	3 0	12	9		Shelburne, Nova Scotia	8 4	7	5!		
Sanguaianga (entrance), Ecuador	4 10	9			Sebastian, Spain, N. Coast	3 0	12	9		Sheldrake Island, Gulf St. Lawrence	6 0	5	3		
Sanguir Island, Moluccas		6			Sedashigur Bay, Hindostan, W. Coast	9 44	7			Sherbro R., Africa, W. C.	6 0	11			
Sangwin R., Africa, W. C.	5 15	4			Seili R., China Sea, W. C.	3 21	17½	12		Shields, North, England	3 23	13!	10		
Sanmoon Bay (St. George Island), China, E. Cst.	10 20	15			Sein, Isle de France	7 9	9			Shihtau Bay, Yellow Sea	1 30	9	7		
San-hui, Si-kiang, China, E. Coast		5-6			Selsea Bill, England	11 45	16½	12½		Ship Harb., Nova Scotia (New Id.)	7 54	6½	4!		
Santa Catalina Id., California	9 35?	5?	4!		Semiamoo Bay, Gulf of Georgia, America, N.W. Coast	2 0	12			Falkland Islands	10 30				
Santa Cruz R., Patagonia, E. Coast	9 30	40	29		Seugal (Bar)	8 42	6			Shippigan, Gulf St. Lawrence	3 42	5½	3		
Santa Cruz or Agadir, Africa	12 45	9			— (Guet N'dar)	8 42	6			Shoal Bay, Australia, N.C. E.C.	6 0	18-25	14-20		
					— (St. Louis), Africa, W. Coast	10 0	6			Shoal Water B., Australia, E. Coast	10 30	12-18			
										Shoreham, England	11 34	18	13!		

\* Spring Tides rise A.M. 6 feet, P.M. 7½ feet from October to March; and the contrary during the rest of the year.

TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.		PLACE.	High Water, Full and Change.	RISE.	
H. M.	ft.	Spgs.	Nps.			H. M.	ft.			ft.	Spgs.			Nps.	H. M.
	2			Shushartie Bay, Vancouver Island . . .		12		Smoky Bay, Australia, S. Coast . . .	12 15	6		Stonefield (Loch Etive), Scotland . . .	7 3		
irr.	2			Si Kiang or West River, China, E. Coast . . .			5-6	Smyth Harbour, Tierra del Fuego . . .	12 0	6½		Stonelhaven, Scotland . . .	1 10	14	11
11 45	14			" (San-shui) . . .			3	Snapo Bridge, Orford, England . . .	3 0	6		Stonington, United States . . .	9 7	3½	3
2 30	8	11½		" (Shao-king) . . .			1-1½	Sococa, France . . .	3 19	12½	8½	Stornoway, Lewis Island, Scotland . . .	6 46	13	9½
				" (Wuchan) . . .				Society Bay (Sullivan Bay), Yellow Sea . . .	0 15	8		Strangford (Killard Pt.), Ireland . . .	10 53	14	11½
3 31	15			Siak River, Malacca Strait, off the town . . .	9 0	12		Socotra Id., Indian Ocean . . .	7 20	8		— Quay . . .	12 31	10½	8½
4 0	6½			Sidmouth Cape, Australia, E. Coast . . .	9 15	10		Sofala R., Africa, E. Cst. . .	4 0	19		— Head of Lough (Turley Rocks) . . .	12 44	11½	9½
6 45	2½			Sierra Leone, Africa, W. Coast . . .	7 55	8		Solitary Ids., Australia, E. Coast . . .	9 15	5	3	Streaky Bay (Blancheport), Australia, S. C. . .	1 0	5	
8 20	12	5		Sillebar R. (Bar), Sumatra . . .	6 0	4½		Solovet Road, White Sea . . .	5 0	4		Stroma, S. side, Pentland Firth . . .	9 47	9	6½
				Simidsu, Japan Sea . . .	7 30	7		Solway (Tarn Point), Scotland . . .	11 22	23	18	Stronness, Orkneys . . .	9 0	10	7½
1 40	9	8		Simoda Port, Japan Sea . . .	5 0	3-5		Sosnovai Bay, White Sea . . .	2 40	6		Stuart Island, Strait of Georgia . . .	6 0	12-14	
2 50	10			Simons Bay, Japan Sea . . .	8 30	8	6	Sosnovets, White Sea . . .	11 44	18		Sturge Passage, Strait of Georgia . . .	6 0	12	
9 20	10			Simons, St. Island, U.S. Coast of America . . .	2 44	5½	3½	Souma, White Sea . . .	6 30	5½	3½	Suadiva Atoll, Maldives . . .	1 0	4	
9 45	10			Simpson Port, N.W. Coast of America . . .	7 43	8½	6½	South Farallon, California . . .	10 37	4½	3½	Sual Port, Luzon . . .	6 0	6	
				Singapore, New Harbour, Malacca Strait . . .	0 35	21½	14½	South Rock, Ireland . . .	10 58	13	10½	Suderoe Fiord, Faeroe Ids. . .	6 0	9½	7½
9 30	6	7		Sinou, Africa, W. Coast . . .	9 45	10	7½	Southampton, England . . .	10 30	13	9½	Suez Bay (head of Gulf), Red Sea . . .	2 0	6	
0 40	10			Sir C. Hardy Ids., Torres Strait, E. Coast . . .	5 0	4		South-West Bay, New Providence . . .	7 30	4		Sughra, Arabia, S.E. Cst. . .	8 0	6	
				Sir E. Pellew Islands, Australia, N. Coast . . .	9 15	10		Zealand . . .	12 0	7	5	Sumburgh Hd., Shetland . . .	9 45		
1 0	6			Sisal, Gulf of Mexico . . .	7 30	4-7		Southernness, England . . .	11 20	23		Sunday or Raoul Island, S. Pacific . . .	6 0	5	
11 45	6			Sitka, America, N.W. Coast* . . .	0 34	5-7		Southwold, England . . .	10 20	6½	4½	Sunderland, England . . .	3 22	14½	11
12 5	5			Skaapen Fiord, Faeroe Islands: . . .				Spain, Port, Trinidad . . .	4 30	4	3	— N., England . . .	2 30	15	11½
3 0.	5			Between Stormoe and Sandoe . . .	5 0	9½	7½	Spenser's Anchorage, Bay of Fundy . . .	11 42	39	33	Supé Bay, Peru . . .	4 50	3	
4 15	3½			Between Hestoe and Sandoe . . .	5 30	9½	7½	— Bay, Africa, S.W. Coast . . .	10 50	5-6		Surat, Hindostan, W. C. . .	4 0	19	
12 45	5½			Skagen or the Skaw, Jutland . . .	5 56	1		Spenser Gulf (Thorny Passage), Australia, S. Coast . . .	12 0	6-8		Surin, St. France . . .	4 11	14½	11
5 0.	3½			Skerry, Great, E. side, Pentland Firth . . .	11 4	9½	6	— Point Lowly . . .	7 0	6-8		Surinam, Guayana . . .	6 0	5½	
				Skerry, Great, W. side, Pentland Firth . . .	10 53			— Port Augustaf . . .	8 30	9-12		Sussex Port, Falkland Ids. . .	8 15	6	
5 32	11½	8½		Skerries, Ireland, N. Cst. . .	6 15	5	3	— Point Riley . . .	5 45	4½		Sutton Pool, England . . .	5 32	15½	11½
0 37	16	13½		Skerries, E. Coast . . .	11 0	13	10	— Wallaroo . . .	irr.	4-5		Sviatoi Nos, Lapland . . .	9 15	14	
8 6	6½	4½		Skip Ness, Scotland . . .	11 50	9		Spicers Cove, B. of Fundy . . .	11 35	37	30½	Svinoc Fiord, Faeroe Ids. . .	12 0	6½	4½
4 40	12	7½		Skull, Ireland . . .	4 2	9½	7½	Spider Id., China, E. Cst. . .	10 0	17		Swain Reefs, Australia, E. Coast . . .	10 25	10	
10 58	8½	7		Slaughden, Orford, England . . .	1 0	7½		Spitzbergen (Bell Sound) . . .	8 56	3½		Swan Island, Bass Strait . . .	9 35	6	
8 4	7	5½		Slievebane Bay, Ireland, W. Coast . . .	5 49	10½	7½	Spurn Pt. (Humber R.), England . . .	5 26	18½	15	— Point, Australia, W. Coast . . .	0 10	26	
				Sligo Bay (Mullaghmore), Ireland . . .	5 18	11½	8½	Staten Island, Tierra del Fuego . . .	4 30	8		Swan River, Gage Road . . .	8 50	2½	
6 0	5	3		— Harbour, Ireland . . .	5 23	11½	8½	Stewart Harbour, Tierra del Fuego . . .	2 50	4		— Port Grey, Australia, W. Coast . . .	9 0	1-1½	
6 0	11			Slyne Hd., Ireland, W. Coast . . .	4 30	13½	10	Steaunton Id., Yellow Sea . . .	1 30	8	5½	Swansea (Mumbles Light-house), Wales . . .	6 1	27½	20½
3 23	13½	10		Smalls Lighthouse, St. George's Channel . . .	6 0	21		Steilacoom Fort, Oregon . . .	4 46	11	9½	Swatau, China, E. Coast . . .	3 0	9	
1 30	9	7		Smerwick, Ireland . . .	3 50	11½	8	Stephen Port, Australia, E. Coast . . .	9 0	6		Swift Bay, Australia, N. Coast . . .	12 0	18	
7 54	6½	4½		Smithville, United States . . .	7 19	5½	4½	— Falkland Islands . . .	7 45	7½		Swona, E. side, Pentland Firth . . .	10 24	10	7½
								Stirling, Firth of Forth, Scotland . . .	3 52	7½	4½	— W. side, Pentland Firth . . .	9 35	10	7
3 42	5½	3						Stirrup Cays, Bahamas . . .	7 0	4		Sydney, Australia, E. Cst. . .	8 38	4½	4
6 0	18-25	11-50						Stockton (Tees), England . . .	4 40	11		Sydney Har., Cape Breton . . .	9 0	5	4
8 30												Ta-tsing ho, Yellow Sea . . .	4 10	10½	8
10 30	12-18											Table Bay, Africa, W. C. . .	2 40	5	
11 34	18	13½													

\* The rise at Sitka as given by Commander Pearce, H.M.S. *Alert*, in his remarks in 1860, does not exceed 7 feet, but on the authority of Commander Pike, H.M.S. *Devastation* (1862), the local pilots say that the rise sometimes is as much as 16 feet.

† At Port Augusta, when the winds veer round to West and South, and blow strong, the rise has been as much as 16 feet.



PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Tabou R., Africa, W. Ct.	4 45				Tay-bay-oo-bay, China Sea, E. Coast	10 15	6			Towan Id., China, E. C.	9 20	13		
Tabuai Island, S. Pacific		3			Tebonkos Road, Baly. (N. Coast)	5 0	6½			Tower Id., Galapagos	?	?		
Tadeo, San, River, Patagonia, W. Coast	11 45	6			Teelin Harb., Ireland	5 16	11½	8½		Townshend Harb., Tierra del Fuego	2 30	5		
Tahiti, S. Pacific	noon	1½			Tees R. (Bar), England	3 45	15			Townshend Port, Oregon	3 49	5½	5	
Tahrif, Persian Gulf	5 0?				Teignmouth, England	6 0	13	9½		Tracadie, Prince Edward Island	7 0	3½	2	
Tai-cho ho, Yellow Sea	0 15	6			Tenby, Wales	6 0	27	20		Tracey Harbour, British Columbia	12 0	16	11½	
Tai-chow Ids., China, E. C.	9 0	14			Teneriffe, Cape Verd Ids. (Santa Cruz)			8½	6	Tracy Island, Korea, S. Coast	8 58	11½	8½	
Tai-Tai Bay, China Sea, E. Coast	9 30	5¾			Terceira, Azores	12 32	4½			Tree Islands, Norway	11 45	7		
Talcahuano, Chile	10 14	5			Teriberka R., Lapland	7 20	12			Trawlreaga Lough, Ireland	6 10	11½	8½	
Talcan Island, Patagonia, W. Coast	1 3	15½			Terschelling (West), Netherlands	8 40	6	5		Tréguier, France	5 32	25	16½	
Tailung Channel, Canton River, China	1 30	6½			Tetrina, White Sea	3 17	7			Trek Island, White Sea	10 48	20		
Ta-lien-whan Bay, Yellow Sea	10 47	10½	8		Tetuan, Africa, N. Coast	2 23	2½	1½		Trepassey, Newfoundland	7 0	6½	5	
Tama no Ura Harbour, Goto Id., Japan Sea		6-8	4-6		Texel (outside Shoals), Netherlands	6 30	4	3½		Treport, France	11 9	27	21	
Tam-Sui Harbour, China Sea, E. Coast	11 45	7-12			Thirsty Sound, Australia, E. Coast	10 45	12-18			Tres Cruces Point, Patagonia, W. Coast	1 15	16		
Tamar R., George Town, Tasmania	12 5	10	7½		Thomas St., Id., Africa	3 25	4½			Triangles, Gulf of Mexico		1½		
Tamar R., Launceston, Tasmania	1 0	12½			Thompson St., New Zt.	11 30	8	6		Trincomalie Har., Ceylon, S. Coast	8 18	2	1½	
Port, Magellan Strait	3 5	5			Thorny Passage, Spencer Gulf, Australia, S. C.	12 0	6-8			Tringano R., G. of Siam, China Sea, W. Coast	8 0	7		
Tamatave, Madagascar, E. Coast	4 18	8			Thorsminde, Jutland	3 34	2			Trinidad (Port Spain), Caribbee Islands	4 30	4	3	
Tampa Bay, United States	11 21	1¾	1½		Three Hummock Island (E. side), Bass Strait	10 30	10			Trinity Bay (Bull Island), Newfoundland	7 22	3½	2	
Tanabé, Ki Channel, Japan Sea	6 0	6	5½		Three Kings' Islands, New Zealand	8 0	7			Harbour, Newfoundland	7 10	3½	2	
Tanera, Summer Islands, Scotland	6 27	14-	10½		Three Rivers, River St. Lawrence	11 30	1			Opening, Great Barrier Reefs	9 15	7-12		
Tangier, Africa, N. Coast	1 42	8			Throgs Point, U.S.	11 20	9½	7½		Tristan d'Acunha, South Atlantic		8		
Tautang Harbour, Madagascar, E. Coast	4 30	6			Thurso, Scotland	8 28	14¾	11		Triton Harbour, Newfoundland	7 0?	2-4?		
Tanjong Api, China Sea		7			Ticao Island (Port San Jacinto), Filipinas	6 30	6			Tromsø, Norway	1 45	8		
Tanjong Bolus, Malacca Strait	9 30	10½	8½		Tictoc Bay, Patagonia	1 45	11			Troon, Scotland	11 50	10	7½	
Tanna, New Hebrides	5 35	3			Tien-pak Harb., China, East Coast	12 0	8½			Troubridge Shoals, Australia, S. Coast	3 30	6		
Tappanmook, U. States	0 42	2	1½		Timballier Bay, G. of Mexico	irr.	2			Truro, England (Town Quay)	5 5	10	6	
Tappanooly Harbour, Sumatra	6 10	6			Tinghae, Chusan, China, E. Coast	11 0	12	9		Tsang-chow Island, Bias Bay, China, E. Coast	8 30			
Taraniki or New Plymouth, New Zealand	9 30	12	9		Tobago, Caribbean Sea	irr.	3½			Tsau-liang-hai or Chosan Harbour, Japan Sea	7 45	7	5	
Tarbert, Ireland	4 57	14½	10½		Tobermory, Isle of Mull	5 36	13	9½		Tsu-sima Sound, "	8 30	8	6	
Tarifa, Spain	1 46	6	3½		Tolooe Ali Point, Banka Strait	8 30PM	12			Tsungar Strait, "	5 0	5		
Tarn Pt., Solway, Scotland	11 22	23	18		Tomo (Seto-uchi), Japan Sea	11 0?	5			Tudwall, St., Road, Wales	7 45	14		
Tarpanlin Cove, United States	8 4	2¾	2½		Tongatabu, S. Pacific	6 50	4			Tumaco Road, Ecuador	2 33	12		
Tarrytown, United States	9 57	4	3½		Tongsang Harb., China, E. Coast	11 30	12			Tunis, Mediterranean		3		
Tatamagouche, Nova Scotia	10 0	8	5		Tonning, Germany	2 1	9			Turks Islands, Bahamas		3		
Tatuyama Bay, Japan Sea	5 50	5			Tooniang Id., Bias Bay, China, E. Coast	8 0				Turna Bay, White Sea	9 54	11		
Tauranga Harbour, New Zealand	7 10	6	4½		Topaze Harbour, British Columbia	3 0	16	11½		Turner C., Prince Edwd. Island	6 10	4	2	
Tavoy R. (entrance), Bay of Bengal, E. Coast	10 30	20			Torbay, England	6 0	13½	10		Turon B., Cochin China	3 0	4		
Tay River (Bar), Scotland	2 6	16	14		Toro Point, Chile	9 45				Turtle Island (North), Australia, W. Coast	11 0	18		
					Tortola, Virgin Islands	8 30	1½			Tuticorin Harbour, G. of Manaar, B. of Bengal, W. Coast	1 15	2½	1½	

\* In S. E. Monsoon.

† In N. W. Monsoon.



## TIDE-HOURS OF THE PORTS AND HARBOURS OF THE WORLD.

PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.		PLACE.	High Water, Full and Change.		RISE.	
	H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.		H. M.	ft.	Spgs.	Nps.
Westness, Orkneys . . . . .	9 11	10		7½	Wivenhoe, Colne River, England . . . . .	12 10	15	10		Yarmouth Haven (Brush), England . . . . .	10 9	16	5¾	4½
Weston-super-mare, England . . . . .	6 54	37	28½		Wolstenholm Snd., Arctic Regions . . . . .	11 8	7½			Bay of Fundy, Bridge, England . . . . .	9 15	6	5	4
Westport, Ireland . . . . .	4 57	12½	9½		Woodbridge or Bawdsey Haven (Bar), England (Kingston Quay), England . . . . .	11 45	12	9		Road, England . . . . .	10 0	6	7	6½
Wexford, Ireland . . . . .	7 21	5	3½		Woodbridge (Wilford Bridge), England . . . . .	0 35	10			Isle of Wight, England . . . . .	12 0	6	7	6½
Whampoa, { In March . . . . .	1 40				Woodlark Id., Louisiade Archip. . . . .	0 55	7			Yealm River, Bigbury Bay, England . . . . .	5 37	16½	11½	
{ In April . . . . .	1 15				Woods Hole (entrance from Vineyard Sound), United States . . . . .	7 15	4			Yedo Bay (Yoku-hama), Japan . . . . .	6 0	6½	4½	
China { In May & June . . . . .	0 30				Woody Island, Australia, E. Coast . . . . .	9 14	10	7		Yellaboi, Africa, W. Cst. . . . .	7 10	10		
Whitby, England . . . . .	3 45	15	11½		Woolwich, England . . . . .	1 37	18½	15½		Yeun, Ile d', France . . . . .	3 6	14½	10	
White Dog Ids., China, E. Coast . . . . .	9 0	18			Workington, England . . . . .	11 4	20	15		Ylo Road, Peru . . . . .	8 15	6		
Whitehaven, England . . . . .	11 14	23½	18½		Wrabness, Stour River, England . . . . .	12 29	12			Yoku-hama, Yedo Bay, Japan Sea . . . . .	6 0	6½	4½	
Wick, Scotland . . . . .	8 0	6½	4½		Wranger Oog, Germany . . . . .	12 0	9			York C., Australia, East Coast . . . . .	11 15	10	7	
Wicklow, Ireland . . . . .	10 29	9	6½		Wrath Cape, Scotland . . . . .	7 30	15½			Factory, Hudson Bay Coast . . . . .	11 15	10-14		
Wide Bay, Australia, E. Coast . . . . .	9 14	10	7		Wreck Reef (Bird Islet), Australia, E. Coast . . . . .	8 3	6			River (Moody's Wharf), United States . . . . .	9 35	3½		
Widewall, Orkneys . . . . .	9 3	10	7½		Wuchu, Si Kiang, China, E. Coast . . . . .	1-1½				Road, Magellan St. . . . .	2 0	9		
Wigton, Scotland . . . . .	11 30				Wusun River (entrance), Yang-tse-Kiang, China, E. Coast . . . . .	0 30	15	10½		Youghal, Ireland . . . . .	5 14	12½	10	
Wilberforce Cape, Australia, N. Coast . . . . .	8 10	10			Wynkoops Bay, Java . . . . .	5 0	4½	4		Yung R., Chinhae, China, E. Coast . . . . .	11 20	12½		
William Port, Falkland Islands . . . . .	5 15	7	5½		Yang ho, Yellow Sea . . . . .	0 15	3			Yung-hing Bay, Japan S. . . . .	5 20	2½		
—, N. Zealand . . . . .	12 45	8	6		Yang-tse Kiang (Light Ship at entrance), China, E. Coast . . . . .	12 0	15	10		Yura Harbour, Japan Sea . . . . .	6 5	6½		
—, Scotland . . . . .	11 10	18	10		— (Pheasant Point) . . . . .	0 35	13	8		Zambezi Riv. (Pearl Id.), Africa, E. Coast . . . . .	4 30	12-15		
Willis Islets, Australia, E. Coast . . . . .	8 0	6			— (Chaunnel), Africa, E. Coast . . . . .	0 35	13	8		Zanzibar, Africa, E. Cst. . . . .	5 20	10		
Willoughby Cape, Kangaroo Id., Australia . . . . .	4 10	6			ca, E. Coast . . . . .	4 15	11			Zaudzi, Mayotta, Ccmoro Islands . . . . .	4 10	12		
Wilmington, U. States . . . . .	9 6	3	2½		Zebú Port, Filipinas . . . . .	12 0	7			Zeyla, Africa, E. Coast . . . . .	7 15	8½		
Wilson Promontory, Australia, S. Coast . . . . .	2 0	10			Zieriksee, Netherlands . . . . .	2 0	11	9						
Winter Harbour, Melville Island . . . . .	1 30	3½												
Winterton Ridge, England . . . . .	7 50													
Wisbeach, England . . . . .	7 30	15												
Wisbeach Eye, England . . . . .	20													

THE END.

# INDIAN OCEAN DIRECTORY.

## THE SEAMAN'S GUIDE

TO THE

# Navigation of the Indian Ocean, China Sea, and West Pacific Ocean;

Including a Description of the Winds, Storms, Tides, Currents, &c. &c.

### SAILING DIRECTIONS

*For the Principal Ports on the South and East Coasts of Africa, in the Arabian Sea and the Bay of Bengal, and on the West and South Coasts of Australia;*

TOGETHER WITH A FULL ACCOUNT OF ALL THE ISLANDS:

ALSO, NOTES ON MAKING PASSAGES DURING THE DIFFERENT SEASONS.

*Extensively Illustrated with Wind, Current, and Track Charts; Plans of Harbours, Charts of Islands, &c. &c.*

By W. H. ROSSER, AND J. F. IMRAY, F.R.G.S.

PRICE TWENTY-FIVE SHILLINGS.

**T**HIS Work is in Two Parts—one devoted to those Physical Phenomena, the study of which is now so inseparably connected with the Science of Navigation; the other being a description of, and Sailing Directions for, the Ports, Harbours, and Islands of the Indian Ocean.

**PART I.** comprises more than a general description of the **AIR** and the **OCEAN**. It enters with considerable detail into the Distribution of the Winds and Seasons (Monsoons), and gives a full account of Cyclones, and their development in both Hemispheres—embracing every department of Meteorological Science in its relation to Navigation. Next follow the Tides, with an Alphabetical List of Places, giving the Times of High Water at Full and Change of the Moon. The Currents are mighty agents in the acceleration or retardation of a voyage; these, therefore, are largely dwelt on, and their strength and approximate boundaries in the Indian Ocean and China Seas defined. The region of Ice and Icebergs, the Northern limit of these dangers to Navigation, and the parts of the Southern Indian Ocean where they may be expected in the greatest numbers, appropriately find a place here. The Specific Gravity and Temperature of the Water, together with Deep Sea Soundings, are subjects that have not been forgotten; a brief survey of Whaling Grounds is given, and then this part closes with a short account of the Magnetism of Iron Ships.

In selecting the materials for **PART II.**—the **SAILING DIRECTIONS**—every recognised authority (English and French) has been examined; and the names of Marine Surveyors and Harbour Masters, in many instances already familiar to the Seaman, but too numerous to mention in this place, will be found appended to the information furnished by each. As regards the description of, and directions for, the South Coast of Africa, the Islands, and the east side of the Bay of Bengal, these have been carefully and exclusively compiled by Mr. J. F. IMRAY, F.R.G.S., and are probably more extensive than in any other work relating to the same places.

An extensive Catalogue of all the Doubtful Dangers, Vigias, and reported Shoals follows the Sailing Directions. The important question of How and Where to make a Passage at any given time of the year, is fully discussed, and instructions, with instances, given on the subject.

**SHORT NOTES AND SAILING DIRECTIONS, with Remarks on Making Passages;  
TO ACCOMPANY A CHART OF THE NORTH ATLANTIC.**

By W. H. ROSSER.

PRICE ONE SHILLING AND SIXPENCE.

**SHORT NOTES AND SAILING DIRECTIONS, with Remarks on Making Passages;  
TO ACCOMPANY A CHART OF THE SOUTH ATLANTIC.**

By W. H. ROSSER.

PRICE ONE SHILLING.

LONDON:

Published by **JAMES IMRAY & SON,**

CHART PUBLISHERS AND NAUTICAL BOOKSELLERS,  
MINORIES, AND TOWER HILL.

High Water, Full and Change.	RISE.	
	Spgs.	Nps.
I. M.	ft.	ft.
10 9	5 $\frac{3}{4}$	4 $\frac{1}{4}$
	16	13
	5	4
9 15	6	4
10 0	7	6 $\frac{1}{2}$
12 0		
5 37	16 $\frac{1}{4}$	11 $\frac{1}{2}$
6 0	6 $\frac{1}{4}$	4 $\frac{1}{4}$
7 10	10	
3 6	14 $\frac{1}{4}$	10
8 15	6	
6 0	6 $\frac{1}{2}$	4 $\frac{1}{4}$
11 15	10	7
11 15	10-14	
9 35	3 $\frac{1}{2}$	
2 0	9	
5 14	12 $\frac{3}{4}$	10
11 20	12 $\frac{1}{4}$	
1 0	9	
5 20	2 $\frac{1}{2}$	
6 5	6 $\frac{1}{4}$	
4 30	12-15	
5 20	10	
4 15	11	
4 10	12	
12 0	7	
7 15	8 $\frac{1}{2}$	
2 0	11	9

BRIEF INSTRUCTIONS  
ON  
**FINDING A SHIP'S POSITION AT SEA**

By Two Altitudes of any Celestial Object, and Bearing of the Land from a Single Observation;

By W. H. ROSSER.

PRICE ONE SHILLING AND SIXPENCE.

ALSO, BY THE SAME AUTHOR, A

**SHORT & CONCISE METHOD OF FINDING LATITUDE, LONGITUDE, & AZIMUTH,**

*By Simultaneous Altitudes of Stars, and by Double Altitudes of the Sun.*

PRICE ONE SHILLING AND SIXPENCE.

---

**A GENERAL ATLANTIC DIRECTORY,  
NORTH AND SOUTH,**  
ILLUSTRATED WITH CHARTS, DIAGRAMS OF THE WINDS, CURRENTS, ETC.

By W. H. ROSSER.

PRICE FIFTEEN SHILLINGS.

N.B.—This Work may be had in two parts—or each part separately, viz., A NORTH ATLANTIC DIRECTORY, with Sailing Directions for all the *Ports of Call*, &c. Price 10s. 6d.; and a SOUTH ATLANTIC DIRECTORY, with Sailing Directions, Price 6s.

---

**HANDBOOK TO THE ORDINARY AND EXTRA EXAMINATIONS.**

*This Edition contains a Chart of the Stars and the New Examination on Flags.*

---

**A SELF-INSTRUCTOR  
IN  
NAVIGATION and NAUTICAL ASTRONOMY.**

*WITH CHART, DIAGRAMS OF THE LIGHTS FOR THE RULE OF THE ROAD, AND  
NUMEROUS ILLUSTRATIONS.*

By W. H. ROSSER,

AUTHOR OF "NOTES ON THE SOUTH ATLANTIC," ETC.

PRICE SEVEN SHILLINGS AND SIXPENCE.

This Work on Navigation and Nautical Astronomy introduces the subject to the Seaman in the order in which it is required for the several grades of Certificates at the LOCAL MARINE BOARD EXAMINATIONS; it contains, at the commencement of each Special Rule, introductory and subordinate computations for his guidance in the various methods of determining a Ship's Position at Sea—Latitude and Longitude—and of finding the Variation and Deviation of the Compass; and that it may be the more thoroughly practical, *complete solutions of every variety of Problem are given*, so that it will be found equally useful for all the requirements of sea service as an Epitome of Navigation, being a companion to any set of Mathematical Tables.

---

LONDON:

Published by **JAMES IMRAY & SON,**

CHART PUBLISHERS AND NAUTICAL BOOKSELLERS,  
MINORIES, AND TOWER HILL.

EA

Observation;

AZIMUTH,

ENTS, ETC.

ory, with Sailing  
ctions, Price 6s.

NATIONS.

ys.

NOMY.

D, AND

er in which it is  
at the commence-  
methods of deter-  
of the Compass;  
so that it will be  
mion to any set of

# CATALOGUE

OF THE

LATEST AND MOST APPROVED

Charts, Pilots', and Navigation Books;

SOLD OR PUBLISHED BY

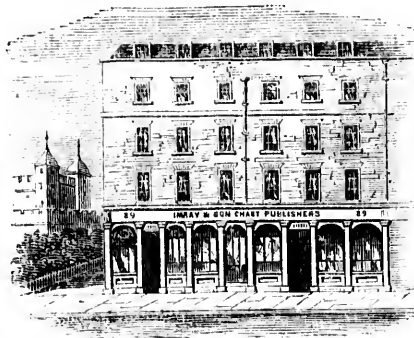
JAMES IMRAY AND SON,

CHART PUBLISHERS,

AND

MANUFACTURERS OF NAUTICAL INSTRUMENTS,

No. 59, MINORIES, AND TOWER HILL, LONDON.—[E.]



Established 1763.

MAY BE HAD AT EVERY SEAPORT IN THE UNITED KINGDOM, AND AT  
NUMEROUS FOREIGN PORTS.

1866.

## ADDRESS.

---

IN introducing our new Catalogue, we avail ourselves of the opportunity to express our best thanks to our numerous Correspondents and Nautical Friends, for the kind patronage with which they have hitherto favoured us, and for the very valuable and useful information we are constantly receiving from them. The high estimation accorded to our publications for their accuracy, is chiefly to be attributed to the assistance so received, and on this ground we are always ready and happy to receive suggestions tending to the improvement of any of our Works.

At the present time many hydrographical surveys are being carried on, not only by our own Government, but by the Governments of Foreign Countries, and it may be expected that the intelligence and skill of surveyors, furnished with superior instruments, will materially extend our knowledge of important coasts and seas, annually becoming more and more frequented by our mercantile navy. It has always been our great aim to keep pace with the rapid advance of hydrographical science, and to introduce to the nautical world, as early as possible, the most recent additions and improvements in every department; consequently, we flatter ourselves that for accuracy and extent of information our numerous publications cannot be surpassed. Everything new and valuable to the navigator is immediately embodied in our Charts and Sailing Directions, and will continue to be so, in order that the high character our works have already acquired for correctness and utility may be fully maintained.

\* \* CORRESPONDENTS, when giving orders, are particularly requested to refer to the present, instead of to any former Catalogue; and, in addition, if they write down the number, leading words, and price of each article, it may prevent mistakes.

Cash remittances are required to accompany the first order.

Where measurement is given of Charts fitted for the Counting House, the first dimension is the width, and the second the length hanging down.

# CATALOGUE

OF

## CHARTS AND NAUTICAL WORKS.

### *Charts of the World, and Track Charts.*

1. **THE WORLD, on Mercator's Projection**, on four sheets, compiled from the latest surveys and astronomical observations, including the discoveries of all our recent Navigators and Travellers, Parry, Ross, Back, Franklin, Lyon, Richardson, Scoresby, Clavering, Denham, Clapperton, Freycinet, &c. &c. This publication, embracing the twofold properties of Chart and Map, will be found equally useful to the mariner and merchant, and is well adapted as an embellishment to a counting-house, cabin, or library. Price, in sheets, or lined with blue paper ... .. 16s. 0d.  
 On cloth for Captains' use ... .. 21s. 0d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 9 in. by 3 ft. 7 in. ... .. 21s. 6d.
2. **A CHART or Map of the WORLD**, on Mercator's Projection, reduced from the preceding one, on one sheet. A scale is given on this chart for the exact measurement of distances, in every direction, without those inconvenient appendages which have sometimes been annexed to works of this description; 41 in. by 27 in. ... .. 7s. 6d.  
 On cloth for Captains' use ... .. 8s. 9d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 41 in. by 27 in. ... .. 16s. 0d.
3. **THE WORLD.** An outline chart intended for the purpose of marking off a ship's track. On three sheets ... .. 12s. 6d.  
 On cloth for Captains' use ... .. 15s. 9d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
- This Chart has the Great Circle Tracks marked upon it, and is very useful to travellers proceeding abroad, as with its assistance they will be enabled to keep a daily record of the ship's progress towards the port of destination. Useful also for a Ship and Insurance Broker's Office.
4. **ENGLAND to BRAZIL.** An outline chart intended for the purpose of marking off a vessel's track between England and the River Plate or Cape of Good Hope ... .. 5s. 0d.  
 On cloth for Captains' use ... .. 6s. 3d.



## *The Coasts of England, Ireland, and Scotland.*

5. **ENGLISH CHANNEL**, on the largest scale yet published. With plans of the Downs, Falmouth, Portland, Plymouth, the Needles Channel, Alderney, Dungeness, Dartmouth, Salcombe, &c. &c. Compiled from the most recent British and French surveys. On three sheets. Accompanied with a book of Sailing Directions ... .. 12s. 0d.  
On cloth for Captains' use ... .. 15s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
6. **ENGLISH and BRISTOL CHANNELS**, with the south coast of Ireland to the River Shannon. On three sheets. With numerous plans of harbours. Accompanied with a Book of Directions. ... .. 12s. 0d.  
On cloth for Captains' use ... .. 15s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
7. **Eastern Portion of the ENGLISH CHANNEL**, on two sheets, showing the navigation eastward of Beachy Head, or long. 0° 10' E., and exhibiting the Strait of Dover on a very large scale. With numerous plans of harbours. Illustrated with views of the coast. Scale 19½ in. to 1° of Longitude. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.  
On cloth and rollers, coloured and varnished ... .. 20s. 0d.
8. **THREE CHANNEL CHART**. This chart shows the whole navigation from Hull and London to Bristol, Liverpool, Dublin, Cork, and Galway. It contains plans of the principal harbours, is illustrated with numerous views of the coast, and accompanied by a Book of Sailing Directions ... .. 16s. 0d.  
On cloth for Captains' use ... .. 21s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 6 in. by 4 ft. 3 in. ... .. 40s. 0d.
9. **Rivers THAMES and MEDWAY**, on a very large scale, extending from Sea Reach to Orfordness and the Downs, and containing plans on an extended scale of the River Medway, River Thames to London, Harwich Harbour, and Queen's and Prince's Channels. On two sheets. Drawn from the surveys made by Commanders Bullock, Hewett, R.N., &c. &c. Illustrated with views of the coast, and accompanied by a Book of Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 3d.  
On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 20s. 0d.
10. **RIVER THAMES**, from Ramsgate and Orfordness to the Nore. One sheet. 4s. 0d.  
On cloth for Captains' use ... .. 5s. 3d.
11. **RIVER THAMES and STRAIT of DOVER**, showing the entire navigation from Orfordness and London to Beachy Head. With large plans of Harwich, Ramsgate, Folkestone, Dover, Calais, and Boulogne Harbours. On two sheets. Accompanied with a Book of Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.  
On cloth and rollers for Counting-house, coloured and varnished; size 3 ft. 5 in. by 4 ft. 4 in. ... .. 20s. 0d.

*Minorities, London.*

12. **STRAIT of DOVER**, showing the south-east coast of England from Ramsgate to Beachy Head, and the opposite coast of France from Calais to Boulogne. With plans of Ramsgate, Dover, Folkestone, Calais and Boulogne Harbours. Illustrated by numerous views of the coast. The scale is very large, being 19 $\frac{1}{2}$  in. to 1° of Longitude. One sheet ... .. 4s. 0d.  
On cloth for Captains' use ... .. 5s. 3d.
13. **SCILLY ISLANDS**, on a large scale, and illustrated with some views. Drawn principally from the surveys of Mr. G. Spence. One sheet ... .. 4s. 0d.  
On cloth for Captains' use ... .. 5s. 3d.
14. **BRISTOL CHANNEL**, extending from Hartland Point and the Smalls to Bristol and Gloucester. On three sheets. Drawn from the surveys made by Commanders Robinson, R.N., Denham, R.N., Sheringham, R.N., and Aldridge, R.N., accompanied with a Book of Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.  
On cloth and rollers for Counting-house, coloured and varnished; size 5 ft. 2 in. by 3 ft. 3 in. ... .. 26s. 0d.
15. **IRISH or St. GEORGE'S and BRISTOL CHANNELS**, on a very large scale, extending from Trevoose Head in Cornwall to the Firth of Clyde, with plans of Holyhead Bay, Tuskar Rocks, Lundy Island, South Coast of Man, North Rocks near Belfast, Milford Haven, River Clyde, Belfast Bay, Douglas Bay, and entrance to Loughs Foyle, Strangford, and Carlingford; and illustrated with numerous views of the coast, lighthouses, beacons, &c. On three sheets. Drawn from the surveys of Captains Boechey, Denham, Mudge, Robinson, Williams, Frazer, and Sheringham, &c. &c. accompanied with a Book of Directions ... .. 12s. 0d.  
On cloth for Captains' use ... .. 16s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
16. **IRELAND (The West, South-West, and North Coasts of)**, from Waterford to Lough Foyle, on the same scale as the chart of the St. George's Channel. No. 15, preceding; containing plans of the harbours of Waterford, Cork, Valentia, Youghal, Bantry, Bear-Haven, Galway, Sligo, Newport, Westport, the River Shannon, and the anchorage within the Gola Islands. On three sheets. Compiled from the latest surveys, and illustrated with numerous views of the coast. Accompanied with a Book of Directions. A beautifully engraved and elegant chart ... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
17. **NAVIGATION round IRELAND**, with numerous plans of harbours. With Sailing Directions ... .. 12s. 0d.  
On cloth for Captains' use ... .. 17s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished ... .. 30s. 0d.  
Or it may be had in two parts, thus—
- 17a. **Irish Channel**. With plans of Belfast, North Rocks, Maidens, &c., Tuskar Rocks, Skerries Rocks, &c., Milford Haven, South Coast of Man, and Entrance to Lough Foyle. Accompanied with a Book of Directions ... .. 7s. 0d.  
On cloth for Captains' use ... .. 9s. 6d.
- 17b. **West Coast of Ireland**. With plans of Clew Bay, Broadhaven, Killala Bay, Killybegs, Sligo Harbour, Teelin Harbour, Kinsale, Galway Harbour, Trillick Bay, Valentia Harbour, and Crookhaven. Accompanied with a Book of Directions ... .. 7s. 0d.  
On cloth for Captains' use ... .. 9s. 6d.

\* This publication has hitherto been presented as one chart, but its size being very inconvenient, this new publication has been arranged in two charts. An advantage which follows from this is, that we are enabled to give more plans of harbours than hitherto.

- 18. APPROACHES to the FIRTH OF CLYDE and NORTH CHANNEL,**  
on two large sheets, showing the navigation along the north coast of Ireland,  
and from the Irish Channel to Glasgow and Greenock. Drawn from the late  
Admiralty surveys, and improved by remarks on some of the most important  
harbours, on two sheets ... .. 10s. 0d.  
On cloth for Captains' use ... .. 12s. 6d.  
On cloth and rollers for Counting-house, coloured and  
varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 21s. 0d.
- 19. ENGLAND (East Coast of), from Dungeness to the River Tyne,**  
with plans on a large scale of the River Humber, Yarmouth Roads, Bridlington  
Bay, River Tyne, Hartlepool, Sunderland, &c. On four sheets. Illustrated with  
numerous views of the coast. With a book of Sailing Directions ... .. 12s. 0d.  
On cloth for Captains' use ... .. 17s. 0d.  
On cloth and rollers for Counting-house, coloured and  
varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
- 20. ENGLAND (East Coast of), from Dungeness to Flamborough Head,**  
with plans of Yarmouth Roads, Bridlington, and the River Humber. On  
three sheets. With a Book of Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.  
On cloth and rollers for Counting-house, coloured and  
varnished; size 6 ft. 6 in. by 2 ft. 10 in. ... .. 30s. 0d.
- 21. ENGLAND (East Coast of), from Orfordness to Flamborough Head,**  
with plans of the River Humber, Yarmouth Roads, and Bridlington Bay, and illus-  
trated with views of the coast. On two sheets. Accompanied with a Book of  
Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.  
On cloth and rollers for Counting-house, coloured and  
varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 20s. 0d.
- Note.—This chart and the chart of the Estuaries of the Thames, No. 11, will show the navigation  
from Dover and London to Hull, on a very large scale.
- 22. ENGLAND (East Coast of), from Orfordness to Flamborough Head,**  
defining Yarmouth Roads, Hasborough Gat, Sheringham Shoals, Blakeney  
Harbour, the Dudgeons and Dowsings, Lynn Deep and the Humber, with plans  
of Yarmouth Roads and the River Humber. On one sheet. Drawn from the  
survey made by Captains Hewett and Washington, R.N. ... .. 4s. 0d.  
On cloth for Captains' use ... .. 5s. 3d.
- 23. EAST COAST OF ENGLAND, from Orfordness to the River Tyne,**  
with plans on a large scale of the River Humber, Yarmouth Roads, Bridlington  
Bay, Sunderland, Whitby, Scarborough, Hartlepool, and the River Tyne. On  
three sheets. With descriptive notes of the harbours, headlands, &c., and  
numerous views of the coast. Accompanied by a Book of Sailing Directions.  
... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.  
On cloth and rollers for Counting-house, coloured and  
varnished; size 6 ft. 6 in. by 3 ft. 5 in. ... .. 31s. 6d.
- Note.—This chart, with Nos. 9, 10, or 11, will show the navigation from London or the Downs to  
Newcastle on a very large scale.
- 24. YARMOUTH and LOWESTOFT ROADS.** A small plan chart showing  
all the leading marks, lights, &c. ... .. 1s. 0d.
- 25. ENGLAND and SCOTLAND (East Coasts of), from Flamborough  
Head to Cape Wrath and the Orkneys,** with plans of Earn Islands, Sunderland,  
River Tyne, Cromarty, Pentland Firth, Hartlepool, Scarborough, Whitby,

- Montrose, Arbroath, Peterhead, Fraserburgh, Banff, Macduff, Aberdeen, and Wick. On three large sheets. With a Book of Directions ... 10s. 6d.  
 On cloth for Captains' use ... 14s. 3d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... 31s. 6d.
26. **ENGLAND and SCOTLAND (East Coasts of), from Flamborough Head to the Orkney Islands**, with plans of Sunderland, Peterhead, Leith, and Hartlepool Harbours, the entrance to the River Tyne, &c. Improved by a full description of the signals exhibited at Sunderland and Hartlepool. Compiled from the most recent surveys. One sheet ... 4s. 0d.  
 On cloth for Captains' use ... 5s. 3d.
27. **COAL PORTS of YORKSHIRE, DURHAM, and NORTHUMBERLAND**, with plans on a large scale of the Rivers Tees and Tyne, the Ports of Sunderland, Hartlepool, Whitby, Scarborough, and Blyth, with Coquet Island Road. One sheet. Drawn from the surveys of Commanders Hewett, Slater, and Washington, R.N. Illustrated with views of the Lighthouses, &c. &c. 5s. 0d.  
 On cloth for Captains' use ... 6s. 3d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 41 in. by 27 in. ... 13s. 0d.
28. **FIRTHS of FORTH and Tay**, on a very large scale, with plans of harbours. This chart contains many valuable remarks on the Tides and Currents, and has coloured drawings of the Tidal Signals at Leith, Granton, and Dundee. Compiled principally from the late Admiralty Surveys. One sheet. Accompanied by a Book of Sailing Directions ... 5s. 6d.  
 On cloth for Captains' use ... 6s. 9d.
29. **WEST COAST and ISLANDS of SCOTLAND**, on three large sheets, showing the whole coast from the Mull of Cantyre to Cape Wrath and the Lewis Islands. On three sheets. With plans of harbours. Accompanied by a Book of Directions ... 12s. 0d.  
 On cloth for Captains' use ... 15s. 9d.
30. **NORTH COAST of SCOTLAND**, from Cape Wrath to Pentland Firth, including the Orkney Islands. One sheet. ... 5s. 0d.  
 On cloth for Captains' use ... 6s. 3d.
31. **SEA NORTH-WEST of the BRITISH ISLANDS**, on two large sheets, including plans of the Caledonian Canal and Rockall Bank. This chart is specially adapted to the use of Shipmasters frequenting the Rockall Bank in pursuit of the Fishery, as it shows the Bank on a large scale. Limits, latitudes, 53° 50' and 63° 35' N., and longitudes, 0° 30' and 15° 40' W. ... 8s. 0d.  
 On cloth for Captains' use ... 10s. 6d.
32. **WEST COASTS of the BRITISH ISLANDS**. The same chart as No. 31 (Sea north-west of the British Islands), but with an additional sheet, thus showing the whole of the Irish Channel, the coast round Ireland, the Bristol Channel, and the English Channel west of the Isle of Wight. This chart exhibits the navigation west of the British Islands between the English Channel and the Ferroe Islands. Limits, latitudes 48° 20' and 63° 35' N., and longitudes 0° 30' and 15° 40' W. - On three sheets ... 10s. 6d.  
 On cloth for Captains' use ... 14s. 3d.
33. **FÆROE ISLANDS to the BAY of BISCAY**. In four large sheets. 12s. 0d.  
 On cloth for Captains' use ... 17s. 0d.

## *Northern Navigation, comprising the North Sea, Kattegat, Baltic, &c.*

34. **NORTH SEA**, on two large sheets, showing the navigation between the coasts of England and Scotland, and the opposite coasts of France, Holland, Jutland, and Norway. With plans of harbours. Illustrated with numerous views of the Lighthouses. Accompanied by a Book of Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.
35. **NORTH SEA**. The same chart as the preceding, but with the addition of a half sheet to show the coast of Norway as far as Drontheim. Illustrated with numerous views of the coast, and improved by a full description of the Currents, Tides, &c., and remarks on the passage across the North Sea. Accompanied by a Book of Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.
36. **SOUTHERN PART of the NORTH SEA** from Dungeness to Flamborough Head on the English side, with the opposite coasts of France, Holland, &c., from Calais to Hamburg. With a large plan of the Flemish Banks. On three sheets. Accompanied by a Book of Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.  
On cloth and rollers for Counting-house, coloured and varnished; size 5 ft. 2 in. by 3 ft. 3 in. ... .. 26s. 0d.
37. **NORTH COAST of HOLLAND**, from the Texel to Hamburg, showing the entrances to the Rivers Elbe, Weser, Ems, Jahde, and Hever. Drawn from the latest surveys, and much improved by the introduction of descriptive notes, &c. &c. On 1½ sheet. Accompanied with a Book of Directions ... .. 7s. 0d.  
On cloth for Captains' use ... .. 9s. 6d.  
On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 10 in. by 2 ft. 3 in. ... .. 18s. 0d.
38. **Rivers Ems, Weser, Elbe, and Hever**, being one sheet of the above chart. ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
- 39.\* **SKAGGERAK, or SLEEVE**, extending from the Naze of Norway to Gothenburg, on a large scale. With plans of the harbours of Christiansand, Kragero, Osterrisor, Laurvig, Arendal, Winga Sound, Christiania and Christiania Fiord. Illustrated with numerous views of Beacons and Headlands On two sheets. ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.
- 40.\* **KATTEGAT**, on a very large scale, showing the navigation between the Skaw and Elsinore. Compiled from recent Danish surveys. On two sheets. Illustrated by numerous views of the coast, and accompanied by a Book of Sailing Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.
41. **KATTEGAT, SOUND, and BELTS**, with plans on a large scale of the Sound and Grounds, part of the Great Belt, Lamsbacka Fiord, and Wøderoc Anchorage. On two and a half sheets. Drawn from the most recent Danish and Swedish surveys, accompanied with a Book of Sailing Directions ... .. 8s. 6d.  
On cloth for Captains' use ... .. 12s. 3d.  
On cloth and rollers for Counting-house, coloured and varnished; size 5 ft. 3 in. by 2 ft. 10 in. ... .. 22s. 6d.
- 42.\* **SOUND and GROUNDS**, on a large scale, with plans of the Drogden and harbour of Elsinore, illustrated with views of the principal Churches, the Observatory, and other objects in Copenhagen, deduced from the most recent surveys. One sheet ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.  
On cloth and rollers for Counting house, coloured and varnished; size 41 in. by 27 in. ... .. 13s. 0d.

- 43.\* **BALTIC or EAST SEA**, on a very large scale, showing the navigation from the Sound to the Gulf of Finland and Gulf of Bothnia. With plans of harbours. Drawn from the latest surveys made by order of the Governments of Prussia, Sweden, Denmark, and Russia. On two sheets. Accompanied with a Book of Directions ... .. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 21s. 0d.
- 41.\* **GULF of BOTHNIA**, on 2½ large sheets. With plans of the North Quarken and the harbours of Gamla Carleby, and Hudiksvall. Compiled from the recent surveys made by order of the Swedish Government. Accompanied by a Book of Directions ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 14s. 3d.
- 45.\* **GULF of FINLAND**, on three large sheets, showing the whole navigation between Dager Ort and St. Petersburg. With plans of Cronstadt, Port Baltic or Rager Wik, Revel and Hango Harbours. Illustrated with numerous views of the coast, and accompanied by a Book of Directions ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 14s. 3d.
- \* These are all new charts, engraved in the best and clearest style. They show the navigation from the North Sea to the Gulf of Bothnia or Gulf of Finland on the largest scale yet published.
46. **COAST of NORWAY and WHITE SEA**, on a very large scale. This chart is drawn from the late Norwegian and Russian Surveys; and shows the whole navigation from the British Isles to Arkhangel. It contains plans of the vicinity of Hammerfest and Tromsø, the port of Drontbeim, and the bay of Arkhangel, and is illustrated with several views of the coast. On two sheets. Accompanied with a Book of Directions ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 13s. 0d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 22s. 6d.
47. **WHITE SEA**, on two large sheets. With plans of Arkhangel, Sosnovets, Veshnyak, Nokuev, Sem Islands, Iukanskie and Onega Harbours, the gulf of Onega, &c. Illustrated with numerous views of the coast, and improved by many explanatory notes. Accompanied with a Book of Directions ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 13s. 0d.
- Shipmasters going to Arkhangel should take this chart with Nos. 34 or 35 and 46, as these publications will exhibit the whole voyage to the White Sea.

*The Atlantic, and Islands of the Azores,  
 &c.*

48. **NORTH ATLANTIC**, from Greenland to the Equator, on a very large scale; with plans of the harbour of Funchal, Horta and Pin Bays, and Fayal Channel, and Bermuda Islands. Illustrated with some views. This chart contains much valuable information on the winds and currents, and will be found superior to any before published ... .. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 20s. 0d.
- 48a. **NORTH ATLANTIC DIRECTIONS**. A small pamphlet, price 1s., to accompany this chart.

49. **SOUTH ATLANTIC**, on two large sheets, from the Equator to 65° south latitude, on a very large scale; with plans of the islands of St. Helena, Ascension, Trinidad, Martin Vas, Fernando Noronha, Roccas Reef, &c. Illustrated with some views. Much valuable information on the winds, currents, and temperature of the water is embodied in this chart, and no expense has been spared in producing a good publication ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.  
On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 20s. 0d.
- 49a. **SOUTH ATLANTIC DIRECTIONS.** A small pamphlet, price 1s., to accompany this chart.
- NOTE.—This chart, with the chart of the North Atlantic, No. 48, shows the whole navigation to the Cape of Good Hope and Cape Horn, and will be found very serviceable, as the directions of all the currents are delineated.
50. **AZORES, or WESTERN ISLANDS**, one sheet, on a very large scale; with particular plans of Horta and Piu Bays, Fayal Channel, St. Michael Island, Ponta Delgada, Villa Franca Road, St. Lourenzo Bay, Villa da Porto, Praya, Praya in Terceira, Angra Bay, the Formigas and Dollabarat Shoals, &c. &c., illustrated with numerous views. Drawn principally from the recent survey of Captain Vidal, R.N. A beautifully engraved and cheap chart ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
51. **MADEIRA, PORTO SANTO, and the DEZERTAS**, on one sheet, with a plan of the harbour of Funchal, and illustrated with some views. Drawn from the recent survey of Captain Vidal, R.N. ... .. 4s. 6d.  
On cloth for Captains' use ... .. 5s. 9d.
52. **CANARY ISLANDS**, according to the survey of Captain Vidal and Lieutenant Arlett, of the Royal Navy, containing enlarged plans of Santa Cruz, Puerto de la Luz, Arreciffe, Strait of Rio, and Strait of Bocayna, &c. Illustrated with some views ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
53. **CAPE VERDE ISLANDS**, on a very large scale; with plans of Porto Praya, Porto Grande, Mordeiro Bay, and English Road, drawn chiefly from the surveys of Commanders A. T. E. Vidal and W. Mudge, of the Royal Navy ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.

### *Coast of Africa.*

54. **COAST of AFRICA**, from the Strait of Gibraltar to Sierra Leone. With plans of the harbours of Mazaghan, Salé, Mogador, Santa Cruz or Agadir, Portendic, Sierra Leone, River Senegal, River Gambia, River Cazamance, Goree, the Isles de Los, and Coast in the vicinity of Sierra Leone ... .. 12s. 0d.  
On cloth for Captains' use ... .. 15s. 9d.
55. **COAST OF AFRICA**, from Sierra Leone to the Bight of Benin. With plans of the most important harbours, and numerous views of the coast. On three large sheets ... .. 12s. 0d.  
On cloth for Captains' use ... .. 15s. 9d.

## *Coasts of France, Spain, and Portugal.*

56. \* **BRITISH ISLANDS to the COAST of AFRICA**, showing the navigation between Liverpool and Ireland and Megador. With plans of San Martin de la Arena, Castro Urdiales, Setuval, Santander, Burling Isles, Cape Finisterre, Rabat and Salé, Mazagan, Mogader, Cadiz, and the Rivers Gironde, Tagus, and Douro. On four large sheets. With a Book of Sailing Directions 12s. 0d.  
On cloth for Captains' use ... .. 17s. 0d.
- 57.\* **FRANCE, SPAIN, AND PORTUGAL (the West Coasts of)**, extending from the entrance of the Irish Channel to Gibraltar. With plans on a large scale of San Martin de la Arena, Castro Urdiales, Setuval, Santander, and the Burling Isles; the Rivers Gironde, Tagus, Douro, &c. Accompanied with a Book of Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 14s. 3d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
- \* Either of these charts with No. 31, will show the navigation from the Færoo Islands to the Mediterranean.
58. **BAY of BISCAY**, on a very large scale, drawn from the recent surveys made by order of the French Government, with plans of the principal harbours. Accompanied with a Book of Directions ... .. 10s. 0d.  
On cloth for Captains' use ... .. 12s. 6d.
59. **COASTS of SPAIN and PORTUGAL, from Cape Ortegal to the Strait of Gibraltar**; with plans on a large scale of the Rivers Tagus and Douro, the harbours of Ferrol, Coreubion, Vigo, San Lucar, &c. Drawn from the late Spanish and Portuguese surveys, and improved by the introduction of descriptive notes, views of Headlands, &c. Accompanied with a Book of Sailing Directions 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.
- This chart and No. 53 preceding (the Bay of Biscay) show the navigation from the English Channel to the Mediterranean on a large scale.

## *The Mediterranean Sea.*

60. **The MEDITERRANEAN SEA**. Four sheets. On a large scale, with about 30 plans of the harbours, &c., among which are the following:—Malaga, Alicante, Barcelona, Villefranche, Strait of Gibraltar, Cartagena, Genoa, Hyeres Road, Leghorn, Toulon, Cagliari, Algiers, Strait of Bonifacio, Gulf of Naples, Palermo, Strait of Messina, Valetta, Smyrna, River Danube, Alexandria, Cephalonia, Trieste, Patras, &c. Illustrated with numerous views of the coast, and descriptive notes. Drawn from the late surveys made by order of the British, French, Austrian, and Russian Governments, by Commanders Smyth, Copeland, Graves, Monnier, Le Saulnier de Vauhelle, Gautier, Beauteemps-Beaupré, De Hell, A. Bernard, Dortet De Tesson, &c. A beautifully engraved chart, accompanied with a Book of Directions ... .. 14s. 0d.  
On cloth for Captains' use ... .. 19s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished; size 8 ft. 4 in. by 3 ft. 4 in. ... .. 42s. 0d.  
The same chart, without the Book of Directions ... .. 12s. 0d.
- This chart may also be had in two Parts, as follows:—



61. **(Part I.)—Gibraltar to Sicily**, on two sheets. This chart shows the navigation between the coast of Portugal and Sicily, and contains the following plans, besides numerous views of the coast:—Gibraltar, Channel between Corsica and Italy, Villefranche, Barcelona, Mahon in Minorca, Alicante, Malaga, Almeria, Cartagena, Strait of Gibraltar, Valetta, Strait of Messina, Palermo, Gulf of Naples, Strait of Bonifacio, Algiers, Genoa, Hyeres Road, Leghorn, Toulon, and Cagliari. Accompanied with a Book of Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.
62. **(Part II.)—Italy to Alexandria**, on two sheets. This chart comprises the navigation between the Gulf of Venice, Black Sea, and the Levant, and contains plans of the harbours of Alexandria, Cephalonia, Trieste, Gulf of Patras, the Channel between Zante and the Morea, Mouths of the Danube, Odessa, Smyrna, &c.; it is also illustrated with several views. Accompanied with a Book of Directions ... .. 8s. 0d.  
On cloth for Captains' use... .. 10s. 6d.
63. **MEDITERRANEAN SEA (Western Portion of)**, on three large sheets showing the navigation between Gibraltar and Malta on the most extensive scale yet published. With numerous plans of the most important harbours. Accompanied with a Book of Directions ... .. 12s. 0d.  
On cloth for Captains' use ... .. 15s. 9d.
64. **MEDITERRANEAN SEA (Middle Portion of)**, on two large sheets, showing the navigation between Sicily and Malta and the Grecian Archipelago. Compiled from the most recent surveys, with plans of harbours. Accompanied with a Book of Directions ... .. 8s. 0d.  
On cloth for Captains' use ... .. 11s. 0d.
65. **MEDITERRANEAN SEA (Eastern or Levant Portion)**, on two large sheets, showing the navigation between the Grecian Archipelago and the coasts of Egypt and Syria. With plans of the most important harbours. Compiled from the most recent surveys. Accompanied with a Book of Directions ... .. 10s. 0d.  
On cloth for Captains' use ... .. 12s. 6d.
66. **ADRIATIC or GULF of VENICE**, on two large sheets, with numerous plans of harbours and views of the coast. Accompanied by a Book of Sailing Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 13s. 0d.
67. **ISLAND of SICILY**, on a large scale, with plans of the principal harbours, viz:—Messina, Syracuse, Augusta, Bay of Palermo, and Trapani. A new edition revised and corrected. On one sheet ... .. 5s. 0d.  
On cloth for Captains' use .. .. 6s. 3d.
68. **ARCHIPELAGO and IONIAN ISLANDS**, on two sheets, on a very large scale, with plans of Marmorice and Karagatch Harbours, Corfu and Zante Bays, the Gulf of Smyrna and Khios Strait, &c., and illustrated with several views of the coast. Drawn chiefly from the late surveys of Commanders W. H. Smyth, R. Copeland, T. Graves, &c., of the Royal Navy. A beautifully engraved and accurate chart ... .. 10s. 6d.  
On cloth for Captains' use ... .. 13s. 0d.  
On cloth and roller; for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 22s. 6d.
69. **DARDANELLES**, on one sheet. With plans of the Tenedos Channel, Narrows of the Dardanelles and Lampsaki Bay. ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.

70. **SEA of MARMORA**, on one sheet. With numerous plans of harbours.  
     5s. 0d.  
     On cloth for Captain's use ... .. 6s. 3d.
71. **BLACK SEA and SEA of AZOV**, on three sheets. With plans of the Bosphorus, the Strait of Kerteh, Sulina branch of the Danube, Kustenjeh, Odessa, Balaklava, Burghaz, Varna, Soujak, Rizeh, Batoum, Trebizond, St. Donka, Ghelenjik, Gherzeh, Ounieh, Anapa, Samsoun, Kaffa, Anastra, and Singub. Accompanied with a Book of Directions. A beautifully engraved and elegant chart ... .. 12s. 0d.  
     On cloth for Captains' use ... .. 15s. 9d.  
     On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.

\* Shipmasters bound to the Black Sea or Sea of Azov, should provide themselves with the charts No. 63, 64, 65, 69, 70, 71, as they show the navigation on a very large scale.

*Coasts of North America, the West Indies,  
 &c.*

72. **NEWFOUNDLAND and COAST of LABRADOR**, on four sheets. This chart is drawn from the late English and French surveys, and is believed to contain the most recent and reliable information. It is on four large sheets, and the various plans of the harbours of Quirpon, St. Margaret's Bay, Cod Roy, St. Pierre, Trepassy, Croc, St. John's, Harbour Grace, Conception Bay, Sandwich, Chateau, Red Bay, St. Lunaire Bay, &c., cannot fail to add to its utility; there are also many explanatory remarks, useful as hints to those making the land. Accompanied with a Book of Directions ... .. 12s. 0d.  
     On cloth for Captains' use ... .. 17s. 0d.  
     On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 10 in. by 3 ft. 9 in. ... .. 31s. 6d.
73. **BANKS and Part of the Island of NEWFOUNDLAND**, on two sheets. Compiled principally from the recent surveys made by order of the French Government. This chart contains plans of St. John's and St. Pierre Harbours, and shows the Banks in an accurate manner, on a very large scale, and will be found extremely useful to those engaged in the Quebec and Montreal trade ... .. 7s. 6d.  
     On cloth for Captains' use ... .. 10s. 0d.
74. **COAST of LABRADOR, and North Part of the ISLAND of NEWFOUNDLAND**, on two sheets. With plans, on a large scale, of Croc Harbour and the Strait of Belle Isle. This chart extends from lat. 48° 30' to 55° 30' N., and exhibits the Coast of Labrador to that latitude, and will be found very useful to the Labrador fishermen and St. Lawrence traders, as, independent of the plans, it gives the coast on a large scale ... .. 7s. 6d.  
     On cloth for Captains' use ... .. 10s. 0d.
75. **GULF and RIVER ST. LAWRENCE**, on three sheets. This chart shows the Coast of North America between Belle Isle and Cape Cod, and includes therefore, the Island of Newfoundland, the Gulf and River St. Lawrence, and Coast of Nova Scotia. In it are plans of Halifax, Conception Bay, Strait of Belle Isle, St. Pierre, Harbour Grace, Cape Race, Cape Ray, &c. &c. Accompanied by a Book of Directions ... .. 12s. 0d.  
     On cloth for Captains' use ... .. 15s. 9d.  
     On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.

76. **GULF of St. LAWRENCE**, on two sheets, on a large scale, with plans of Gaspé Harbour, Miramichi Bay, Hillsbro' Bay, and the Mingan Islands. Drawn from the recent surveys of Captain Bayfield, R.N. ... 8s. 0d.  
On cloth for Captains' use ... 10s. 6d.
77. **COAST of NORTH AMERICA from Scatari Island to Cape Cod**, (on three sheets,) including Nova Scotia, the Bay of Fundy, &c., with plans of the harbours of Halifax, Fourchu, Yarmouth, Annapolis, Salem, Portland, Portsmouth, St. John's, and of numerous anchorages on various parts of the coast. Illustrated with views of the coast ... 10s. 6d.  
On cloth for Captains' use ... 14s. 2d.
78. **COAST of NORTH AMERICA, from CAPE CANSO to NEW YORK and the RIVER DELAWARE**, on three large sheets, with plans of several harbours. Accompanied with a Book of Directions ... 12s. 0d.  
On cloth for Captains' use ... 15s. 9d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... 31s. 6d.
79. **COAST of NORTH AMERICA, from NEW YORK and the RIVER DELAWARE to the STRAIT of FLORIDA**, on three large sheets, with plans of the most important harbours. Accompanied with a Book of Sailing Directions. ... 12s. 0d.  
On cloth for Captains' use ... 15s. 9d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... 31s. 6d.
- NOTE.**—These Charts (Nos. 78 and 79) show the whole of the Atlantic sea-board of the United States, and are intended to accompany each other. They include the various surveys made by the officers engaged in the survey of the coast of the United States, and have been engraved at considerable expense, and the greatest care has been taken in their construction, that they may not be inferior to any published.
80. **BAHAMA ISLANDS and BANKS**, on two large sheets. Showing the Strait of Florida and adjacent coasts, with plans, on a large scale, of the principal harbours. Drawn from the late surveys of Commanders Owen and Barnett, of the Royal Navy, and the Spanish and United States Coast Surveys ... 8s. 0d.  
On cloth for Captains' use ... 10s. 6d.
81. **WEST INDIES and COAST of COLOMBIA**, with plans, on a large scale, of the harbours of Vera Cruz, Port Royal, Chagres, Aspinwall, and Havana. Compiled from the latest English, French, and Spanish surveys, and improved by the introduction of views of the coast, descriptive notes, &c. &c. ... 10s. 6d.  
On cloth for Captains' use ... 15s. 6d.  
On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 10 in. by 3 ft. 3 in. ... 27s. 0d.
82. **GULF of MEXICO, and Islands of Cuba, Haiti, Jamaica, the Caribbees, &c.**, on four large sheets. Showing the Windward Passages on a large scale. With a Book of Directions ... 18s. 0d.  
On cloth for Captains' use ... 23s. 0d.  
On cloth and rollers for Counting-house, coloured and varnished; size 8 ft. 4 in. by 3 ft. 4 in. ... 42s. 0d.
83. **GULF of MEXICO, and Islands of Cuba, Haiti, and Jamaica**, being three sheets of Chart No. 82, drawn principally from the surveys of Commanders Owen and Barnett. Accompanied with a Book of Directions ... 14s. 0d.  
On cloth for Captains' use ... 17s. 9d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... 32s. 6d.

84. **BAY of HONDURAS.** On a very large scale, with plans of Belize and other harbours. Drawn from the recent surveys of Commanders Owen and Barnett, of the Royal Navy ... .. 7s. 0d.  
On cloth for Captains' use ... .. 9s. 6d.
85. **COAST of COLOMBIA and CARIBBEAN SEA,** on three large sheets, with plans of the harbours of Greytown, Parcelona, Cumana, Porto Cabello; Santa Anna, Sabanillo, La Guayra, Chagres, &c. &c. Drawn from the late surveys made by order of the British and Spanish Governments; accompanied with a Book of Directions ... .. 12s. 0d.  
On cloth for Captains' use ... .. 15s. 9d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.
86. **CARIBBEE ISLANDS.** Being one sheet of the Chart No. 82. An elegantly engraved chart ... .. 6s. 0d.  
On cloth for Captains' use ... .. 7s. 3d.
87. **CUBA.** On a very large scale, with plans of Havana and the principal harbours, drawn from the recent Spanish surveys ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
88. **HAITI or SAN DOMINGO.** Compiled from the most recent surveys ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
89. **VIRGIN ISLANDS, and part of Porto Rico.** This chart is very useful to the traders to St. Thomas, as it shows the islands on a very large scale, and has a large plan of the harbour of St. Thomas ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.

*The Coasts of South America, California,  
&c.*

90. **COAST of GUAYANA, from Trinidad to Cape Cachipour.** Showing the various harbours and rivers of Demerara, Berbice, Cayenne, &c. Drawn from the latest surveys ... .. 6s. 0d.  
On cloth for Captains' use ... .. 7s. 3d.
91. **APPROACHES to the RIVERS AMAZONA, PARA, &c. from Cape CACHIPOUR to MARANHAM,** with plans of the Rivers Para and Amazona. Drawn from the most recent surveys ... .. 6s. 0d.  
On cloth for Captains' use ... .. 7s. 3d.
- 92.\* **COAST of BRAZIL, from Maranham to Rio Janeiro,** on three large sheets. With plans of the most important harbours on the coast, among which are the following:—Maranham, Pernambuco, Approaches to Pernambuco, Bahia, Parahyba do Norte, River Aracati, Rio Grande do Norte, Espiritu Santo, Port Frio, Rio Janeiro, &c., the Rocas Islets, and other dangers. Drawn principally from the recent surveys of M. Mouchez of the French Navy, and from those by Don A. Vital de Oliveira of the Brazilian Navy. Illustrated with many views of the coast. Accompanied with a Book of Directions ... .. 10s. 6d.  
On cloth for Captains' use ... .. 13s. 9d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.

- 93.\* **COAST of BRAZIL, from Cape Frio and Rio Janeiro to the RIVER PLATE**, on two large sheets. In this chart are given plans of the most important harbours, such as Rio Janeiro, Maranhaya, Santos, Canaen, Paranaguá, Rio Grande, Monte Video, Cape Sta. Maria, &c., and there are explanatory notes which add considerably to its value. Drawn from the most recent French and English surveys. Accompanied with a Book of Directions.
- |                            |          |
|----------------------------|----------|
|                            | 8s. 0d.  |
| On cloth for Captains' use | 10s. 6d. |
- \* These two charts (Nos. 92 and 93) comprise the whole of the Brazil Coast, and are laid down upon the plain scale, not the diagonal.
94. **RIVER PLATE**. A large scale chart, in three sheets, showing the navigation from Monte Video and Buenos Ayres up the Rivers Parana and Uruguay as far as Rosario and Paysandu. With plans of Monte Video, Buenos Ayres, Maldonado, &c. Compiled from recent British, French, Spanish, and American surveys
- |                            |          |
|----------------------------|----------|
| ...                        | 10s. 0d. |
| On cloth for Captains' use | 13s. 9d. |
95. **COAST of SOUTH AMERICA, from the River Plate round Cape Horn to Valparaiso**, on three large sheets. With plans, on a large scale, of Valparaiso and San Carlos Bays, the Strait of Magalhaen, &c. &c. Drawn from the surveys of Captains Fitzroy and King, of the Royal Navy. A beautifully engraved and accurate chart
- |  |          |
|--|----------|
| ...  | 12s. 0d. |
| On cloth for Captains' use   | 15s. 9d. |
| On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. | 31s. 6d. |
96. **WEST COAST of SOUTH AMERICA, from VALPARAISO to TRUXILLO**, on two large sheets. With plans, on a large scale, of the harbours of Valparaiso, Papudo, Horcon, Quintero, Coquimbo, Attico, Huasco, Ilay, Ylo, Arica, Pisco, Chinca Islands, and Callao. Drawn chiefly from the surveys made by Captain Fitzroy, R.N. Illustrated with some views of the coast
- |                            |          |
|----------------------------|----------|
| ...                        | 10s. 0d. |
| On cloth for Captains' use | 12s. 6d. |
97. **WEST COAST of SOUTH AMERICA, from TRUXILLO to PANAMA**, on two large sheets. With plans, on a large scale, of Panama Bay and Harbour, Bahia Honda, the River Guayaquil, &c., and illustrated with some views of the coast. Drawn chiefly from the surveys of Captains Fitzroy, Kellett, Sir E. Belcher, and J. Wood, of the Royal Navy
- |                            |          |
|----------------------------|----------|
| ...                        | 10s. 0d. |
| On cloth for Captains' use | 12s. 6d. |
98. **COAST of CENTRAL AMERICA, extending from COIBA ISLAND to SAN BLAS**; one large sheet. With plans, on a large scale, of the harbours of Sihuatanejo, Acapulco, Guatulco, San Carlos, Realejo, Salinas, Culebra, Punta Arenas, Arenitas, San Blas, and illustrated with some views of the coast. Drawn from the Spanish surveys, and much improved from the observations of Captain Beechey and Commander Belcher, of the Royal Navy
- |                            |         |
|----------------------------|---------|
| ...                        | 6s. 0d. |
| On cloth for Captains' use | 7s. 3d. |
99. **COAST of CALIFORNIA**. From SAN BLAS to SAN FRANCISCO BAY, on one and a half large sheets, with plans of the harbours of Mazatlan, Magdalen Bay, Guaymas, Monterey, and San Francisco, &c., and illustrated with some views of the coast. Drawn from the United States Coast survey, the Spanish surveys, the charts of Vancouver, &c. &c., and much improved by recent observations made by English and French Naval officers
- |                            |          |
|----------------------------|----------|
| ...                        | 7s. 0d.  |
| On cloth for Captains' use | 10s. 0d. |
100. **COAST of OREGON**, on one large sheet. Showing the River Columbia and Vancouver Island, with plans, on a large scale, of Columbia River, St. Juan de Fuca Strait, Port Victoria, Nootka Sound, Port San Juan, Becher and Pedder Bays, and Esquimalt Harbour. Drawn from the surveys of Captains Cook, Vancouver, Kellett, and Belcher, of the Royal Navy, and of Commander Wilkes, of the United States Navy. Illustrated with some views
- |                            |         |
|----------------------------|---------|
| ...                        | 6s. 0d. |
| On cloth for Captains' use | 7s. 3d. |

*The Indian Ocean, &c.*

101. **INDIAN OCEAN**, on two sheets. Upon a large scale, showing the navigation from the Cape of Good Hope to Bombay, Madras, Calcutta, and St. George's Sound, in Australia, or between latitudes 27° N. and 50° S., longitudes 15° E. and 124° E. Drawn from the most recent surveys made by order of the Lords Commissioners of the Admiralty, the Dutch and French Governments, &c. &c. Improved by many remarks on the tidal phenomena, currents, winds, &c. &c. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 4 in. by 3 ft. 5 in. ... .. 20s. 0d.
102. **INDIAN OCEAN**, on three large sheets. The same chart as No. 101, but with an additional sheet containing plans of the principal islands, the Maldivh, Chagos, Seychelles groups, &c. ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 14s. 3d.  
 On cloth and rollers for Counting-house, coloured and varnished ... .. 30s. 0d.
103. **INDIAN and PACIFIC OCEANS**, on three large sheets. Being the same chart as No. 101, with the addition of an extra sheet, to show the coasts of Australia, New Zealand, China, and the Filipinas Islands. The limits of the chart are latitudes 27° N. and 50° S., and longitudes 15° E. and 178° E. 12s. 0d.  
 On cloth for Captains' use ... .. 15s. 9d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 30s. 0d.
104. **INDIAN AND PACIFIC OCEANS**, on four sheets. Showing the navigation eastward of the Cape of Good Hope to Australia and China, or between latitudes 27° N. and 50° S., and longitudes 15° E. and 178° E. With a sheet of plans of detached groups of islands so profusely scattered over the Indian Ocean ... .. 16s. 0d.  
 On cloth for Captains' use ... .. 21s. 0d.
105. **INDIAN and PACIFIC OCEANS**, on four large sheets. Being the same chart as No. 103, but with an additional sheet to show the navigation south as far as lat. 62°. In this chart the Great Circle Tracks are laid down between False Bay (Cape of Good Hope), and St. George's Sound, Australia; and also between False Bay and Port Philip. The courses to India in the various seasons of the year are also shown ... .. 14s. 0d.  
 On cloth for Captains' use ... .. 19s. 0d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 4 in. by 4 ft. 2 in. ... .. 35s. 0d.
106. **PLANS of ISLANDS, &c., in the INDIAN OCEAN**, on one sheet. Being the additional sheet referred to in No. 102. The plans are Maldivh, Chagos, Seychelles, and Lakdivh groups of Islands: Comoro Islands; Kerguelen Land; St. Paul Island; Cocos Islands; Mahé in Seychelles; and Christmas Harbour in Kerguelen Land. All these are on a very large scale ... .. 5s. 0d.  
 On cloth for Captains' use ... .. 6s. 3d.
107. **SOUTHERN AFRICA and MADAGASCAR**, on three large sheets. Showing the Cape of Good Hope and Mozambique Passage on a very large scale, and exhibiting the navigation between Table and False Bays, and the islands of Mauritius and Reunion ... .. 12s. 0d.  
 On cloth for Captains' use ... .. 15s. 9d.
108. **COAST of the CAPE COLONY, from Table Bay to Algoa Bay**, on two large sheets, with plans of Harbours. Compiled from the latest surveys. Illustrated with views of the coast ... .. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.

109. **COAST OF THE CAPE COLONY, from Table Bay to Port Natal.**  
 On three sheets, with plans of harbours ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 14s. 3d.
110. **MAURITIUS**, one sheet, on a very large scale, with plans of Port Louis and Grand Port. Drawn from recently published documents ... 5s. 0d.  
 On cloth for Captains' use ... .. 6s. 3d.
111. **GULF of ADEN**, one sheet, from Socotra Island to the Red Sea, with a plan of Aden. Illustrated with views of the land. On a large sheet. Drawn from recent surveys ... .. 6s. 0d.  
 On cloth for Captains' use ... .. 7s. 3d.
112. **INDIA (West Coast of), from Cape Comorin to Bombay**, on two large sheets, with plans of the harbours of Bombay, Cochin, and Calicut, also of the approaches to Bombay. Improved by the introduction of remarks upon currents, winds, &c. ... .. 10s. 6d.  
 On cloth for Captains' use ... .. 13s. 0d.
113. **INDIA (West Coast of), from Bombay to Karachi**, on two large sheets, with plans of the harbours of Bombay and Karachi ... 10s. 6d.  
 On cloth for Captains' use ... .. 13s. 0d.
114. **BAY of BENGAL**, on two sheets, on a very large scale, with plans of Akyab, Bassein, Trincomalie, Colombo, Point de Galle, Bassas Reefs, &c. &c. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.
115. **BAY of BENGAL (No. 1, West part of the)**, on two large sheets, comprising the coast from Cape Comorin to Cocanada, and including Ceylon. With plans of Bassas Reefs, Colombo, Point de Galle, Trincomalie, Cocanada, Paumben Pass, &c. &c. (Limits of chart, latitudes  $11^{\circ} 5'$  to  $17^{\circ} 30' N.$ , and longitudes  $76^{\circ} 30'$  to  $86^{\circ} 45' E.$  ... .. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.
116. **BAY of BENGAL (No. 2, North part of the)**, on two large sheets, comprising the coast between Pulicat and Bassein River. With plans of Akyab, Bassein River, Kyou Phiouk, &c. &c. Limits of charts, latitudes  $13^{\circ} 10'$  to  $23^{\circ} N.$ , and longitudes  $82^{\circ}$  to  $95^{\circ} E.$  ... .. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.
117. **BAY of BENGAL (No. 3, East part of the)**, on two large sheets, comprising the coast between Bassein River and Penang, and showing the Andamans, Nicobars, and north coast of Sumatra. With plans of the principal harbours. (Limits of chart, latitudes  $11^{\circ} 5'$  to  $17^{\circ} 30' N.$ , and longitudes  $91^{\circ}$  to  $101^{\circ} 20' E.$  8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.
- \* These three charts (Nos. 115, 116, 117), include the whole of the Bay of Bengal, and are on a larger scale than any yet published. They form an invaluable series of charts for the use of Traders in the Bay.
118. **RICE PORTS of INDIA.** A chart, on two large sheets, of the east coast of the Bay of Bengal, between latitudes  $13^{\circ}$  and  $21^{\circ} N.$ , and longitudes  $92^{\circ}$  and  $98^{\circ} E.$  With plans of Akyab, Kyou Phiouk, Bassein River, Rangoon River, Maulmain, and Kalegouk Island anchorage. A very useful chart for Shipmasters bound to Akyab, Rangoon, or Maulmain, as it exhibits the navigation on a larger scale than any hitherto published ... .. 8s. 0d.  
 On cloth for Captains' use ... .. 10s. 6d.
- (All these charts of the Bay of Bengal (Nos. 114, 115, 116, 117, and 118) are new publications. The publishers feel confident that better or more useful charts cannot be obtained, as recourse has been made to every available official survey, and no expense has been spared in their production).
- 118a. **SAILING DIRECTIONS FOR THE BAY OF BENGAL**, to accompany the charts of the Bay, particularly describing the Rice Ports. With plans of many of the most important harbours ... .. 6s. 0d.

*East India Archipelago, China, &c.*

119. **CHINA SEA and EAST INDIA ARCHIPELAGO**, on two sheets. Being a general chart of all the islands composing the Archipelago of the India and China Seas ... .. 8s. 0d.  
On cloth for Captains' use ... .. 10s. 6d.
- 120.\* **EAST INDIA ARCHIPELAGO. (Western Route to China, Chart No. 1.)** Limits, latitudes 2° 50' and 7° 10' S., and longitudes 105° 30' and 110° 50' E. ... .. 7s. 6d.
- 121.\* **EAST INDIA ARCHIPELAGO. (Western Route to China, Chart No. 2.)** Its limits are, latitudes 3° 0' S., and 5° 40' N.; and longitudes 103° 20', and 110° 20' E. ... .. 7s. 6d.
- 122.\* **EAST INDIA ARCHIPELAGO. (Western Route to China, Chart No. 3.)** Limits, latitudes 3° N. to 10° 20' N., and longitudes 99° 20' to 110° E. ... .. 7s. 6d.
- 123.\* **EAST INDIA ARCHIPELAGO. (Western Route to China, Chart No. 4.)** Limits, latitudes 1° 20' to 11° 52' N., and longitudes 107° 20' to 120° 40' E. ... .. 7s. 6d.
- 124.\* **EAST INDIA ARCHIPELAGO. (Western Route to China, Chart No. 5.)** Limits, latitudes 10° 50' and 23° 40' N., and longitudes 104° 45' and 115° 20' E. ... .. 7s. 6d.
- 125.\* **EAST INDIA ARCHIPELAGO. (Western Route to China, Chart No. 6.)** Limits, latitudes 10° 50' and 23° 40' N., and longitudes 112° 10' and 122° 45' E. ... .. 7s. 6d.
- \* These charts (Nos. 120 to 125) of what is popularly known as the Western Route to China, exhibit the navigation from Sunda Strait to the Coast of China on a very large scale. Each consists of two sheets; the set, therefore, comprises twelve sheets. They have been compiled from the most recent British, French, Dutch, and Spanish surveys. In several of the charts there are notes descriptive of the currents, winds, &c., and remarks upon the courses most advisable to follow at certain periods of the year. If mounted on cloth for Captains' use, the price of each will be 2s. 0d. extra. An Index Chart accompanies the set.
126. **STRAITS OF MALACCA and SINGAPORE**, on two large sheets, with plans of Singapore Strait, Singapore Harbour, Penang Island, Strait of Durian, &c. Drawn from the most recent surveys ... .. 10s. 6d.  
On cloth for Captains' use ... .. 13s. 0d.
127. **STRAIT of SUNDA**, on two sheets, on the largest scale yet published. With plans of Harbours... .. 7s. 0d.  
On cloth for Captains' use ... .. 9s. 6d.
128. **STRAIT of SUNDA**, one sheet. The same chart as the preceding, but without the sheet containing Batavia Road ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
129. **GASPAR STRAIT**, one sheet, on the largest scale yet published. ... .. 5s. 0d.  
On cloth for Captains' use ... .. 6s. 3d.
- 130.\* **EAST INDIA ARCHIPELAGO (Eastern Passages to China and Japan,—Chart No. 1.)** This chart with No. 120 (the Western Route to China, Chart No. 1) will exhibit the navigation of the Indian Archipelago eastward of Sunda Strait, so far as Macassar Strait. Its limits are latitudes 2° 30' and 12° 20' S., and longitudes 110° 10' and 122° 20' E. ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 131.\* **EAST INDIA ARCHIPELAGO (Eastern Passages to China and Japan,—Chart No. 2)**, showing the Banda Sea and great island of Timor, Pitts Passage, &c. Limits, latitudes 2° 30' and 12° 20' S., and longitudes 121° 30' and 133° 40' E. ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.



- 132.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 3), showing the Arafura Sea, Torres Strait, &c. Limits, latitudes  $2^{\circ} 30'$  and  $12^{\circ} 20' S.$ , and longitudes  $133^{\circ}$  and  $145^{\circ} 15' E.$  7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 133.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 4.) This chart shows the sea northward of Chart No. 1, and includes Macassar Strait, Celebes Sea, &c. Limits, latitudes  $3^{\circ} 20' S.$  and  $8^{\circ} 40' N.$ , and longitudes  $116^{\circ} 10'$  and  $125^{\circ} 50' E.$  ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 134.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 5), showing the Molucca Islands and south part of the Filipinas. Limits, latitudes  $3^{\circ} 20' S.$  and  $8^{\circ} 40' N.$ , and longitudes  $125^{\circ}$  and  $134^{\circ} 40' E.$  ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 135.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 6), showing the greater part of the Filipinas, the Sulu Sea, &c. Limits, latitudes  $8^{\circ}$  and  $17^{\circ} 40' N.$ , and longitudes  $118^{\circ} 20'$  and  $130^{\circ} 20' E.$  ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 136.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 7), showing Formosa, the Majico-sima Islands, &c., also the northern part of the Filipinas. Limits, latitudes  $16^{\circ} 30'$  and  $25^{\circ} 40' N.$ , and longitudes  $118^{\circ} 20'$  and  $130^{\circ} 20' E.$  ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 137.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 8), showing the coast of China from Formosa Island to the Gulf of Pe-chi-li and the western islands of Japan. Illustrated with numerous views of the coast. Limits, latitudes  $25^{\circ}$  and  $41^{\circ} N.$ , longitudes  $117^{\circ} 30'$  and  $132^{\circ} 40' E.$  ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.
- 138.\* **EAST INDIA ARCHIPELAGO** (Eastern Passages to China and Japan,—Chart No. 9), showing the islands of Japan. With numerous plans of harbours. Limits, latitudes  $32^{\circ}$  and  $43^{\circ} 54' N.$ , longitudes  $127^{\circ}$  and  $140^{\circ} E.$  ... .. 7s. 6d.  
On cloth for Captains' use ... .. 10s. 0d.

\* These charts of the eastern portion of the East India Archipelago and the Eastern and Yellow Seas, show the various islands and passages on the largest scale yet published. Each consists of two large sheets (double elephant size), so that the whole series is composed of eighteen sheets. They have been compiled from the most recent English, Dutch, French, and Spanish surveys, and no expense has been spared to make them the most complete and accurate charts of these seas in existence. Shipmasters proceeding to Eastern Australia from China and Japan should take, in addition to these charts, those of the Western Pacific Ocean, numbered 142, 143, and 144. An Explanatory Index Chart accompanies each set of charts.

139. **COAST OF CHINA**, from the Canton River to Shanghai, and Adjacent Islands, on two large sheets, containing plans of the Pratas Reef, the Harbours of Hong-Kong, Amoy, Shanghai, Tong-sung, Hoo-e-tow, the Rivers Yangtsi and Woosung, and of the Chusan Archipelago, &c. Drawn chiefly from the surveys of Commanders Kellet and Collinson, of the Royal Navy 10s. 6d.  
On cloth for Captains' use ... .. 13s. 0d.

### The Pacific Ocean, Australia, &c.

- 140.\* **NORTH PACIFIC OCEAN**, on three large sheets. Extending from the Equator to  $69^{\circ} N.$  Latitude, and from  $60^{\circ} W.$  Longitude to  $110^{\circ} E.$  Longitude. The plans of islands and harbours are about forty in number 12s. 0d.  
On cloth for Captains' use ... .. 15s. 9d.  
On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.

- 141.\* **SOUTH PACIFIC OCEAN**, on three large sheets. With about forty plans of islands and harbours ... .. 12s. 0d.  
 On cloth for Captains' use ... .. 15s. 9d  
 On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.

\* These are new publications, and show the great Pacific Ocean on a large scale.

- 142.\* **PACIFIC OCEAN (Western Part, No. 1)**, on two large sheets. Showing the navigation northward from Sydney (Eastern Australia) to Torres Strait, and through the New Hebrides, &c. Limits; Latitudes 0° to 38° S., and Longitudes 140° to 172° 40' E. ... .. 7s. 6d.  
 On cloth for Captains' use ... .. 10s. 0d.

- 143.\* **PACIFIC OCEAN (Western Part, No. 2)**, on two large sheets. Limits; Latitudes 3° S. to 35° 30' N., and Longitudes 150° E. to 177° 20' W. In this chart there are about forty plans of the principal islands and harbours met with in the route from Australia to China and Japan. ... .. 7s. 6d.  
 On cloth for Captains' use ... .. 10s. 0d.

- 144.\* **PACIFIC OCEAN (Western Part, No. 3)**, on two large sheets. Limits; Latitudes 3° S. to 35° 30' N., and Longitudes 120° to 152° 40' E. ... .. 7s. 6d.  
 On cloth for Captains' use ... .. 10s. 0d.

\* These three charts (Nos. 142, 143, 144) show the navigation between Eastern Australia and Japan, on the largest scale yet published. The numerous plans of harbours and islands (49 in number) greatly increase their usefulness. An Index Chart accompanies the set.

145. **AUSTRALIA, TASMANIA, NEW ZEALAND, &c.** A general Chart, on four large sheets, showing the navigation between the various ports of Australia, New Zealand, New Caledonia, and the approaches to Torres Strait, with plans of Bass Strait and Port Phillip. Illustrated with some views of the coast ... .. 12s. 0d.  
 On cloth for Captains' use ... .. 17s. 0d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 4 ft. 10 in. by 3 ft. 9 in. ... .. 30s. 0d.

146. **AUSTRALIA, South, East, and West Coasts of**, on three large sheets, with plans of Ports Fairey, Stephens, Dabrymple, Botany Bay, Cockburn Sound, King George's Sound, Storm Bay, Port Adelaide, Jervis Bay, Portland Bay, Ports Phillip, Jackson, Newcastle, and Moreton Bay. Drawn from the most recent surveys. Illustrated with some views of the coast ... .. 12s. 0d.  
 On cloth for Captains' use ... .. 15s. 9d.  
 On cloth and rollers for Counting-house, coloured and varnished; size 6 ft. 5 in. by 3 ft. 5 in. ... .. 31s. 6d.

147. **MARITIME FLAGS OF ALL NATIONS**, on a large sheet, richly coloured, 7s. 6d.; if mounted on cloth and rollers, coloured and varnished, 15s. In book, 15s.

148. **The HEAVENS**. A chart delineating the stars from the 1st to the 4th magnitude, inclusive, constructed principally from the Catalogue of the Royal Astronomical Society ... .. 5s. 0d.  
 On cloth for Captains' use ... .. 6s. 3d.

## *Pilots.*

149. **NORTH SEA and COASTING PILOT.** Containing the following Charts upon a much larger scale than the former ones:—No. 1, the River Thames, with all its entrances, on a large scale.—No. 2, The East Coast of England, from Orfordness to Flamborough Head, with plans of Yarmouth Roads and River Humber, on a large scale.—No. 3, The East Coasts of England and Scotland, from Flamborough Head to the Orkneys; with plans on a large scale of the Farn Islands, River Tees, Berwick and Sunderland Ports, entrance to the River Tyne, and Hartlepool Bay.—No. 4, A General Chart of the North Sea, extending from the Islands of Jersey, Guernsey, &c., to Bergen in Norway, the Shetland Islands, &c. ... .. 12s. 0d.
150. **ENGLAND and SCOTLAND PILOT.** Containing the following Charts, viz.:—No. 1, The River Thames, with all its entrances, on a large scale.—No. 2, The East Coast of England, from Orfordness to Flamborough Head.—No. 3, The East Coasts of England and Scotland, extending from Flamborough Head to the Orkneys; with plans on a large scale of the Farn Islands, River Tees, Berwick and Sunderland Ports, entrance to the River Tyne, and Hartlepool Bay ... .. 10s. 0d.
151. **COAL TRADE PILOT.** Containing the following Charts, viz.:—No. 1, The River Thames on a large scale.—No. 2, The East Coast of England, from Orfordness to Flamborough Head, with plans of Yarmouth Roads and the River Humber.—No. 3, Chart of the Coal Ports, extending from Flamborough Head to Coquet Island, containing plans of Sunderland and Hartlepool Harbours, the Rivers Tees and Tyne, Scarborough, Whitby, Blythe, and Coquet Road; and illustrated with views of the principal lighthouses ... .. 9s. 0d.

## *Books on Navigation, &c.*

- NAVIGATION and NAUTICAL ASTRONOMY.** A plain and popular Treatise, containing all the Sailings; Plane and Spherical Trigonometry; various methods of ascertaining the Latitude by Meridian, Single and Double Altitudes; the Longitude by Chronometer and Lunar Observations; and the variation of the Compass by Amplitudes and Azimuths; and also a Journal of a Voyage from London to Madeira. The whole being illustrated by practical Rules, and a sufficient number of appropriate Examples, for rendering the student proficient in the necessary computations of Navigation and Nautical Astronomy. Accompanied by a set of requisite Tables, with their explanation and use in resolving the various Astronomical and other Problems given in the course of the Work. With an Appendix containing the Principles of Great Circle Sailing, and twenty additional methods of finding the Latitude and Longitude. By James Griffin, but revised and considerably improved and enlarged by Wm. Turnbull. 10s. 0d.  
With KEY to the Exercises, in which every Question is worked ... 12s. 0d.
- ROSSEY'S NAVIGATION, and Guide to the Marine Board Examination.** A complete Epitome of Navigation, with the requisite Tables. (See page 24.) ... .. 10s. 6d.
- NORIE'S EPITOME of NAVIGATION.** Containing all necessary instructions for keeping a ship's reckoning at Sea; with the most approved methods of ascertaining the Latitude and Longitude. By J. W. Norie ... .. 16s. 0d.

**RAPER'S NAVIGATION** The Practice of Navigation and Nautical Astronomy.  
By Lieut. Raper, R.N. ... .. 16s. 0d.

**THOM'S NAVIGATION.** (An American work.) ... .. 21s. 0d.

**BOWDITCH'S EPITOME of NAVIGATION.** Containing all the Tables necessary to be used with the Nautical Almanac in determining the Latitude and Longitude, and keeping a complete Reckoning at Sea; illustrated by proper rules and examples. By Nathaniel Bowditch, LL.D. (An American work.)  
25s. 0d.

**GALLO'S TREATISE on NAVIGATION.** In the Italian language. Containing all the rules for determining the Latitude and Longitude at Sea, with the Theory and Practice of Navigation. By Vincenza Gallo, Doctor of Mathematics and Nautical Professor in the Collego at Trieste, and Honorary Member of the various continental learned Societies. In 2 thick volumes. ... 22s. 0d.

**DAILY ASSISTANT,** and Mariner's General Guide to Navigation and Nautical Astronomy, for short voyages; with all the requisite Tables. By W. H. Rosser  
5s. 0d.

This edition of the Mariner's Daily Assistant comprises all the Rules and Tables necessary to enable the seaman to determine his position at sea when no chronometer is on board, as is generally the case with Coasters and vessels employed on short voyages.

The Rules are given in as simple a form as possible, and the Tables (including the Sun's Declination, from the Nautical Almanac) have been carefully revised and collated.

**CHRONOMETER'S COMPANION.** Comprising the various methods of finding a Ship's position at Sea; Latitude by a Meridian Altitude; Time by the Sun and Stars; Longitude by Chronometer; the Error of the Chronometer by Equal Altitudes; and Latitude and Longitude from two Altitudes of a Heavenly Body. With all the requisite Tables and a Chart. By W. H. Rosser ... 6s. 0d.

This work comprises the principal rules of Nautical Astronomy required to determine a Ship's position at Sea, with the exception of the Lunar Observations. The Rules and Tables do not occupy much space, and on that account ready reference can be made to them. Several examples (worked in full) accompany each rule.

The method of finding the Latitude and Longitude by two Altitudes (commonly called Sumner's method) is of very great utility, and if practised will be of service to the Navigator when making the land, and generally at sea when the Latitude is uncertain.

**CHRONOMETER'S COMPANION, or PERPETUAL SOLAR ALMANAC.** Containing the Sun's Declination, Right Ascension, and Equation of time to 1969; with easy methods of finding the Latitude by the Meridian Altitude of the Sun, Moon, and Stars, and likewise by the Pole Star at any time. By James Griffin. Bound, cloth ... .. 2s. 0d.

**LUNAR and TIME TABLES.** Adapted to new, short, and accurate methods, for finding the longitude by Chronometers and Lunar Distances; including methods of applying corrections to a Lunar Distance for the spheroidal figure of the Earth, the apparent elliptical forms of the Sun and Moon, and for the temperature and density of the atmosphere. With an Appendix, containing four additional new Lunar Methods, demonstrations of the rules and mathematical formulæ for constructing the Tables. To which are added Maps of the Stars, and Rules for finding the principal heavenly bodies. By James Gordon, A.M. Approved by the Astronomer Royal and others. Bound in cloth ... 8s. 0d.

\*\* This work has been honoured with the approbation of the Board of Trade, the Trinity-house Corporation, Lloyd's, and the Honourable East India Company. The Court of Directors of the Honourable East India Company were pleased to present the Author with the sum of £50, and at the same time ordered fifty copies for the use of the Indian Navy. The Lords Commissioners of the Admiralty also granted a similar reward of £50.

**THOMSON'S LUNAR TABLES.** Containing new and concise methods of performing the calculations necessary for ascertaining the Longitude by Lunar Observations or Chronometers; with directions for acquiring a knowledge of the principal fixed Stars, and finding the Latitude by them. By David Thomson. 10s. 0d.

**THE STARS. How to Know Them and How to Use Them.** With copious Astronomical Definitions, and numerous Problems and Tables. Illustrated with Diagrams, and four large Maps of the Stars. By W. H. Rosser ... 7s. 6d.  
At sea the Navigator frequently sees the Stars during the night when the Sun has been obscured by day; but very few (comparatively) make a practice of taking stellar observations, owing to not understanding Sidereal Time. This Work is a Complete Guide at once to the knowledge of the Stars and Constellations, and to finding Latitude, Time, and Longitude from them.

**CAPTAIN SUMNER'S METHOD of FINDING A SHIP'S POSITION at SEA,** improved and simplified. Containing the solution of the double altitude problem by projection; and a new method of finding the Time at Sea, which is conceived to be the shortest and easiest of any yet published. By James Gordon, A.M. Bound in cloth ... 7s. 6d.

**METHODS of FINDING a SHIP'S POSITION AT SEA** by calculation, or by projection on a chart. By W. H. Rosser ... 1s. 6d.

**LATITUDE and TIME.** A work containing new and concise methods of finding the Latitude by the reduction to the Meridian; the Latitude and Time by Double and equal Altitudes; also the Time when the Sun's lower limb is on the horizon. By R. C. Forbes ... 2s. 0d.

**REDUCTION OF EX-MERIDIAN ALTITUDES.** By J. F. Towson, F.R.G.S. ... 1s. 0d.

**LATITUDE BY THE ALTITUDES OF TWO STARS,** and also their true bearings or azimuths at that time. By John Burdwood, Staff-Commander, R.N. 1s. 0d.

**GREAT CIRCLE SAILING.** A Treatise on the theory and practice of Great Circle Sailing, comprising the several cases which require the application of Spherical Trigonometry; with practical Rules and Examples: to which is added an Abstract of the formulæ and rules, with outline charts. By W. Turnbull. 3s. 6d.

**TRIGONOMETRICAL SURVEYING,** containing full and detailed solutions of all the most important cases of Triangulation that usually occur in the surveying a Country or a Sea Coast; the principles herein discussed being of the utmost utility in determining the position of remote and prominent objects, whether on land or at sea. The whole illustrated by numerous Diagrams, showing the method of constructing and calculating the several cases and varieties treated of in the work. By W. Turnbull ... 5s. 0d.

**SPHERICAL TRIGONOMETRY.** Comprising the Stereographic Projection of the Circles of the Sphere; together with the construction and calculation of all the cases of Right and Oblique Angled Spherical Triangles, the calculations being performed by means of Tabular Formulæ of easy reference and application, deduced from the development of a Spherical Truncated figure on a plane. The whole being illustrated by numerous Diagrams, and particularly adapted to the use of Geographers, Navigators, and Astronomers. By W. Turnbull. 5s. 0d.

With KEY to the EXERCISES, comprising Solutions in full, of all the Examples proposed for the learner's Exercises, under the several cases and varieties into which the subject is divided; with the appropriate formulæ for computing the three varieties of each example, selected in their order, from the Tables given in the work: ... 7s. 6d.

**SPHERICAL ASTRONOMY.** Comprising the Stereographic Projection of the Sphere, on the Planes of the Six Great Circles usually drawn on common Globes, including the meridian, horizon, equator, ecliptic, and the equinoctial and solstitial colures; with Tables of formulæ and numerous problems and Rules for determining the declinations, right ascensions, latitudes, longitudes, amplitudes, azimuths, and mutual distances, of the heavenly bodies; the times of their rising, setting, and culminating on the meridian, with various other particulars necessary to be known by those who would become proficient in the theory of Navigation and Geography. The whole illustrated by appropriate diagrams and practical examples, for exercising the Student in the application of the various rules which are given in the course of the work. By W. Turnbull ... 5s. 0d.

With **KEY** to the **EXERCISES**, comprising full Solutions of all the Examples proposed for Exercises under each problem; to which are added formulæ for computing the parallaxes of the heavenly bodies, in altitude, latitude, and longitude. 7s. 6d.

**AZIMUTH TABLES**, showing the true bearing of the Sun, or other celestial object, that is comprehended between the twenty-fourth parallel of north and south Declination, for every degree of Altitude, between the parallels of 60° on each side of the Equator. By Thomas Lynn. (Very scarce.) ... £2 2s. 0d.

**HORARY TABLES**, for finding the time by inspection, to facilitate the operations for obtaining the longitude at sea by chronometers and lunar observations; also for finding the latitude and time, &c. By Thomas Lynn. (Very scarce.) £3 3s. 0d.

### *Guide Books for the Marine Board Examination.*

**HAND-BOOK** to the **ORDINARY** and **EXTRA EXAMINATIONS**: being a Self-Instructor in Navigation and Nautical Astronomy for the Local Marine Board Examinations, as well as for Sea Use; containing also an Appendix, giving the Lights of the Channel, the Rule of the Road, the Stowage of Cargoes, &c., and various other subjects of a similar character. By W. H. Rosser, Editor of the "Mercantile Marine Magazine," Author of "Notes on the Physical Geography of the Atlantic," &c. ... .. 7s. 6d.

**MATHEMATICAL and NAUTICAL TABLES** to accompany the Hand-book to the Ordinary and Extra Examinations. By W. H. Rosser ... 4s. 0d.  
The two works bound together, make a complete **Epitome of Navigation**. 10s. 6d.

**EXAMINATION GUIDE** for the **MARINE BOARDS**, containing the Rules for, and Examples in, the various problems proposed to Candidates for a Certificate of Competency as Second Mate, Only Mate, First Mate, and Ordinary Master. By James Gordon, A.M. ... .. 2s. 6d.

**EXTRA EXAMINER** for the **NATIONAL MARINE BOARDS**, containing all that is necessary for an extra Master to pass his Examination before any of the Marine Boards. Including Articles on Charterparties, Bills of Lading, Bottomry Bonds, Lloyds' Agents, Protests and Surveys, Deviation of the Compass, Great Circle Sailing, and Law of Storms. With an Appendix containing Arithmetical Tables, Elements from the Nautical Almanac for 1851, List of Lights in the English Channel, Description of the Lights of Steamers, and Rules for Stowing Cargoes. By James Gordon, A.M. Bound in cloth. 6s. 0d.

**NAUTICAL EXAMINER; or, CATECHISM of NAVIGATION.** Comprising Questions and Answers on subjects necessary to be known by the youthful Student when commencing a course of nautical instruction. By W. Turnbull ... .. 1s. 6d.

- CATECHISM OF NAVIGATION.** Being a series of comprehensive Questions and Answers, enabling the Student to examine himself before applying for his Certificate to the Board of Examination lately established by order of the Board of Trade; to which are added some Rules for finding the Stars, remarks upon the Barometer, &c. (Second Edition.) By James Griffin. Bound, cloth ... .. 2s. 0d.
- EXAMINATION GUIDE**; containing full instructions for passing the Marine Board Examination, with numerous questions for exercise. By Thomas L. Ainsley ... .. 6s. 0d.
- EXAMINER IN SEAMANSHIP.** By Thomas L. Ainsley ... 1s. 6d.
- ENGINEER'S MANUAL,** for the Marine Board Examination. Illustrated with numerous diagrams. By Thomas L. Ainsley ... .. 6s. 0d.
- ENGINEER'S EXAMINATION GUIDE.** By W. H. Thorn ... 3s. 6d.
- GUIDE BOOK for the MARINE BOARD EXAMINATION and COASTER'S ASSISTANT.** With a List of Lights, and the Bearings and Distances of various Ports and Headlands. By Thomas Reed ... 2s. 6d.
- KEY to ditto ... .. 2s. 6d.
- EXAMINER IN SEAMANSHIP.** By Thomas Reed ... .. 1s. 0d.
- SEAMANSHIP and RIGGING.** By James B. Moffatt, Boatswain in the Royal Navy ... .. 1s. 6d.
- SEAMANSHIP and NAVAL DUTIES.** By Lieut. A. H. Alston, R.N. With 200 Illustrations ... .. 10s. 6d.
- SEAMANSHIP.** With 320 Illustrations of Knots, Splices, Masts, Sails, and Rigging. By Lieutenant George S. Nares, R.N. ... .. £1 1s.

Its principal contents are:—Names of the principal parts of a Ship—Fittings—Names of Masts, Sails, and Yards—Parts of a Mast, Bowsprit, Yard, and Sail—The Standing Rigging—Bends and Hitches—Lead and Log Line—Use of the Running Rigging—Knots and Splices—Seizings and Lashings—Rope Making—Fittings of and Placing the Standing Rigging—Rigging of the Masts, Yards, and the Bowsprit—Fittings of Blocks and Tackles—Setting up and Questions on Rigging—Reeving the Running Rigging—Tanks, Ballast, Provisions—Berthing—Rule of the Road and Vessel's Lights—Sea Terms—Getting Tops, &c. over Mast Head—Rules for Managing Sails—Making-up, Bending, Reefing, and Furling Sails—Crossing Top-Gallant Yards—Working Studding Sails—Boat Sailing—Fittings and Stowage of Anchors and Cables—Working Anchors and Cables—Shifting Sails and Spars—Mechanical Powers—Manœuvring—Why a Ship moves forward under Sail—Why a Ship carries Weather Helm—Effect of a Rudder in Tacking—To Tack a Ship, &c.—To Unmoor and proceed to Sea—Trimming and making Sail—Down Top-Gallant Yards and Masts—Furl Mainsail and Fore Topsail—Making Sail—A Heavy Squall to Windward—Ropes and Spars carried away—Man Overboard—Life Buoys—Table showing the Steady and Working Strain to which a Cable, Chain, or Rope may be put—Table showing whether a Vessel gains or loses by keeping away—Instructions on the Management of Boats in a Surf, &c.—To Communicate between a Wreck and a Lee Shore—Cunningham's Method of Reefing Topsails.

*Legal Works.*

**LAWS of SHIPPING and INSURANCE:** with a copious Appendix, containing the existing Statutes, Custom-house and Pilots' Regulations, forms of Deeds and Writs, &c. &c. By James Lees ... .. 12s. 6d.

**LAWS of the CUSTOMS,** with the Tariff, or Customs Table and Customs Forms; and an Appendix containing the Customs Acts, and the Rules and Orders of the Commissioners of Customs. By James Lees ... .. 6s. 0d.

**MERCHANT SHIPPING ACT of 1854.** A practical digest of the Act, methodically arranged, and with notes illustrating the operation of its various clauses. By James Lees ... .. 3s. 0d.

**LEES' MANUAL.** Consisting of a series of Letters addressed to Master Mariners, upon the different situations they may be placed in during the course of a voyage. 6s. 0d.

**MERCANTILE MARINE ACT.** For improving the condition of Masters, Mates, and Seamen, and maintaining discipline in the Merchant Service, with other information relative thereto ... .. 3s. 0d.

**CONSULS.** The British Merchant's, Shipowner's, and Master Mariner's practical Guide in all their Consular transactions. By E. W. A. Tuson, of the Inner Temple, Chancellor of the Imperial Austrian Consulate-General, in London. 7s. 6d.

**PILOTAGE.** The charges for Pilotage of the various ports of the United Kingdom, with the rules and regulations by which the Pilots are governed ... 6s. 0d.

**THE LAW AND PRACTICE OF THE HIGH COURT OF ADMIRALTY OF ENGLAND,** in Two Volumes. By William Tarn Pritchard. With Notes from Text Writers, and the Scotch, Irish, and American Reports. Second Edition, omitting Prize and Slave Cases. By Robert A Pritchard, D.C.L., of the Inner Temple, Barrister-at-Law, and William Tarn Pritchard. With Notes of Cases from French Maritime Law. By Algernon Jones, Avocat à la Cour Imperiale de Paris ... .. £3 0s.

**THE LAW OF MERCHANT SHIPPING.** By David MacLachlan, M.A., of the Middle Temple, Barrister-at-Law. This work exhibits the Law of Maritime War, Contraband, and Right of Search applicable to merchant ships of enemies and neutrals ... .. £1 16s.

**A HANDBOOK OF AVERAGE,** for the use of Merchants, Agents, Shipowners, Masters, and others; with a chapter on Arbitration, to which are added Appendices containing some of the most important decisions in our Courts bearing on these subjects. By Manley Hopkins,—Average adjuster ... .. 16s. 0d.

**ABBOTT'S (now Charles Lord Tenterden) TREATISE OF THE LAW RELATING TO MERCHANT SHIPS AND SEAMEN.** In Six Parts. By W. Shce, Sergeant-at-Law ... .. £1 12s.

**THE LAW RELATING TO MERCHANT SEAMEN,** arranged chiefly for the use of Masters and Officers in the Merchant Service. By E. W. Symons, late Chief Clerk of the Thames Police Court ... .. 6s. 0d.

**A PRACTICAL LEGAL GUIDE FOR SAILORS AND MERCHANTS DURING WAR,** with Appendices, containing the Orders in Council, and other Official Documents. By William Adam Loch ... .. 9s. 6d.



*Miscellaneous Works.*

- BAROMETER.** Manual on the Mercurial and Aneroid Barometers. By John Henry Belville, of the Royal Observatory, Greenwich ... .. 1s. 0d.
- BRITISH PORT CHARGES.** The Port Charges at nearly 600 Ports, Sub-Ports, and Creeks of Great Britain and Ireland, and the islands belonging thereto. By James Daniel .. .. . 6s. 6d.
- COMPASS (DEVIATIONS of the).** Practical Illustrations of the necessity of ascertaining the Deviations of the Compass, with explanatory Diagrams, and some account of the Compass System now adopted in the Royal Navy; Notes on Navigation, &c. &c. By Captain E. J. Johnson, R.N., F.R.S., Superintendent of the Compass Department of the Royal Navy ... .. 9s. 0d.
- COMPASS (ELEMENTARY MAGNETISM),** and the local attraction of Ship's Compasses adapted for the use of navigators. By George Parson. 1s. 6d.
- COMPASS (PRACTICAL INFORMATION ON THE DEVIATION OF THE COMPASS).** For the use of Masters and Mates of Iron Ships. By John Thomas Towson, F.R.G.S. ... .. 3s. 0d.
- COMPASS (ADMIRALTY MANUAL ON THE DEVIATION OF THE COMPASS).** By Captain J. F. Evans, R.N., F.R.G.S., and Archibald Smith, M.A., F.R.S. ... .. 4s. 6d.
- CHARTERER'S GUIDE.** Being a Guide to Merchants, Shipowners, Shipmasters, Shipbrokers, &c., in Chartering Ships, containing Tables and Rules for finding the quantity of cargo which a ship can carry, and, consequently, the freight she will earn; the rules being founded on the exact proportionate rates of freight, and not on the London printed rates, which are proved to be, in many cases, very erroneous. Containing, also, an introduction on Freight, Charterparties, and Bills of Lading, and a section on Exchange, giving Tables of the various Weights, Measures, and Moneys of all the principal kingdoms. With an Appendix, containing the Passengers' Act. By James Gordon, A.M. 5s. 0d.
- DICTIONARIES in FOREIGN LANGUAGES.** English into Danish, French, Dutch, Swedish, Italian, Russian, Spanish, &c., and *vice-versa*...from 5s. 0d. to 8s. 0d.
- FOREIGN EXCHANGES.** The Shipmaster's manual of Foreign Exchanges; being a complete guide to the character and value of the money of Hamburg, British America, France, Holland, Russia, Spain, Portugal, Italy, Greece, Malta, Gibraltar, Ionian Islands, Turkey, and the African, East Indian, and Chinese Ports; and containing Tables for the conversion of the above Moneys into British sterling; also Tables for the conversion of Deals, Battens, Deal Batten-ends into St. Petersburg Standard Dozen. By John Harper, with considerable additions by W. H. Rosser ... .. 5s. 0d.
- FOREIGN PORT CHARGES.** The Shipowner's and Shipmaster's Directory to the Foreign Port Charges, at nearly 600 of the principal Ports of the World; together with the Sailing Directions, Depth of Water, Moneys, Weights, Measures, &c. By James Daniel .. .. . 8s. 6d.
- HARRISON'S FREIGHTER'S GUIDE,** and Corn Merchant's Assistant, with Tables of First and Second Class Goods on a Decimal Scale, of which Wheat is the Standard, forming a complete Analysis of Grain and other first-class Goods. 5s. 0d.

**HORN-BOOK (SAILOR'S).** A Treatise on the Law of Storms, being a complete practical exposition of the Theory of the Law of Storms, and its uses to Mariners of all classes in all parts of the world, shown by transparent cards and useful lessons. By Henry Piddington, Esq., President of Marine Courts, Calcutta ... .. 10s. 6d.

**INSTRUCTIONS for MARINERS (TAYLOR'S),** respecting the management of Ships at Single Anchor, and General Rules for Sailing; also Directions for crossing the North Sea, with an address to Seamen; to which is prefixed a Memoir of the Author's life ... .. 1s. 0d.

**KEDGE ANCHOR;** or, Young Sailor's Assistant. A work appertaining to the practical evolutions of modern seamanship, rigging, knotting, splicing, blocks, purchases, running-rigging, and other miscellaneous matters applicable to ships of war and others; illustrated with seventy engravings. Also Tables of rigging, spars, sails, blocks, canvas, cordage, chain and hemp cables, hawsers, &c., relative to every class of vessels. By William Brady, U.S. Navy ... 16s. 0d.

**LIGHTS AND TIDES OF THE WORLD.** A complete list of the Light-houses and Light-vessels in the world; particularly describing the nature of the lights exhibited, and the distances from which they are visible. Also, the time of High Water on the days of full and change of the Moon, and the rise of spring-tides, at all the principal headlands, ports, and rivers; to which is added a Tidal Chart of the World, showing at a glance the motion of the Tidal Wave. By W. H. Rosser and Jas. F. Imray ... .. 5s. 0d.

**LORIMER'S LETTERS.** Being a Series of Letters addressed to a young Master Mariner on some subjects connected with his calling. By Charles Lorimer. 6s. 0d.

**MERCANTILE MARINE MAGAZINE,**—Containing Sailing Directions—Meteorological Observations at Sea—Board of Trade Reports—Rewards and Testimonials to Merchant Officers, &c. &c.—Nautical Notes—Monthly Notices of Lights and Buoys—Rocks and Shoals—New Charts and Nautical Publications, &c. Published Monthly, price 6d., and in Yearly Volumes (bound in cloth) ... .. 7s. 6d.

Vols. I. to XII. may be had.

**MEDICAL GUIDE (SEAMEN'S).** For preserving the Health of a Ship's Crew, containing plain Directions for the Use of the Medicines in the Cure of Diseases, &c., with full instructions for the treatment of Fractures and Dislocations; also the best Method of restoring suspended animation from drowning, &c. Illustrated by numerous engravings. The Admiralty scale of medicines according to the Act 7 and 8 Vict. cap. 112, is also given ... .. 2s. 6d.

**MANUAL (SEA OFFICER'S).** Being a Compendium of the Duties of a Commander; First, Second, Third, and Fourth Officer; Officer of the Watch; and Midshipman in the Mercantile Navy. By Captain A. Parish, of the East India Merchant Service, and late of the Honourable East India Company's Service. 5s. 6d.

**MATE and his DUTIES.** Containing remarks on Discipline, causes of Mutiny, erroneous treatment of Young Mates, Forecastle Bullies, duties towards the Master, Duties of the Watch, &c. &c. ... .. 2s. 0d.

**MASTING, MAST-MAKING, AND RIGGING OF SHIPS.** A Treatise upon these subjects, with Tables of Spars, &c., relative to every class of vessels. By Robert Kipping ... .. 1s. 6d.

**MARINE and NAVAL ARCHITECTURE.** A Treatise on the theory and practice of Ship-building. Illustrated with more than 50 Engravings. By John W. Griffiths. Bound in cloth ... .. £1 11s. 6d.

**MARRYAT'S SIGNALS.** A Code of Signals for the use of Vessels employed in the Merchant Service. By Captain Marryat, R.N. ... .. 12s. 0d.

**NAVY LIST.** The Mercantile Navy List, and annual appendage to the Commercial Code of Signals for all nations. Edited by J. H. Brown, Esq., Registrar-General of Seamen and Shipping. In two parts ... .. 10s. 0d.

**PHYSICAL GEOGRAPHY of the SEA.** A work descriptive of various natural phenomena, the Winds, Tides, Currents, &c. With illustrative charts and diagrams. By Lieut. M. F. Maury, LL.D., U.S. Navy ... .. 8s. 6d.  
An English edition ... .. 5s. 0d.

**REED'S SHIPOWNERS' and SHIPMASTERS' HANDY-BOOK.** Containing the Newcastle Statute Coal Measure converted into Weight, Tables of Proportionate Rates of Freight on Coals, Grain, &c., Scale of Sizes of Rope and Chain Cables and Anchors required according to Ship's Tonnage, Table of the Quantity of Rope which makes a Hundredweight, East India Tonnage Scales, New York and the Black Sea Rates of Freight, relative Rates of Freight per Ton and per Quarter, average weight of Wheat, Burley, Oats, Beans and Peas, Tables of the comparative Stowage of Goods, Corn Measures of the different Ports in Europe, Proportionate Rates of Freight for Leghorn, Genoa, Trieste, and Marseilles, Lloyd's Instructions for the Stowage of Grain Cargoes at Montreal, Dimensions and Contents of Wine and Spirit Casks, Lloyd's Scale of the Weights of Anchors, Sizes of Cables, &c., Value of Foreign Moneys in British Currency, Table for calculating Seamen's Wages, Victualling Scale for Merchant Vessels, Table of Quantities of Provisions required for any number of Men for one Month, and other Information valuable to those engaged in Commerce.  
1s. 0d.

**SAILMAKING (ELEMENTS of).** A Treatise on Cutting-out Sails according to the most approved methods in the Merchant Service, with draughting, and the centre of effort of the sails. Illustrated with engravings; and containing Tables of the full and accurate dimensions for Jibs, Mainsails, &c. &c. By Robert Kipping ... .. 2s. 6d.

**SEAMAN'S FRIEND.** Containing a Treatise on Practical Seamanship, with Plates; a Dictionary of Sea Terms; Customs and Usages of the Merchant Service; and the American Laws relating to the Practical Duties of Masters and Seamen. By R. H. Dans. (The American Edition) ... .. 5s. 0d.  
An English Edition by James Lees ... .. 5s. 0d.

**STORMS (LAW of).** A work giving a full exposition of the Theory of the Law of Storms, with Rules for avoiding Hurricanes, &c. Illustrated with numerous explanatory woodcuts. By W. R. Birt, Esq. ... .. 5s. 0d.

**STORM-WARNING SIGNALS.** Pocket Companion to the Board of Trade Storm-Warning Signals, together with Remarks on the use of Instruments in foretelling Weather ... .. 0s. 3d.

**SOUNDINGS.** The use of the Lead, or how to correct the Soundings; with an explanation of the general set of the Tides in the Irish Sea, the English Channel, and North Sea; with directions for making an allowance for them. By Admiral Beechey, R.N. ... .. 2s. 6d.

**STOWAGE.** A Treatise on the Stowage of Ships and their Cargoes, in which full instructions are given for stowing away various kinds of goods. By Robert White Stevens ... .. 8s. 0d.

**SIGNAL LIGHTS.** The new Admiralty Regulations respecting Light and Fog-signals ... .. 1s. 6d.

**SIGNAL LIGHTS.** A Treatise on the law relating to Sea-lights, and the rule of the road at sea; with numerous Cases to the present time; foreign ordinances and translations; and an Appendix containing the new Admiralty Regulations respecting Ship-lights and Fog-signals. By Frederic Thomas Pratt, D.C.L., Advocate, Doctors' Commons ... .. 9s. 0d.

**THERMOMETER.** Manual on the Thermometer, with some Remarks upon its history and use as a meteorological instrument. By J. H. Belville 1s. 0d.

**TIDES.** Tables showing the direction and rate of the Stream throughout the St. George's or Irish Channel. Adapted to Holden's Tide Tables. By Admiral Beechey, R.N. ... .. 2s. 6d.

**TIDES and TIDAL CURRENTS.** An essay on the Tides and Tidal Currents of the Irish Sea and English Channel, being the substance of a Lecture delivered by the Rev. Samuel Haughton, M.A., Fellow of Trinity College, Dublin, at the Sailors' Home, Liverpool, on the 13th June, 1857. With an Appendix, containing numerous carefully-constructed Examples, for the use of Masters and Mates intending to pass their examination in the Tides before the Local Marine Boards. Published by request ... .. 3s. 0d.

**TIDE TABLES (DAILY),** for 24 British and French Ports with Constants for 280 other places of the United Kingdom and Coasts of Europe. By Staff-Commander J. Burdwood, R.N. ... .. 1s. 6d.

**TONNAGE of SHIPS (TABLES of the).** Calculated according to the Rules prescribed by Law, including every description of Vessels from 12 to 600 tons, together with a complete Explanation of the Methods of Admeasurement, both by the New and Old Methods ... .. 4s. 0d.

**WINDS (THEORY of the).** A Treatise read before the American Scientific Association at Providence, August 20th, 1855, accompanied by a Map of the World, showing the extent and direction of the Winds; with an Appendix containing Sailing Directions for a voyage round the World, and nautical remarks upon various Ports. By Captain Charles Wilkes, U.S. Navy, late Commander of the United States' Exploring Expedition to the Pacific and Indian Oceans. 8s. 6d.

**WINDS and their COURSES.** A practical Exposition of the Laws which govern the Movements of Hurricanes and Gales, with an examination of the circular theory of Storms as propounded by Redfield, Sir William Reid, Piddington, and others. By G. Jinnau. Illustrated by Diagrams ... .. 3s. 6d.

---

*Sailing Directories.*

**INDIAN OCEAN DIRECTORY.** The Seaman's Guide to the navigation of the Indian Ocean, including the principal Ports on the South and East Coasts of Africa, the Arabian Sea, the Bay of Bengal, the North-West, West, and South Coasts of Australia; together with special Descriptions and Sailing Directions for all the Islands, and Notes on making Passages, extensively illustrated with Diagrams of the Winds, Current, and Track Charts, plans of Harbours, Islands, &c. &c. By W. H. Rosser, and James F. Imray, F.R.G.S. 25s. 0d.

**NORTH ATLANTIC DIRECTORY.** Notes on the Physical Geography and Meteorology of the North Atlantic, with Sailing Directions for the Principal Ports. Being a complete Directory for the Navigation of the North Atlantic. By W. H. Rosser. This book contains full particulars as to the Wind and Weather, Currents and Tides of all parts of the North Atlantic, together with Remarks on the Variation of the Compass, Deep Sea Soundings, and all the Rocks and Shoals that have at various times been reported; ample Instructions respecting making Passages from Port to Port; notes on Tropical and Extra-Tropical Hurricanes, and on the use of Meteorological Instruments at Sea; copious Directions for making and leaving all the principal Ports and Harbours, the character of the various Anchorages, &c., and all other Information useful for the Navigation of this Ocean ... .. 10s. 6d.

**SOUTH ATLANTIC DIRECTORY.** Notes on the physical geography and meteorology of the South Atlantic, together with Sailing Directions for the principal Ports of Call, and for the Islands; to which is appended a Catalogue of all the doubtful Islands, Rocks, and Shoals. With numerous charts illustrating the Winds and Currents. By W. H. Rosser ... .. 6s. 0d.

**ATLANTIC DIRECTORY.** The two works (North Atlantic Directory and South Atlantic Directory,) bound together, in one volume ... .. 15s. 0d.

**BAY OF BENGAL DIRECTORY.** Containing Sailing Directions for the principal ports in the Bay of Bengal, and particularly describing the Andaman and Nicobar Islands. To which are added a description of the Currents prevailing during the South-west and North-east Monsoons, an account of the Monsoons, some remarks on Passages across the Bay, and a Table of determined Positions. With numerous plans of Harbours and charts of the Currents. By W. H. Rosser and James F. Inray ... .. 6s. 0d.

**BRITISH and FOREIGN COASTER'S GUIDE.** Containing complete Sailing Directions for the East Coasts of England and Scotland, the Orkney and Shetland Islands, the Coasts of France, Holland, and Jutland to the Skaw Point, those of Norway and the White Sea, the Kattegat, Baltic, and Gulf of Finland, and the English Channel, particularly describing the Soundings, bearings of the lighthouses, beacons, and buoys, &c., from the rocks, shoals, and other dangers, with the prevailing winds, tides, and sets of the currents, and illustrated with several views of the lighthouses, plans of Harbours, &c. &c. Compiled from the latest surveys made by order of the British, French, Danish, Prussian, Swedish, and Russian Governments ... .. 7s. 0d.

Or, with the addition of a Directory for the St. George's Channel, and coast round Ireland ... .. 10s. 0d.

**HORSBURGH'S DIRECTORY.** A directory for the Indian Ocean; containing full instructions for visiting the various ports of India, China, and Australia. By James Horsburgh ... .. £4 6s.

The same work, bound in two volumes ... .. £4 10s.

**PACIFIC DIRECTORY.** A directory for the navigation of the Pacific Ocean, with descriptions of its coasts, islands, &c., from the Strait of Magelhaen to the Arctic Sea, and those of Asia and Australia; its winds, tides, currents, and other phenomena. In 2 volumes. By Alexander G. Findlay, F.R.G.S. ... .. £3 3s.

**WESTERN PACIFIC OCEAN.** A description of the Islands in the Western Pacific Ocean, north and south of the equator. By Andrew Cheyne. ... .. 8s. 6d.

**BAHARIE'S COASTING GUIDE.** For the East Coast of England and Scotland, and the English Channel; containing the questions, remarks, and instructions to candidates for the situation of Masters and Mates of Ships. By Alexander Baharie ... .. 5s. 0d.

**COASTS OF BRITISH AMERICA AND THE UNITED STATES.** Complete Sailing Directions for all the Bays, Harbours, Roadsteads, &c. &c. Compiled chiefly from the surveys made by order of the British, French, and United States Governments. Bound in cloth ... .. 7s. 0d.

**DIRECTIONS FOR THE EAST COASTS OF NORTH AND SOUTH AMERICA.** By G. W. Blunt. Published in New York ... .. 25s. 0d.

**ISLANDS OF THE WEST INDIES AND COAST OF COLUMBIA,** containing particular instructions for frequenting each Harbour, and important remarks on the Winds, Tides, Currents, &c. Bound in cloth ... .. 7s. 0d.

**COASTS OF CALIFORNIA, OREGON, AND CENTRAL AMERICA,** being a Sailing Directory for the various Bays, Harbours, Roadsteads, &c., along the Coast from Panama to Vancouver Island. Illustrated with various views of the Coast ... .. 7s. 0d.

- SOUTH AFRICA, AND ISLANDS OF REUNION, MAURITIUS, AND RODRIGUES**, fully describing the coast of South Africa from Table Bay to Port Natal, and the principal Harbours in Reunion, Mauritius, and Rodrigues. By James F. Imray, F.R.G.S. ... .. 3s. 0d.
- ENGLISH CHANNEL PILOT.** Published by the Admiralty. In two Volumes. 10s. 0d.
- NORTH SEA PILOT.** Published by the Admiralty. In four Volumes. 10s. 0d.
- NORWAY PILOT.** Published by the Admiralty. Christiania Fiord to Wardohuus, near the North Cape. In two Volumes ... .. 3s. 6d.
- DANISH PILOT.** Published by the Admiralty ... .. 4s. 6d.
- GULF and RIVER ST. LAWRENCE PILOT.** Published by the Admiralty. In two Volumes ... .. 7s. 0d.
- WEST INDIA PILOT.** Published by the Admiralty. In two Volumes. 10s. 0d.
- SOUTH AMERICA PILOT.** Published by the Admiralty. Maranham to Panama. In two Volumes ... .. 10s. 0d.
- CHINA PILOT.** Published by the Admiralty. Canton River to the Sea of Okhotsk ... .. 10s. 6d.
- GULF of SIAM DIRECTIONS.** Published by the Admiralty ... 1s. 0d.
- AUSTRALIA DIRECTORY.** Published by the Admiralty. In three Volumes, about 5s. each volume.
- NEW ZEALAND PILOT.** Published by the Admiralty ... .. 5s. 0d.
- ENGLISH CHANNEL PILOT**, containing Directions for navigating the English Channel, the Bristol Channel, South Coast of Ireland, and Coast of Franco from Calais to Brest, including the Scilly Islands, and the Islands of Jersey, Guernsey, Alderney, Sercq, and Herm ... .. 4s. 0d.  
Or, with an Addenda extending to Liverpool and Dublin ... .. 5s. 0d.
- RIVER THAMES**, from London to the Nore and Sheerness, and thence through the Swin and King's Channels, and through the Queen's, South, and Prince's Channels, to Margate and the Downs; to which are annexed Tables of the New Rates of Pilotage ... .. 2s. 0d.
- ST. GEORGE'S and BRISTOL CHANNELS**, together with the **WHOLE COAST ROUND IRELAND**, particularly describing all the Sands, Shoals, Rocks, and other Dangers in this navigation ... .. 4s. 0d.
- DIRECTORY for the SOUTH, WEST, and NORTH COASTS of IRELAND**, from Carnsore Point to Lough Foyle, particularly describing the various Harbours, Anchoring Places, Recks, Shoals, &c., compiled from the surveys made by order of the Lords Commissioners of the Admiralty, by Commanders Mackenzie, Huddart, Mudge, Martin White, Vidal, J. Woolfe, &c. &c. ... .. 2s. 6d.
- ST. GEORGE'S and BRISTOL CHANNELS**, and part of the West Coast and Islands of Scotland ... .. 3s. 0d.
- BRISTOL CHANNEL**, in which are described all the Shoals, Rocks, Buoys, Lights, &c. ... .. 2s. 0d.
- EAST COAST of ENGLAND**, from the South Foreland to Flamborough Head, in which are described the Headlands, Bays, Harbours, Rocks, Sands, Buoys, Beacons, Light-vessels, &c. ... .. 2s. 6d.
- EAST COAST of ENGLAND**, from Orfordness to Flamborough Head, describing all the Rocks, Shoals, Buoys, &c. ... .. 2s. 0d.

- EAST COAST of ENGLAND**, from Orfordness to the River Tyne, particularly describing all the Harbours, Anchoring Places, &c. ... 2s. 6d.
- EAST COASTS of ENGLAND and SCOTLAND**, from Flamborough Head to the Orkneys and Shetland Islands, including the most recent alterations and notices made and issued by the Honourable Corporation of Trinity House, and other important official publications ... 2s. 6d.
- EAST COAST of ENGLAND**, from Dungeness to the Tyne ... 3s. 0d.
- SAILING DIRECTIONS for the NORTH SEA** south of Flamborough Head on the west side, and south of Seaw Point on the east side... 3s. 0d.
- The FIRTHS of FORTH and TAY**, including the Coast from St. Abb's Head to Buttonness, particularly describing the Harbours, Sands, Shoals, Lighthouses, Buoys, Beacons, &c. ... 1s. 0d.
- The WEST COAST of SCOTLAND and the HEBRIDES**, particularly describing all the various Islands, Loughs, Harbours, Lighthouses, Shoals, Rocks, &c. ... 3s. 0d.
- The NORTH SEA PILOT**; containing Sailing Directions for Navigating the NORTH SEA, its Bays and Harbours; particularly describing the Channels from London through the Swin to Hollesley Bay and the Downs, and the Coasts of England and Scotland, from Orfordness to Cape Wrath, with the Orkney and Shetland Islands, and the opposite Coasts of France, the Netherlands, &c., from Cape Grisez to the Skaw ... 4s. 0d.
- The NORTH COAST of HOLLAND**, particularly describing the rivers east of the Texel to Hamburg and Horn's Reef ... 2s. 0d.
- THE KATTEGAT**. From Skagen to the Sound ... 1s. 6d.
- The KATTEGAT, SOUND, and BELTS**, from the Skagen to Helsingor, the Harbours on the Swedish Coast, the East Coast of Jutland, the Great and Little Belts, and the ports of Holstein and Mecklenburg ... 2s. 6d.
- The BALTIC or EAST SEA**, from Helsingor (Elsinore) to the Gulf of Bothnia, and the entrance to the Gulf of Finland; including a general description of its Coasts, Harbours, Islands, Rocks, Sands, Shoals, Beacons, Buoys, Lighthouses, &c. ... 2s. 0d.
- The GULF of FINLAND**, including a particular description of the Coasts, Harbours, Islands, Shoals, Rocks, Lights, Buoys, Beacons, &c. ... 2s. 0d.
- GULF of BOTHNIA**. A general description of the various Bays, Harbours, &c., contained within the Gulf ... 2s. 0d.
- The WHITE SEA**, to Arkhangel, Onega, Gulf of Kandalax, and Bay of Messen, with general directions from England to the North Cape ... 1s. 0d.
- The BAY of BISCAY**, from Ouessant Island to Cape Finisterra, compiled from the most recent surveys ... 2s. 0d.
- The COASTS of SPAIN and PORTUGAL**, from Cape Ortegat to the Strait of Gibraltar ... 2s. 0d.
- The WEST COASTS of FRANCE, SPAIN, and PORTUGAL**, from Ouessant Island to the Strait of Gibraltar: ... 3s. 0d.
- The MEDITERRANEAN NAVIGATOR**, containing Sailing Directions for the Mediterranean Sea, Gulf of Venice, Archipelago, Black Sea, and the North Coast of Africa, with a full description of the Winds, Tides, Currents, &c. ... 5s. 6d.
- The same work, bound in cloth ... 7s. 0d.

- THE MEDITERRANEAN SEA, (PART I.),** containing a Nautical description of all the Bays, Harbours, Anchoring Places, &c., on the Coast of Europe, from Cape Trafalgar to Cape Spartivento, in Italy; and on the Coast of Africa, from Cape Sparte to Cape Bon ... .. 2s. 6d.
- THE MEDITERRANEAN SEA, (PART II.),** containing a Nautical description of the Coasts and Islands of the Grecian Archipelago, the Seas of Marmora and Azov, the Black Sea, Levant, and Coast of Africa, from Alexandria to Cape Bon. ... .. 3s. 6d.
- MEDITERRANEAN SEA (Central Portion of)** particularly describing the Island of Sicily ... .. 2s. 0d.
- ADRIATIC and GULF of VENICE,** particularly describing the various Bays and Harbours in that Sea ... .. 2s. 0d.
- BLACK SEA, and SEAS of MARMORA and AZOV,** containing full instructions for navigating those Seas, and for visiting the Ports of Odessa and Galatz, &c. ... .. 2s. 6d.
- LEVANT,** or Eastern portion of the Mediterranean Sea; an elaborate description of its Islands and Coasts, as also directions for its Harbours, &c. &c. ... .. 2s. 0d.
- ISLAND of NEWFOUNDLAND and BANKS,** with the adjacent coast of Labrador, extending to Sandwich Bay ... .. 2s. 6d.
- COAST of NORTH AMERICA (Part 1),** from the Strait of Belle Isle to Cape Canso; including the island of Newfoundland and Banks, with the adjacent coast of Labrador to Sandwich Bay, and the Gulf and River St. Lawrence ... .. 3s. 0d.
- COAST of NORTH AMERICA (Part 2),** from Cape Canso to New York; being a nautical description of the various bays and harbours contained within those limits. Compiled, principally, from the surveys made by order of the British and United States' Governments ... .. 4s. 0d.
- COAST of NORTH AMERICA (Part 3),** from New York to the Strait of Florida. A work similar to the foregoing ... .. 2s. 0d.
- COAST of NORTH AMERICA,** comprehending the entire navigation from Nova Scotia to the Gulf of Florida ... .. 5s. 6d.
- WEST INDIA DIRECTORY,** containing directions for navigating the Islands of Porto Rico, Haiti or St. Domingo, Jamaica, Cuba, and the Bahamas, together with the Mona and Windward Passages, with the Gulfs of Florida and Mexico, Bays of Honduras and Mosquito, with the adjacent Islands ... .. 5s. 0d.  
With an Addenda, containing a description of the Caribbee Islands ... .. 6s. 0d.
- COAST of COLOMBIA and CARIBBEAN SEA,** containing particular instructions for frequenting each Harbour, and important remarks on the Winds, Tides, Currents, &c. ... .. 2s. 6d.
- COAST of BRAZIL,** from Maranham to Cape Frio and Rio Janeiro, including Remarks on the Winds, Currents, Seasons, &c., and Instructions for the Routes from Europe and the United States to the principal Ports ... .. 3s. 6d.
- COAST of BRAZIL,** from Cape Frio and Rio Janeiro to Cape Santa Maria. Compiled mainly from the Surveys made by Baron Roussin, and M. Barral of the French Navy ... .. 2s. 0d.
- BRITISH SHIPMASTER'S HAND-BOOK to RIO GRANDE DO SUL (BRAZIL).** By the Honourable Henry Prendergast Vereker, LL.D., British Consul at the Port ... .. 2s. 6d.



## Log Books, &c.

### Plain Paper, superfine Writing quality.

		s. d.
No. 1.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	2 0
„ 2.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	3 6
„ 3.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 276 pages	5 0
„ 4.	„ 12 months, 1 day's work on a page.—Half-bound . 368 „	6 0

### Ruled heading and faint lines.

„ 5.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	2 6
„ 6.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	4 0
„ 7.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 276 pages	5 6
„ 8.	„ 12 months, 1 day's work on a page.—Half-bound . 368 „	6 6

### Ruled in form, for one day's work on a page.

„ 9.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	3 0
„ 10.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	4 6
„ 11.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 276 pages	6 6
„ 12.	„ 12 months, 1 day's work on a page.—Half-bound . 368 „	8 0

### Printed in form. One day's work on a page.

„ 13.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	3 6
„ 14.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	5 0
„ 15.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 276 pages	7 0
„ 16.	„ 12 months, 1 day's work on a page.—Half-bound . 368 „	9 0

### Printed in form. Two days' work on a page.

„ 17.	For 6 months, 2 days' work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	3 6
„ 18.	„ 12 months, 2 days' work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	5 0
„ 19.	„ 24 months, 2 days' work on a page.—Half-bound . 368 „	9 0

### Printed in form for STEAM-SHIPS.

„ 20.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	4 0
„ 21.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	6 0
„ 22.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 276 pages	8 0
„ 23.	„ 12 months, 1 day's work on a page.—Half-bound . 368 „	10 0

### Printed in form for ENGINEERS.

„ 24.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides. . . . . 92 pages	4 0
„ 25.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 184 pages	6 0
„ 26.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides. . . . . 276 pages	8 0
„ 27.	„ 12 months, 1 day's work on a page.—Half-bound . 368 „	10 0

**LOG BOOKS (Continued).**

**Printed in AMERICAN Form.**

**One or two days on a page.**

No.	Description	Pages	s.	d.
No. 28.	For 3 months.—Cloth backs and stiff blue sides . . .	92	3	6
„ 29.	„ 6 months.—Bazil backs and stiff blue sides . . .	184	5	0
„ 30.	„ 9 months.—Bazil backs and stiff blue sides . . .	276	7	0
„ 31.	„ 12 months.—Half-bound . . . . .	368	9	0

*Notes.*—With instructions for the use of the Log Book, on the Deviation of the Compass and various causes of error in the Ship's Course; directions in Cases of Wreck; management of Boats in a broken sea; directions for restoring persons apparently drowned; scale of medicine, and also of provisions for British Merchant Ships; ruled form for list of passengers and the Ship's Company.

**Printed in form. One day's work on a page.**

No. 32.	For 3 months, 1 day's work on a page.—Cloth backs and stiff blue sides . . . . .	92	3	6
„ 33.	„ 6 months, 1 day's work on a page.—Bazil backs and stiff blue sides . . . . .	184	5	0
„ 34.	„ 9 months, 1 day's work on a page.—Bazil backs and stiff blue sides . . . . .	276	7	0
„ 35.	„ 12 months, 1 day's work on a page.—Half-bound. . . . .	368	9	0

The above are with special columns for the names of the persons on the Look-out, and the hours during which the Lights are exhibited according to the Merchant Shipping Act.

**LOG BOOK for keeping a Daily Record of the Winds and Currents; the readings of the Barometer and Thermometer, and Deviation of the Compass, &c.; in accordance with Lieut. Maury's Plan.**

No. 36.	For 3 months, 1 day's work on a page.—Bazil backs and stiff blue sides . . . . .	184	6	0
„ 37.	„ 6 months, 1 day's work on a page.—Half-bound . . . . .	368	12	0
„ 38.	„ 12 „ „ „ „ „ „ . . . . .	736	24	0

**SHIPS' PROVISION BOOKS.**

**With Wines.—Printed in Form.**

Description	Pages	s.	d.
For 6 months.—Half-bound . . . . .		2	0
„ 12 „ „ . . . . .		3	6
„ 18 „ „ . . . . .		5	6
„ 24 „ „ . . . . .		7	0

**Without Wines.—Printed in Form.**

For 6 months.—Half-bound . . . . .		1	6
„ 12 „ „ . . . . .		2	6
„ 18 „ „ . . . . .		4	0
„ 24 „ „ . . . . .		6	0

**SEAMEN'S WAGES BOOKS.—Printed in Form.**

Description	Pages	s.	d.
For 12 men.—Half-bound . . . . .		1	6
„ 18 „ „ . . . . .		2	0
„ 24 „ „ . . . . .		2	6
„ 30 „ „ . . . . .		3	0
„ 36 „ „ . . . . .		3	6
„ 42 „ „ . . . . .		4	0
„ 48 „ „ . . . . .		4	6
„ 54 „ „ . . . . .		5	6

Appended to these is an extract of the Law relative to the payment of Wages, also two Tables for the calculation of Wages, by means of which any fractional part of a pound can be calculated per day or month. No other Wages Book that we have seen gives such information.

## CARGO BOOKS.

Captains'—printed . . . . .	s. d.
Mates' " . . . . .	2 6
" " . . . . .	1 6
" " . . . . .	1 0
" " . . . . .	0 8
Cargo Book " (much used by Coasters) . . . . .	1 0

With instructions for receiving Cargoes on Board, and Bills of Lading, &c. &c.

## CAPTAINS' ACCOUNT BOOKS.

1 qr.—plain, in marble paper . . . . .	1 6
2 qr. " half-bound . . . . .	3 6
1 qr.—ruled faint, in marble paper . . . . .	1 6
2 qr. " half-bound . . . . .	3 6
1 qr.—ruled faint and £ s. d., in marble paper . . . . .	1 9
2 qr. " " half-bound . . . . .	4 0

## SHIPS' JOURNALS.

1 qr.—printed, one or two hours . . . . .	2 6
2 qr. " " half-bound . . . . .	5 6
3 qr. " " " . . . . .	7 0

## LOG SLATES, folding.

SIZE IN INCHES.	9 by 13	10½ by 14½	11½ by 16.
Very strong, for ship's use . . . . .	2s. 6d.	3s. 0d.	3s. 6d.
Single slates . . . . .	0 6	0 9	1 0

CHART CASES. In Tin (Japanned), with lock and key.  
(For preserving Publications from damp.)

No. 1	42 inches in depth, and 6 inches in diameter . . . . .	£ s. d.
" 2	" " " 6 " " . . . . .	0 7 6
" 3	" " " 9 " " . . . . .	0 10 0
		0 15 0

MARRYAT'S COMMERCIAL SIGNALS,—Roped and toggled  
complete. In painted boxes.

*Of the best Bunting Manufactured.*

No.	No. of Flags.	Size	Pendants	11 ft.	3 10 0
1	16	4 ft. 6 in. × 3 ft. 0 in.	"	12 ft.	4 15 0
2	16	" 5 ft. 0 in. × 3 ft. 9 in.	"	13 ft.	5 0 0
3	16	" 5 ft. 6 in. × 3 ft. 9 in.	"	14 ft.	5 10 0
4	16	" 6 ft. 0 in. × 4 ft. 6 in.	"	15 ft.	5 15 0
5	16	" 6 ft. 6 in. × 4 ft. 6 in.	"	16 ft.	6 10 0
6	16	" 7 ft. 0 in. × 5 ft. 0 in.	"	17 ft.	7 15 0
7	16	" 8 ft. 0 in. × 6 ft. 0 in.	"		

BOARD OF TRADE COMMERCIAL SIGNALS,—Roped and  
toggled complete. In painted boxes.

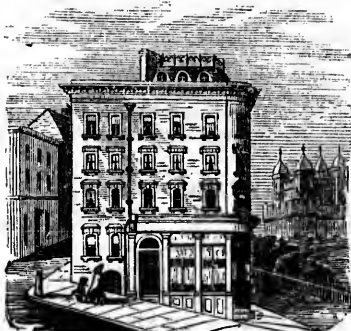
*Of the best Bunting Manufactured.*

No.	No. of Flags.	Size	Pendants	11 ft.	4 10 0
1	19	4 ft. 6 in. × 3 ft. 0 in.	"	12 ft.	5 10 0
2	19	" 5 ft. 0 in. × 3 ft. 9 in.	"	13 ft.	6 0 0
3	19	" 5 ft. 6 in. × 3 ft. 9 in.	"	14 ft.	6 10 0
4	19	" 6 ft. 0 in. × 4 ft. 6 in.	"	15 ft.	7 0 0
5	19	" 6 ft. 6 in. × 4 ft. 6 in.	"	16 ft.	7 17 6
6	19	" 7 ft. 0 in. × 5 ft. 0 in.	"	17 ft.	9 10 0
7	19	" 8 ft. 0 in. × 6 ft. 0 in.	"		

## ADDITIONAL FLAGS IN BAGS.

These Flags are intended to accompany Marryat's Signals, to enable communications to be made corresponding with the system of signals adopted by the Board of Trade. The sizes are similar to those attached to the numbers above.

	No. 1.	2.	3.	4.	5.	6.	7.
Five Flags . . . . .	20s.	26s.	32s.	35s.	38s.	42s.	55s.
Seven Flags . . . . .	27s.	35s.	42s.	50s.	54s.	57s.	72s.



CORNER OF TRINITY SQUARE, TOWER HILL.

*Nautical and Mathematical Instruments.*

	£	s.	d.
SEXTANTS of Pillar and Double Frame Pattern, best make, divided on Silver to 10 Seconds, with extra power to the inverting Telescope, and reflector to the Nonius ... ..	13	13	0
With solid cast limbs of approved patterns, from...£5 5s. to	12	12	0
Medium size, bronzed ditto, with extra power telescope, neutral tint shades, divided to 10", strongly recommended, and warranted of best quality ... ..	10	10	0
Oval Limb, Silver Arc, with inverting Telescope, &c. ...	7	7	0
Circular Limb, do. do. ... ..	6	6	0
Dollond limb with silver arch, divided to 30", inverting telescopes, mahogany case, &c., to supersede the wood frame sextant ... ..	5	10	0
Ditto Do. with Ivory Arc do. ... ..	5	0	0
QUADRANTS.—Brass, Silver Arc, Telescopes, &c., and Back Shades, in Mahogany Case, best ... ..			
Ivory Arc, in Mahogany Case, best ... ..	5	5	0
Ebony Handle, Ivory Arc, in Mahogany Case, best ... ..	4	4	0
Single Observation, Ivory Arc, plain and common ... ..	3	15	0
with Double Tangent ... ..	2	5	0
and Vertical Screws ... ..	2	10	0
and Back Shades ... ..	2	18	0
TELESCOPES to any of the above... .. extra	0	8	0
ARTIFICIAL HORIZONS, with parallel glasses and mercury, complete... ..	4	4	0

	£	s.	d.
<b>BINNALES.</b> —Dolphin Pattern, large size, with Lamps and Shade, crown top ... .. £14 14s. 0d., £15 15s. 0d., and	17	17	0
„ Skylight Pattern, crown top ... £4 4s. 0d., £5 5s. 0d., and	6	6	0
„ Octagon Pattern, wood, £6 6s. 0d., £8 8s. 0d., £9 9s. 0d., and	11	11	0
„ Pillar, crown top ... .. £7 7s. 0d., £9 9s. 0d., and	12	12	0
N.B.—Binnacles of any pattern made to order.			
<b>COMPASSES.</b> —Plain Azimuth, with Sight ... ..	3	3	0
„ „ Azimuth „ „ „ „ „ „	5	5	0
„ Best Prismatic Azimuth, with Sights ... ..	6	6	0
With Tripods, £1 1s. extra.			
„ Mast Head Compasses, for avoiding the Local Attraction, of any size. With Cylinder Shade and Lamps. Various prices.			
„ Amplitude, „ „ „ „ „ „ £1 0s. 0d. to	2	10	0
„ Stand for the above „ „ „ „ „ „ extra	1	5	0
„ Brass Steering, 8, 9, 10, and 11 in. „ „ „ „ from 13s. to	1	1	0
„ Wood ditto „ „ „ „ „ „ from 6s. 6d. to	0	10	6
„ Brass Hanging ditto „ „ „ „ „ „ from £1 to	1	5	0
„ Every variety of Brass Boat ditto „ „ „ „ from 10s. to	1	1	0
„ Wood ditto „ „ „ „ „ „ from 3s. 6d. to	0	6	0
„ Pocket ditto, in brass „ „ „ „ „ „ from	0	1	6
<b>BAROMETERS.</b> —Best rosewood, marine, with Sympiesometer and Thermometer ... .. £5 5s. 0d. to	6	6	0
„ Best rosewood, with arm and Thermometer, circular front, ivory scales, and rack motion ... .. £2 10s. 0d. to	3	3	0
„ Ditto, with round head, and improved tube and cistern, common ... ..	2	10	0
„ Plain ditto, with Thermometer on the door in front ... ..	2	0	0
„ Wheel Pattern, various sizes, and mounting, from £1 5s. 0d. to	6	6	0
<b>ANEROID BAROMETER,</b> do... .. from £2 10s. 0d. to	3	10	0
<b>SYMPIESOMETERS</b> ... .. from	2	2	0
<b>THERMOMETERS.</b> —8 inches long, with box scale ... ..	0	1	6
„ 8, 10, 12, and 14 inch Brewers' ditto, in Japan or Copper cases ... .. from 3s. 6d. to	1	0	0
„ Night and day, for registering the greatest degree of heat or cold during the absence of the observer, from 12s. 6d. to	1	5	0
„ Marine, in a strong copper case, principally used for taking the soundings, and ascertaining the temperature at the bottom and at the surface of the Sea... .. from £1 5s. to	4	4	0
<b>TELESCOPES.</b> —One, two, and three draw ... .. from £1 0s. 0d. to	2	10	0
„ Of superior quality, large object-glasses... .. £2 0s. 0d. to	6	6	0
<b>DOUBLE GLASSES,</b> especially adapted to the use of captains and pilots, &c., at night ... .. £2 2s. 0d. to	5	10	0
<b>LOG GLASSES,</b> 14 and 28 seconds, common ... .. each	0	1	6
„ In brass frame ... ..	0	2	6
„ Half-hour solid Glasses ... ..	0	2	6
„ One-hour ditto ... ..	0	4	6
„ Two-hours ditto ... ..	0	5	0
<b>Bar and Compound Magnets</b> ... .. from 15s. 0d. to	2	2	0
<b>Tape measures,</b> from one pole to six poles in length, divided for land surveying, or the measurement of timber, in leather boxes, &c... 5s. to	0	15	0
<b>Brass Speaking Trumpets</b> ... .. from 5s. 6d. to	0	18	0
<b>Storm Glasses, or Prognosticators</b> ... .. from 6s. 6d. to	0	14	6
<b>Steel Joint Dividers, 4, 5, 6, 7, and 8 inch</b> ... .. per dozen, 12s. 0d. to	1	10	0
„ with Shifting Leg ... .. £1 10s. 0d. to	3	0	0
<b>Brass Joint Dividers, 4, 5, 6, 7, and 8 inch</b> ... .. per dozen 9s. to	0	15	0
„ with Shifting Leg... .. 18s. 0d. to	1	16	0

	£	s.	d.
Compasses with Pen and Pencil Points, and box scale, in case... ..	0	4	6
„ with Steel Joints ... ..	0	8	6
Set of Instruments, with Scale, in fish-skin case ... ..	0	8	6
„ with Steel Joints ... ..	0	10	6
„ and Bow Pen ... ..	0	12	6
„ Steel Joint Instruments, with Bow Pen, Ivory Scale, Sector, and Brass Protractor ... .. 7s. 6d., 12s., 16s. and	1	2	6
„ Turned Check Instruments, and Ivory Protractor ... ..	1	15	0
„ Round Shank ditto, with Lengthening Bar ... ..	2	2	0
Ebony Parallel Rules, 6, 9, 12, 15, 18, 21, and 24 inch ... from 1s. to	0	6	0
Two-foot Box Gunter's Scales ... ..	0	2	0
„ improved by Don ... ..	0	5	0
„ Sliding Gunter's Scale ... ..	0	7	6
10, 12, 15, 18, and 21 inch Globes, in black frames ...from £2 12s. 6d. to	10	10	0
„ in high mahogany frames ... .. from £4 4s. 0d. to	21	10	0

**Captain Smallman Toovey's Azimuth Dial.**

This Instrument for determining the *error* of the Compass (*variation* and *deviation* combined) at sea, is a modification of what is called the Dumb Card; it is used in connexion with Godfray's *Time Azimuth Chart*, and the two will be found very useful auxiliaries to all who are in command of iron ships and steamers. Price, with tripod stand ... .. £5 10s. 0d.

**ADJUSTMENT OF IRON SHIPS' COMPASSES.**

This branch of the business is conducted by Mr. W. H. ROSSER, who has for some years past paid special attention to the adjustment of Compasses on board Iron Vessels; during which period he has adjusted the Compasses of many of the largest vessels in the principal Ports of the United Kingdom, a list of which may be had on application.

**IMRAY and SON'S NEWLY-INVENTED  
SPRING-COMPASS.**

This Compass is particularly adapted for Iron Screw Steam-ships, or Vessels that have much vibratory motion. The invention can be applied to any Compass already in use, at a charge of £2 2s.

**IMRAY and SON'S IMPROVED FLOATING COMPASS.**

Price Four Guineas.

**PATENT SELF-REGISTERING LOGS.**

	£	s.	d.
Friend's ... ..	4	4	0
Walker's (Liverpool) ... ..	2	2	0
Walker's (Birmingham) ... ..	3	10	0
Massey's... ..	2	10	0
Tysen's... ..	5	5	0
Klinton (Swedish) ... ..	3	0	0
Reynold's ... ..	2	10	0

**PATENT SOUNDING MACHINES.**

	£	s.	d.
Friend's	4	4	0
Walker's (Liverpool)	2	2	0
Walker's (Birmingham)	3	5	0
Massey's	3	10	0
Reynold's	3	0	0

**LANTERNS, BELLS, FOG-HORNS, &c.**

Lamps for Sailing and Steam-vessels fitted up according to the New Regulations of the Board of Admiralty. These are of various sizes and patterns, and can be had either in tin (japanned) or in copper. Those with reflecting dioptric lenses are strongly recommended, as they give light of unusual brilliancy, and are but little more expensive.

Bells and Fog-Horns are kept in stock, as the Regulations oblige vessels to carry them for use in thick weather. They are of various sizes and prices.

**CHRONOMETERS.**

A large number of these Instruments is kept in stock and constantly rated. Purchasers may freely inspect the Rate Book; thus they have the opportunity of making such a selection as will give them confidence in the correct performance of the instrument. If not approved after a twelvemonth's trial, the Chronometer may be exchanged for another.

**CHRONOMETERS** re-sprung, re-adjusted, rated, bought, or exchanged.

Best Chronometers, going two days	... ..	from	£30	0	0
" " " eight days	... ..	from	35	0	0
" " for the Pocket, in gold cases	... ..	from	35	0	0

Second-hand **CHRONOMETERS** kept in stock, at various prices.

**Chronometers lent on hire.**

**WATCHES.**

The following is our List of Prices of Watches, which are all of superior quality, and particularly adapted for the use of seafaring persons;—

Patent Detached Lever Watch, capped and jewelled, in } silver cases ... ..	£5	0	0	to	£14	0	0
" " in gold cases ... ..	12	0	0	to	18	0	0
" " in silver hunting cases ... ..	10	0	0	to	15	0	0
" " in gold hunting cases ... ..	22	0	0	to	27	0	0
" * " Chronometer Balance ... ..	21	0	0	to	27	0	0

MESSRS. IMRAY AND SON

Beg leave to inform Owners and Shipmasters, that they are prepared to supply every description of INSTRUMENTS, CHART, or BOOK —ENGLISH or FOREIGN—which may be desired for Sea use or for Ship purposes. And they will undertake that they shall be of the best quality, which their long standing in the Trade, and their extensive connexion, enable them to offer on the most reasonable terms.





AGENTS FOR THE SALE

OF

**THE ADMIRALTY CHARTS**

AND

*Sailing Directions,*

**A LARGE ASSORTMENT OF WHICH CAN ALWAYS  
BE INSPECTED.**

Savill and Edwards, Printers, Chandos Street, Covent Garden.

