TREASURY DEPARTMENT

UNITED STATES COAST AND GEODETIC SURVEY

HENRY S. PRITCHETT

SUPERINTENDENT.

UNITED STATES COAST PILOT

ATLANTIC COAST.

PART VII.

From Chesapeake Bay Entrance to Key West.

SECOND EDITION.

PRICE 50 CENTS.

WASHINGTON
GOVERNMENT PRINTING OFFICE
1900.

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TREASURY DEPARTMENT.

UNITED STATES COAST AND GEODETIC SURVEY OFFICE,

WASHINGTON, D. C., *September 20, 1900.*

This volume covers the coast from Chesapeake Bay Entrance to Key West, including the harbors and navigable inland passages.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations carried on in connection with its preparation.

Much of the information relating to the Great Bahama Bank and Little Bahama Bank has been derived from charts and other publications of the United States Hydrographic Office and from the West India Coast Pilot, Vol. II, published by the British Admiralty.

The system adopted in this publication includes—

I. A tabular description of all lighthouses, light-vessels, and fog-signals; lists of life-saving stations, Weather Bureau wind-signal display stations, and seacoast telegraph stations; and information regarding tides, tidal currents, variation of the compass, etc.

II. General information concerning the several bodies of water and harbors, including notes relative to pilots and pilotage, towboats, depth of water, draft of vessels entering, harbor and quarantine regulations, supplies, facilities for making repairs, usual or best anchorages, and other matters of practical interest. In each case the information of this nature precedes the sailing directions and is printed in smaller type.

III. Sailing directions, with subordinate paragraphs treating of prominent objects, dangers, aids to navigation, etc. In the arrangement adopted the aim has been to conform, as far as practicable, to the order in which these matters would be considered in practice, and to render available such information as may be wanted promptly. For this purpose, and to afford a ready means of reference from one part to another, the sailing directions, where long, are divided into numbered or lettered sections, printed in large type, each followed by its own subordinate remarks in smaller type.

IV. Appendices.

The first edition of this publication was prepared by Lieut. Edwin H. Tillman, U. S. N., and Mr. John Ross. In the present (second) edition the text has been revised and brought up to date by Mr. John Ross, assisted by Mr. Harry L. Ford, under the general direction of Herbert G. Ogden, Assistant, Coast and Geodetic Survey, Inspector of Hydrography and Topography.

The aids to navigation are correct to September 20, 1900.

As absolute accuracy in a work of this class is scarcely possible, navigators will confer a favor by notifying the Superintendent of the Coast and Geodetic Survey of errors which they may discover, or of additional matter which they think, for the good of mariners, should be inserted.

HENRY S. PRITCHETT,
Superintendent.

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NOTE.

All bearings and courses are *magnetic*.
All distances are in *nautical miles*.
Except where otherwise stated, all depths are at *mean low water*.

SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

The following order is observed in coloring and numbering the buoys in United States waters, viz:

1. In approaching the channel, etc., from seaward, RED BUOYS, with EVEN NUMBERS, will be found on the STARBOARD side of the channel, and must be left on the STARBOARD hand in passing in.

2. In approaching the channel, etc., from seaward, BLACK BUOYS, with ODD NUMBERS, will be found on the PORT side of the channel, and must be left on the PORT hand in passing in.

3. BUOYS painted with RED and BLACK HORIZONTAL STRIPES will be found on OBSTRUCTIONS, with channel ways on either side of them, and may be left on either hand in passing in.

4. BUOYS painted with WHITE and BLACK PERPENDICULAR STRIPES will be found in MID-CHANNEL and must be passed close-to to avoid danger.

All other distinguishing marks to buoys will be in addition to the foregoing, and may be employed to mark particular spots, *a description of which is given in the printed list of buoys*.

Perches, with balls, cages, etc., will, when placed on buoys, be at turning points, the color and number indicating on what side they shall be passed.

Nun buoys, properly colored and numbered, are usually placed on the starboard side, and can buoys on the port side of channels.

Day beacons, stakes, and spindles (except such as are on the sides of channels, which will be colored like buoys) are constructed and distinguished with special reference to each locality, and particularly in regard to the background upon which they are projected.

Wherever practicable, the towers, beacons, buoys, spindles, and all other aids to navigation, are arranged in the buoy list in regular order *as they are passed by vessels entering from sea*.

The positions of the buoys enumerated in the list below are shown on the charts of the United States Coast and Geodetic Survey, which are kept corrected from information furnished by the Inspectors of the Lighthouse Districts, for the changes in the aids to navigation rendered necessary from time to time to indicate the best channels.

The following symbols and abbreviations are used on the charts of the Coast and Geodetic Survey:

◊ Red buoys, with even numbers, to be left on starboard hand in entering.

♦ Black buoys, with odd numbers, to be left on the port hand in entering.

◊ Black and white perpendicular stripes, without numbers, mid-channel or fairway buoys.

◊ or H. S., red and black horizontal stripes, without numbers, marking dangers or obstructions, to be left on either hand.

◊ Lighted buoys, different colors as above; R., red light; W., white light.

◊ ***WHISTLE,*** whistling buoys, different colors as above.

◊ ***BELL,*** bell buoys, different colors as above.

C., N., or S. signifies can, nun, or spar buoy.

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TREASURY DEPARTMENT

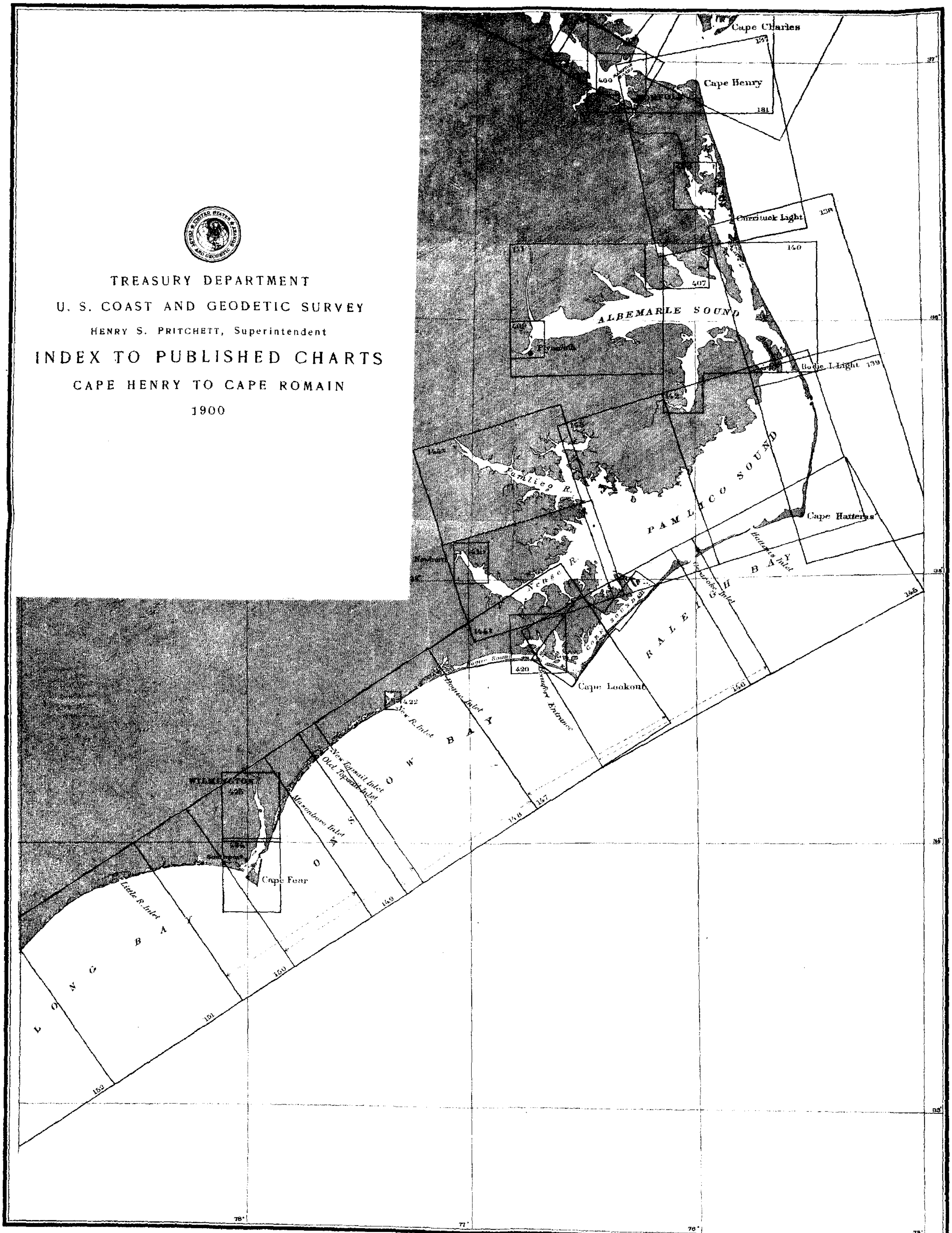
U. S. COAST AND GEODETIC SURVEY

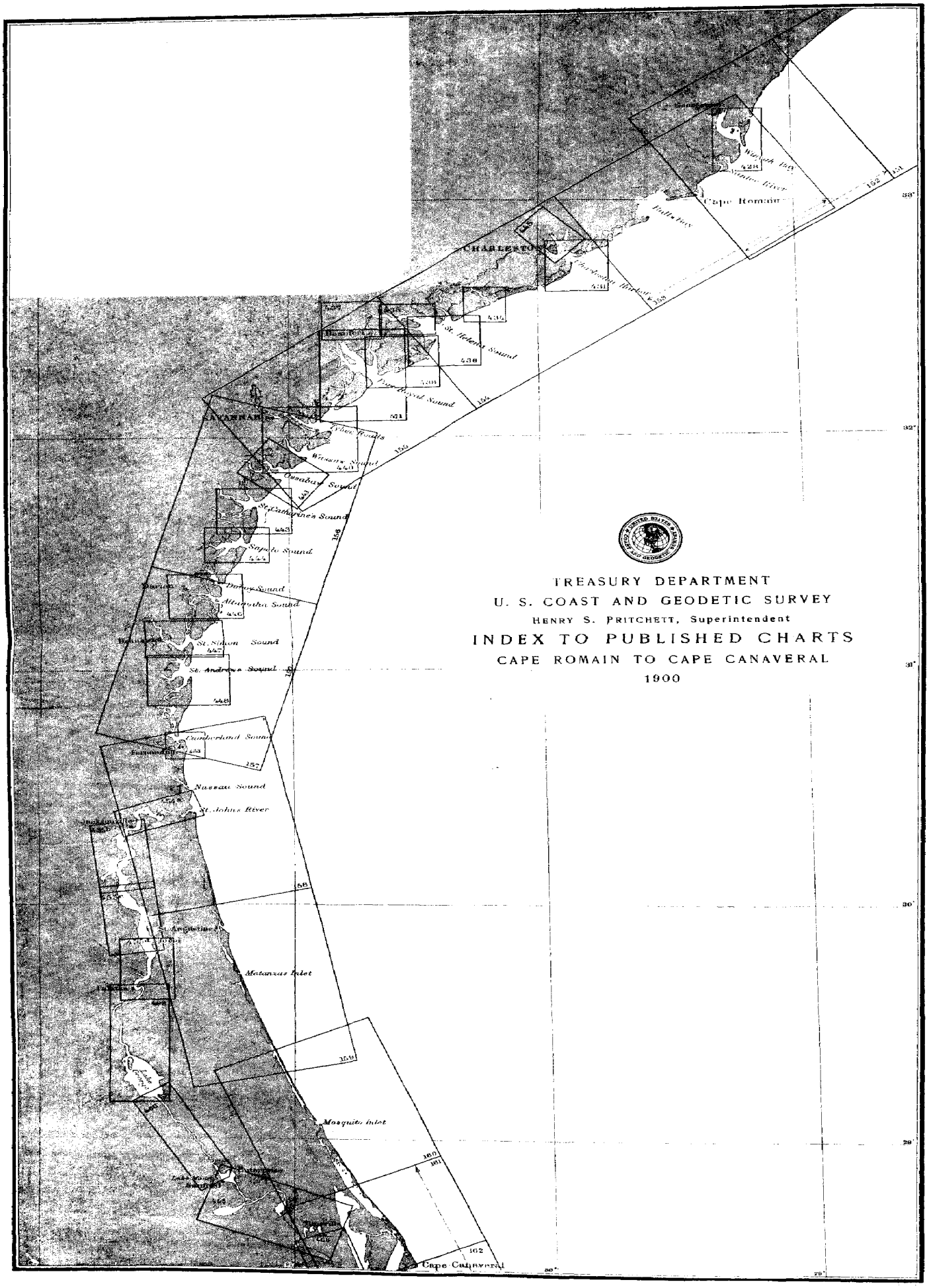
HENRY S. PRITCHETT, Superintendent

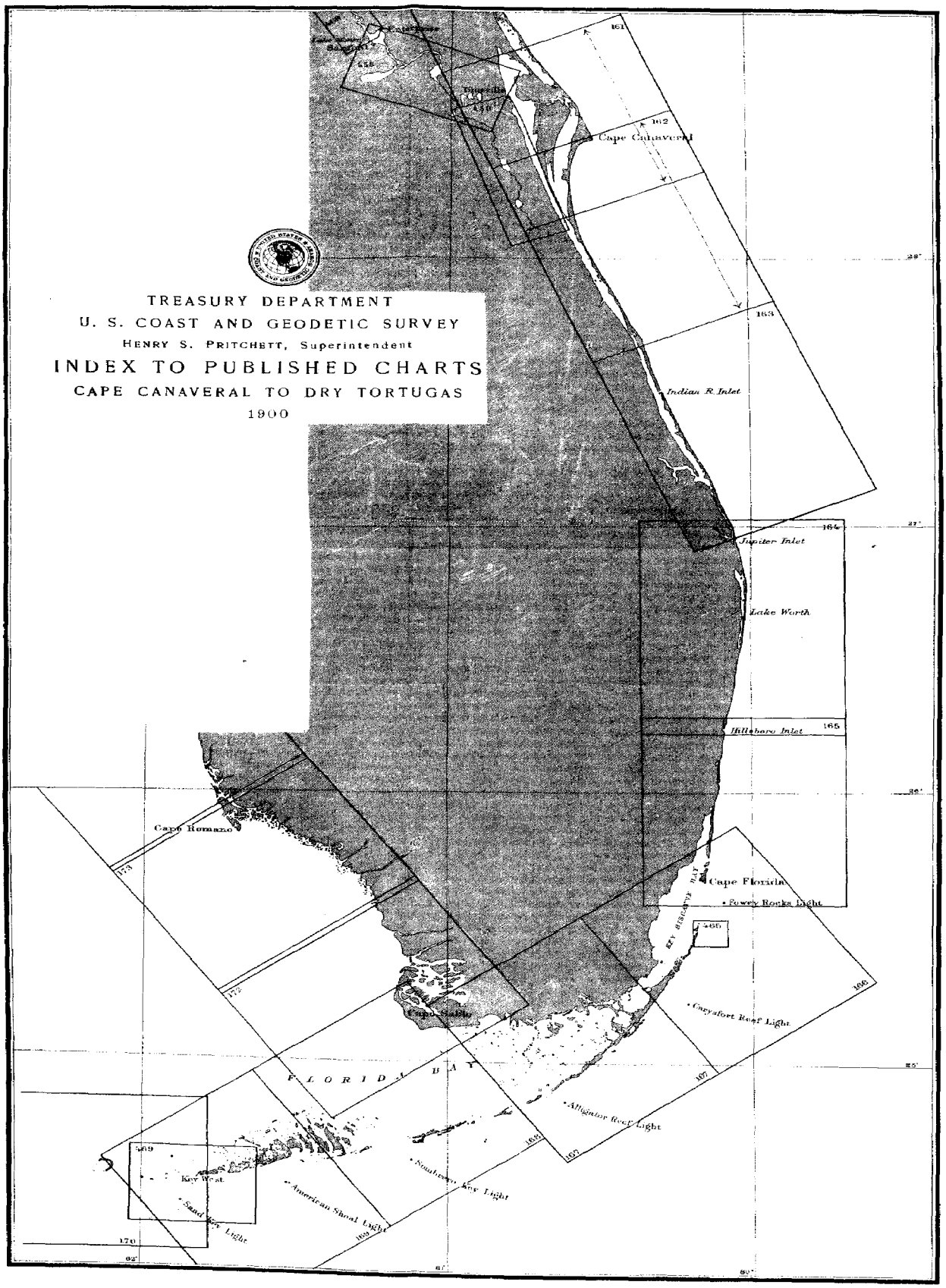
INDEX TO PUBLISHED CHARTS

CAPE HENRY TO CAPE ROMAIN

1900




TREASURY DEPARTMENT
U. S. COAST AND GEODETIC SURVEY
HENRY S. PRITCHETT, Superintendent
INDEX TO PUBLISHED CHARTS
CAPE ROMAIN TO CAPE CANAVERAL
1900
Cape Romain
CHARLESTON
Wando River
Cooper River
Ashley River
Folly River
Charleston Harbor
St. Helena Sound
Port Royal Sound
SAVANNAH
Tybee Roads
Wassaw Sound
Ossabaw Sound
St. Catherines Sound
Sapelo Sound
Doboy Sound
Altamaha Sound
St. Simon Sound
St. Andrews Sound
Cumberland Sound
Nassau Sound
St. Johns River
Matanzas Inlet
Mosquito Inlet
Cape Canaveral
152
154
156
158
160
161
162
38°
32°
31°
30°
29°
28°


TREASURY DEPARTMENT
U. S. COAST AND GEODETIC SURVEY
HENRY S. PRITCHETT, Superintendent
INDEX TO PUBLISHED CHARTS
CAPE CANAVERAL TO DRY TORTUGAS
1900
Cape Canaveral
Indian R Inlet
Jupiter Inlet
Lake Worth
Hillsboro Inlet
Cape Romano
Cape Florida
Fowey Rocks Light
Carysfort Reef Light
Alligator Reef Light
Sombrero Key Light
American Shoal Light
Sand Key Light
Key West
FLORIDA BAY
161
162
163
164
165
166
167
168
169
170
172
173
28°
27°
26°
25°
82°
81°
80°

AGENCIES ON THE ATLANTIC AND GULF COASTS FOR THE SALE OF THE CHARTS, COAST PILOTS, AND TIDE TABLES OF THE UNITED STATES COAST AND GEODETIC SURVEY.

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BRUNSWICK, GA.
C. W. DEMING, Custom-House.

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JACKSONVILLE, FLA.
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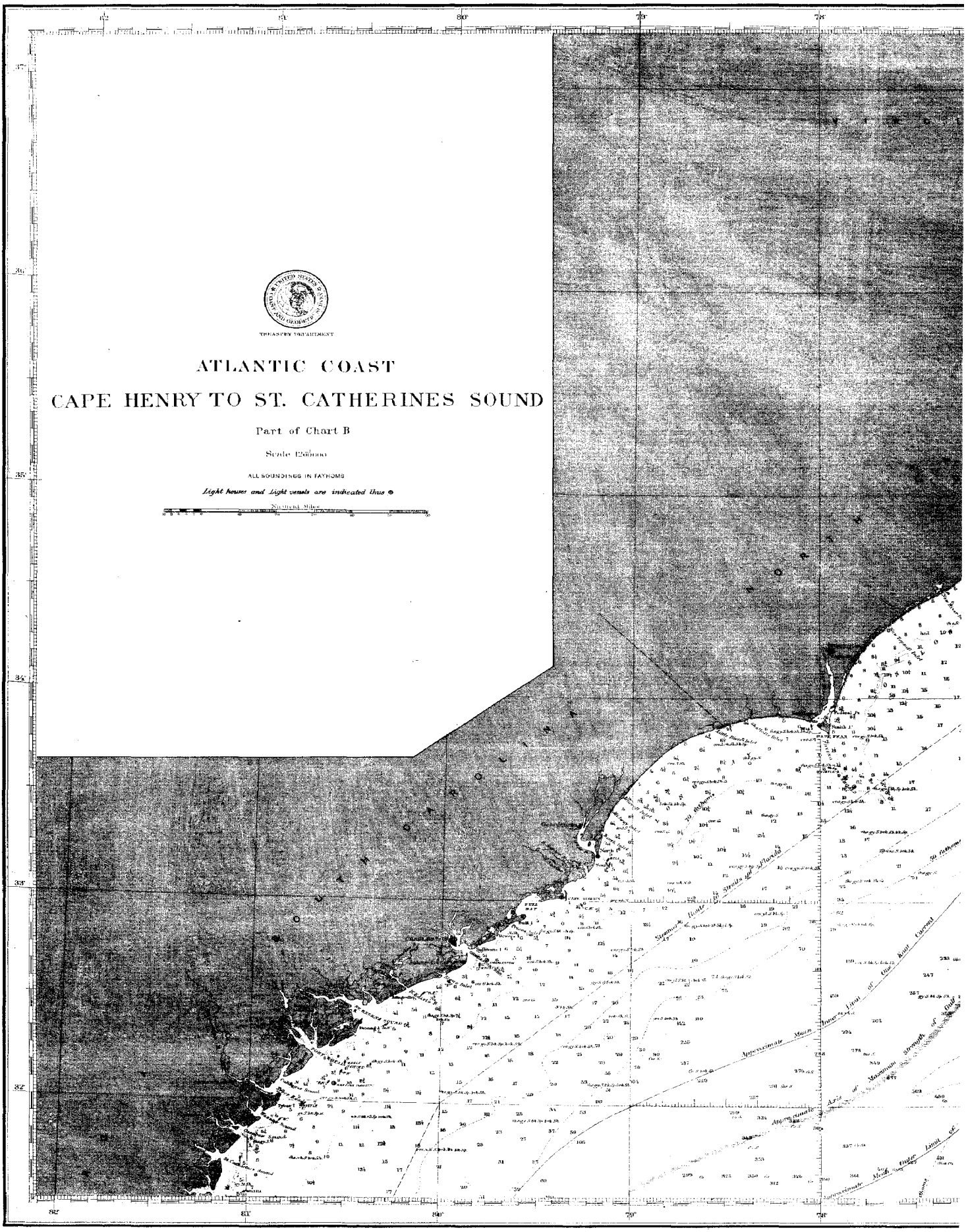
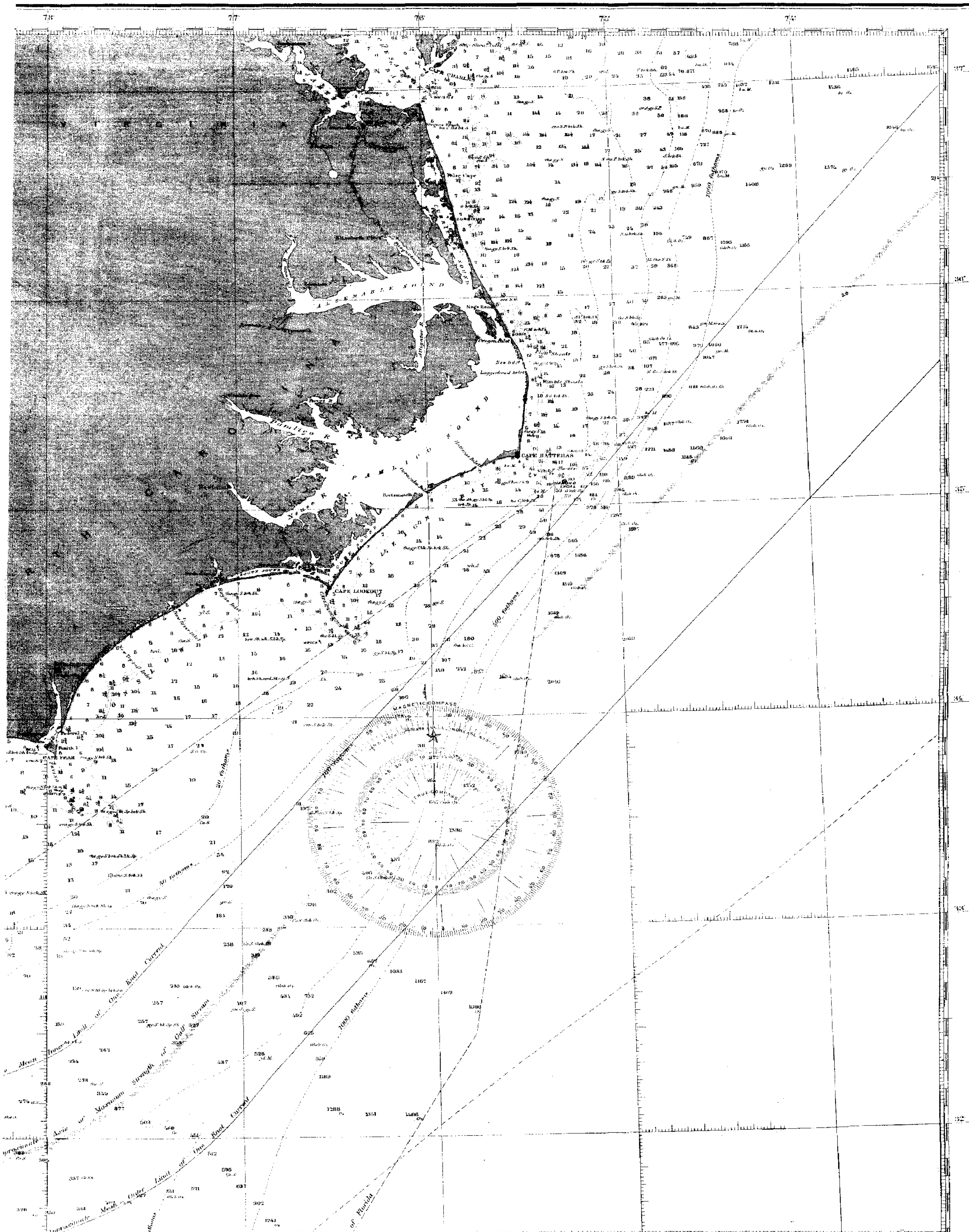

TREASURY DEPARTMENT
ATLANTIC COAST
CAPE HENRY TO ST. CATHERINES SOUND
Part of Chart B
Scale 1/200000
ALL SOUNDINGS IN FATHOMS
Light houses and Light vessels are indicated thus
Nautical Miles
Approximate Mean Inner Limit of Gulf Stream Current
Approximate Axis of Maximum Strength of Gulf Stream
Approximate Mean Outer Limit of Gulf Stream
Stream Route to Straits of Florida
CAPE HENRY
CAPE HATTERAS
82°
81°
80°
79°
78°
37°
36°
35°
34°
33°
32°



78°
77°
76°
75°
74°
37°
36°
35°
34°
33°
32°
ALBEMARLE SOUND
PAMLICO SOUND
CAPE HATTERAS
CAPE LOOKOUT
CAPE FEAR
Oregon Inlet
Portsmouth
MAGNETIC COMPASS
TRUE COURSES
100 fathoms
500 fathoms
1000 fathoms
20 fathoms
50 fathoms
Mean Inner Limit of One Knot Current
Axis of Maximum Strength of Gulf Stream
Mean Outer Limit of One Knot Current

The following addenda include the changes which occurred while this volume was going through the press:

Pages 24 and 115.

Hawk Channel.—Long Key Shoal beacon was carried away in a gale. Long Key Shoal buoy (red, No. 12) remains in position and marks the shoal.

Hen and Chickens Shoal beacon (lighted) was carried away in a gale. A red nun buoy will be placed to mark the shoal.

Page 38.

A red can buoy has been placed ½ mile **NNW.** from Diamond Shoal Light-vessel, as a mark buoy.

Page 39.

Frying Pan Shoals.—The buoys marking the Slue Channel have been removed.

Page 68.

Coast from Cape Fear to St. Johns River Entrance.—(Fifteenth line.) "New River Inlet" should read "Little River Inlet."

Page 115.

Hawk Channel.—Tavernier Key beacon will hereafter be known as Triangles beacon.

Pages 119 and 120.

Bahia Honda Harbor.—The red beacon on the point of the shoal at the east side of the harbor entrance was carried away in a gale. Red buoy, No. 2, now marks the point of the shoal.

Page 126.

Boca Grande Channel.—Bar buoy (black, No. 1) has been placed near the north entrance to the channel; this buoy is left on the port hand when steering about **S.** Halfway buoy (red, No. 2) has replaced the mid-channel buoy and should be left on the starboard hand when steering about **S. ¼ E.**

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART VII.

FROM CHESAPEAKE BAY ENTRANCE TO KEY WEST.*

GENERAL REMARKS.

This volume, Part VII of the "United States Coast Pilot, Atlantic Coast," covers the coast from Chesapeake Entrance to Key West, Florida, a distance measured along the coast of over 1,000 miles.

From Chesapeake Entrance to Cape Florida the general character of the coast is low and sandy, backed by woods, the highest land (63 feet) near the coast being Mount Cornelia, just northward of the entrance to St. Johns River. The harbors on this stretch of coast all lie between Cape Fear, in latitude 33° 52′ N., and St. Augustine, in latitude 29° 52′ N., the stretch northward being broken only by a number of unimportant inlets.

From Cape Florida to Key West the coast may be considered as being formed by a long chain of small islands known as Florida Keys (see description), off and extending nearly parallel to which are the Florida Reefs (see description). There are no harbors along this stretch of coast except Key West, but there are a few anchorages among the keys and reefs.

From Cape Henry to Cape Hatteras the shore has a general **S.** by **E.** trend, and from Cape Hatteras to Tybee Roads the general trend is about **SW.** by **W.** ½ **W.** Between Cape Hatteras and Cape Romain there are three distinct curves in the shore, forming broad bights, which are separated from each other by Cape Lookout and Cape Fear, and the extensive shoals which make off from these capes.

Between Winyah Bay and the St. Johns River the shore is very broken, the harbors, inlets, and sounds being in many cases but little over 10 miles apart. The most important harbors, named in order from northward, are: Charleston Harbor, Port Royal Sound, Tybee Roads, Altamaha Sound, St. Simons Sound, Cumberland Sound, and St. Johns River. These, like all the harbors south of Hatteras, have at their entrances shifting bars which, in some cases, extend from 5 to 8 miles from the shore.

From Tybee Roads the shore curves gradually southward to the mouth of St. Johns River; thence to Cape Canaveral its general trend is about **SSE.** From Cape Canaveral to Jupiter Inlet the coast has a general trend of about **S.** by **E.** ½ **E.** and thence to Fowey Rocks about **S.** ¼ **W.**; from here the Florida Reefs extend for about 134 miles in a southwesterly curve to Sand Key Lighthouse and about 40 miles in a westerly direction to Rebecca Shoal, which may be considered as the westernmost of the reefs.

South of latitude 27° 24′ N., and lying at a least distance of 42 miles eastward of the coast of Florida, are Great and Little Bahama banks and the Bahama Islands; and southward of the Florida Reefs, and at a least distance of 78 miles, is the Island of Cuba. North and west of these islands and skirting the coast of Florida are the Straits of Florida, through which flow the waters of the Gulf Stream; the Straits, in connection with the channels between the islands, form the northern approach and entrance to the Gulf of Mexico.

Cape Hatteras, Cape Lookout, Cape Fear, and Cape Canaveral are distinguished for the distance to which dangerous shoals extend seaward from them; these shoals are generally sand, shifting to some extent with every heavy gale, and, with the strong tidal currents which usually set across them, they form the greatest dangers for the navigator while passing along this coast.

Only the general features of the coast are mentioned above; descriptions and more detailed information pertaining to the coast, harbors, and dangers are given under separate headings.

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*Shown on the following Coast and Geodetic Survey charts: **B, C,** Sailing Charts, scale $\frac{1}{1,200,000}$, price of each $0.50; **10, 11, 12, 13, 14, 15,** General Charts of the coast, scale $\frac{1}{400,000}$, price of each $0.50; **137** to **169**, both inclusive, scale $\frac{1}{80,000}$, price of each $0.50; and a number of harbor charts, on a larger scale, as noted under the several headings; all charts referred to in footnotes are issued by the Coast and Geodetic Survey.

Coast and Geodetic Survey charts can be obtained from the agents named in the list given on pages 7 and 8. Facing page 7 are index maps, showing the location and limits of charts covering that part of the coast included in this volume. The catalogue of charts and other publications of the Survey also contain similar index maps; copies of this catalogue can be obtained free of charge on personal application at any of the sale agencies or by letter addressed to the Coast and Geodetic Survey Office, Washington, D. C.

Fogs occur more frequently off Cape Hatteras and the coast northward than farther south; the most fog usually occurs during the early spring months. Along the coast from Cape Hatteras to St. Augustine fog seldom occurs except in February and March, while south of St. Augustine it is of very rare occurrence. In the fall and winter the Gulf Stream is frequently marked by a thick haze or vapor, which sometimes closely approaches the shoals of Cape Hatteras, and is usually an intimation of a close approach to the Gulf Stream.

Aids to Navigation.—The principal capes and harbor entrances are marked by lighthouses, and most of the important outlying shoals by light-vessels or buoys. The buoys at the harbor entrances are frequently moved so as to indicate the navigable channels, this being necessary owing to the shifting bars which obstruct the entrances. The buoyage accords with the system adopted for United States waters. (See page 5, and also the table of lighthouses on pages 12–29.)

Pilots.—There are licensed pilots at all the ports along this coast, and by the laws of the States bordering on the coast pilotage is made compulsory for nearly all vessels. Pilots will be found cruising outside of some of the ports, while at others they keep a constant lookout for vessels making the pilot signal outside the bar. (For pilot laws and pilotage rates see Appendix I.)

Quarantine.—The quarantine laws of the different States govern the ports of their respective States. The National Quarantine Station in Sapelo Sound has all the appliances for the disinfection of vessels. (See "Quarantine," Appendix I and Appendix IV.)

U. S. Marine-Hospital Service.—There is a marine hospital at Wilmington, N. C., and one at Key West, Florida. (See Appendix IV.)

TIDES.*

GENERAL TABLE.

Locality.	Lunitidal interval or corrected establishment.	Mean Rise and Fall.			Mean Duration of—	
		Mean tides.	Spring tides.	Neap tides.	Rise.	Fall.
	h. m.	Feet.	Feet.	Feet.	h. m.	h. m.
On Hatteras Shoals	7 00	1.9	2.1	1.7	6 13	6 12
Hatteras Inlet	7 04	2.0	2.4	1.6	6 13	6 12
Bogue Inlet	7 22	3.4	3.7	3.1	6 12	6 13
Cape Fear River Entrance	7 26	4.3	5.0	3.5	6 12	6 13
Winyah Bay Entrance	7 43	3.5	4.1	2.8	6 04	6 21
Charleston Entrance	7 10	5.4	6.4	4.4	6 23	6 02
Port Royal Sound Entrance	7 12	6.3	7.4	5.1	6 07	6 18
Tybee Roads	7 10	6.8	7.9	5.5	6 06	6 19
St. Catherines Sound Entrance	7 37	7.3	8.5	5.9	6 04	6 21
Doboy Sound Entrance	7 30	7.2	8.4	5.8	6 06	6 19
St. Simon Sound Entrance	7 43	6.8	8.0	5.5	6 03	6 22
St. Andrew Sound Entrance	7 41	6.8	8.0	5.5	6 03	6 22
Fernandina, Fort Clinch	7 39	5.9	6.9	4.8	6 08	6 17
St. Johns River Entrance	7 36	4.6	5.4	3.7	6 03	6 22
St. Augustine Inlet	8 21	4.2	5.0	3.4	6 10	6 15
At Cape Canaveral	8 00	5.0	5.9	4.0	6 08	6 17
Jupiter Inlet	8 00	1.5	1.8	1.2	6 00	6 25
Cape Florida Anchorage	8 24	1.7	2.2	1.1	5 55	6 30
Turtle Harbor, Florida Reefs	7 47	2.3	2.5	2.1	6 07	6 18
Key West Harbor	8 58	1.2	1.6	0.8	6 12	6 13
Tortugas	9 44	1.1	1.4	0.7	6 22	6 03

*Tide Tables for the Atlantic Coast, published annually, after 1900, by the United States Coast and Geodetic Survey, predicting the times and heights of tides for every day of the year, at all the principal ports, can be obtained from the agents named in the list given on pages 7 and 8; price, $0.15.

STORM-WARNING DISPLAY STATIONS AND SEACOAST TELEGRAPH STATIONS.

The Storm-Warning Displays of the United States Weather Bureau are made for the benefit of mariners at the following stations. The signals are described and their meaning is explained in Appendix II.

Cape Henry, Va.*
Hatteras, N. C.
Elizabeth City, N. C.
Edenton, N. C.
Washington, N. C.
Newbern, N. C.
Cape Lookout, N. C.
Beaufort, N. C.
Morehead City, N. C.
Wilmington, N. C.
Southport, N. C.
Oak Island, N. C.
Georgetown, S. C.
Charleston, S. C.
Port Royal, S. C.
Savannah, Ga.
Tybee Island, Ga.
Thunderbolt, Ga.
Isle of Hope, Ga.
St. Simon Lighthouse, Ga.
Brunswick, Ga.
Fernandina, Fla.
Fort George Island, Fla.
Jacksonville, Fla.
St. Augustine, Fla.
Jupiter, Fla.*
West Palm Beach, Fla.
Cape Florida, Fla.
Miami, Fla.
Key West, Fla.

* This station is equipped with the International Code Signals, for communicating with passing vessels. To be reported, vessels should display their signal letters on passing the station.

UNITED STATES LIFE-SAVING STATIONS.

The following list of life-saving stations has been corrected to July, 1900. The geographical positions given are approximate and are taken from the Official Register of the service. These stations are furnished with lifeboats, mortars, and all other appliances for affording assistance in cases of shipwreck.*

Name of Station.	State.	Locality.†	Approximate Position.					
			Latitude, north.			Longitude, west.		
			°	′	″	°	′	″
Cape Henry	Va	¾ mile SE. from lighthouse	36	55	10	75	59	50
Seatack	Va	5½ miles S. of Cape Henry Light	36	51	10	75	58	40
Dam Neck Mills	Va	10 miles S. of Cape Henry Light	36	47	10	75	57	30
Little Island	Va	On beach abreast North Bay	36	41	30	75	55	20
False Cape	Va	On beach abreast Back Bay	36	36	00	75	52	50
Wash Woods	N. C	On beach abreast Knotts Island	36	32	00	75	52	10
Currituck Inlet	N. C	5¾ miles N. of Currituck Beach Light	36	27	30	75	50	40
Whales Head	N. C	¾ mile N. of Currituck Beach Light	36	23	20	75	49	40
Poyners Hill	N. C	6½ miles S. of Currituck Beach Light	36	17	10	75	48	00
Caffeys Inlet	N. C	10¾ miles S. of Currituck Beach Light	36	13	40	75	46	20
Paul Gamiels Hill	N. C	5 miles N. of Kitty Hawk	36	08	00	75	43	50
Kitty Hawk	N. C	On beach abreast N. end of Kitty Hawk Bay	36	03	50	75	41	30
Kill Devil Hills	N. C	4½ miles S. of Kitty Hawk	36	00	10	75	39	40
Nags Head	N. C	9 miles N. of Oregon Inlet	35	56	00	75	36	40
Bodie Island	N. C	⅜ mile NE. of Bodie Island Light	35	49	40	75	33	20
Oregon Inlet	N. C	½ mile S. of Oregon Inlet	35	47	30	75	32	10
Pea Island	N. C	2 miles N. of New Inlet	35	43	15	75	29	30
New Inlet	N. C	½ mile S. of New Inlet	35	40	40	75	29	00
Chicamicomico	N. C	5 miles S. of New Inlet	35	36	40	75	27	50
Gull Shoal	N. C	11¾ miles S. of New Inlet	35	29	50	75	28	40
Little Kinnakeet	N. C	11½ miles N. of Cape Hatteras Light	35	25	00	75	29	10
Big Kinnakeet	N. C	5½ miles N. of Cape Hatteras Light	35	20	00	75	30	20
Cape Hatteras	N. C	1 mile S. of the lighthouse	35	14	20	75	31	20
Creeds Hill	N. C	4 miles W. of Cape Hatteras Light	35	14	30	75	35	15
Durants	N. C	3 miles E. of Hatteras Inlet	35	12	35	75	41	10
Ocracoke	N. C	1½ miles W. of Hatteras Inlet	35	11	00	75	46	10
Portsmouth	N. C	Northeast end of Portsmouth Island	35	04	00	76	03	05
Core Bank	N. C	Halfway between Ocracoke Inlet and Cape Lookout.	34	51	30	76	18	30
Cape Lookout	N. C	1½ miles S. of the lighthouse	34	36	30	76	32	20
Cape Fear	N. C	On Smith Island, Cape Fear	33	50	30	77	57	20
Oak Island	N. C	W. side mouth of Cape Fear River	33	53	20	78	01	20
Sullivans Island	S. C	At Moultrieville, at N. end of harbor jetty	32	45	30	79	51	05
Smiths Creek ‡	Fla	20 miles S. of Matanzas Inlet	29	26	10	81	06	15
Mosquito Lagoon ‡	Fla	On beach outside the lagoon	28	51	30	80	46	20
Chester Shoal ‡	Fla	11 miles N. of Cape Canaveral	28	36	40	80	35	50
Bethel Creek ‡	Fla	11 miles N. of Indian River Inlet	27	40	00	80	21	20
Indian River Inlet ‡	Fla	S. side of inlet	27	29	45	80	17	50
Gilberts Bar ‡	Fla	St. Lucie Rocks, 2 miles N. of Gilberts Bar Inlet	27	12	00	80	09	50
Jupiter Inlet	Fla	S. side of inlet	26	55	40	80	04	00
Orange Grove ‡	Fla	5½ miles S. of Lake Worth, 37 miles S. of Jupiter Inlet.	26	27	30	80	03	20
Fort Lauderdale ‡	Fla	4 miles N. of New River Inlet	26	08	00	80	06	00
Biscayne Bay ‡	Fla	6 miles N. of Norris Cut	25	54	10	80	08	00

* Instructions to enable mariners to avail themselves fully of the assistance thus afforded will be sent free of charge upon application to the General Superintendent of the Life-Saving Service, Washington, D. C.

† The distances in this column are evidently statute miles measured along the beach.

‡ House of refuge. No crew employed.

TABLE OF LIGHTS.

Lighthouse Districts, Etc.—The coast and the waters covered by this volume lie within the **Fifth, Sixth, and Seventh Lighthouse Districts** of the United States. These districts extend from Metomkin Inlet, Virginia, including Chesapeake Bay and the inland waterways and coast to the Perdido River, Florida. The Light list for the seacoasts of the United States and the Buoy lists for the Fifth, Sixth, and Seventh Districts give full descriptions of the aids to navigation.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
1	CAPE HENRY	36 55 35 76 00 27	Fixed white, with a fixed red sector between SW. by W. and SSE.	1	157	18¾
2	CURRITUCK BEACH	36 22 36 75 49 51	Fixed white, varied by a red flash every 90 seconds.	1	158	18¾
3	BODIE ISLAND	35 49 07 75 33 49	Fixed white	1	156	18½
4	CAPE HATTERAS	35 15 17 75 31 16	Flashing white every 10 seconds	1	191	20
5	Cape Hatteras Beacon	35 14 (26) 75 31 (16)	Fixed white	Lens lantern.	27	10¼
6	*Diamond Shoal Light-Vessel, No. 69 or 71*	35 06 (05) 75 16 (44)	Two fixed white 12 seconds, eclipse 3 seconds; three lanterns encircling each masthead; electric. If the electric light apparatus should become inoperative, the lights will show fixed white *without eclipses* and will be *less brilliant* than the electric lights.	Lens lantern.	{57 57}	13
7	OCRACOKE	35 06 32 75 59 11	Fixed white	4	75	14¼
8	CAPE LOOKOUT	34 37 22 76 31 29	Fixed white	1	156	18½
9	Wreck Point Beacon					
10	NORTH LANDING RIVER. Beacon Light No. 1	36 35 (36) 76 03 (37)	Fixed white	Lens lantern.	20	8¾
11	NORTH LANDING RIVER. Beacon Light No. 2	36 35 (30) 76 02 (59)	Fixed white	Lens lantern.	20	8¾
12	NORTH LANDING RIVER. Beacon Light No. 3	36 33 (21) 76 01 (52)	Fixed white	Lens lantern.	20	8¾
13	NORTH LANDING RIVER. Beacon Light No. 4	36 32 (03) 76 01 (19)	Fixed white	Lens lantern.	20	8¾
14	CURRITUCK SOUND. Beacon Light No. 5	36 28 (40) 76 00 (08)	Fixed white	Lens lantern.	20	8¾
15	CURRITUCK SOUND. Beacon Light No. 6	36 26 (59) 75 57 (55)	Fixed white	Lens lantern.	20	8¾
16	CURRITUCK SOUND. Beacon Light No. 7	36 25 (00) 75 57 (13)	Fixed white	Lens lantern.	20	8¾
17	CURRITUCK SOUND. Beacon Light No. 8 (Long Point)	36 23 (52) 75 57 (21)	Fixed white	Lens lantern.	26	8¾
18	CURRITUCK SOUND. Coanjock Bay Beacon Light		Fixed white	Lens lantern.	20	
19	Beacon Light No. 9	36 12 (48) 75 58 (15)	Fixed white	Lens lantern.	20	8¾
20	Beacon Light No. 10	36 15 (24) 75 57 (27)	Fixed white	Lens lantern.	20	8¾
21	ALBEMARLE SOUND. Range. North River Bar (front)		Fixed white	Lens lantern.	19	
22	ALBEMARLE SOUND. Range. North River Bar (rear)		Fixed white	Lens lantern.	35	
23	ALBEMARLE SOUND. North River	36 09 (21) 75 53 (48)	Fixed red	5	35	8½
24	ALBEMARLE SOUND. Wade Point	36 09 (12) 75 58 (38)	Fixed white	4	39	11½
25	ALBEMARLE SOUND. Reeds Point Beacon	36 04 (40) 76 12 (52)	Fixed white	Lantern.	16	
26	ALBEMARLE SOUND. Laurel Point	36 00 (15) 76 23 (30)	Flashing white every 30 seconds	4	42	11¾

CAPE HENRY TO DRY TORTUGAS.

These pamphlets, which are corrected and reprinted from time to time, are sent free of charge to any shipmaster on application to the office of the Lighthouse Board, Washington, D. C., or to the Inspector of the Fifth Lighthouse District, Baltimore, Md., the Inspector of the Sixth Lighthouse District, Charleston, S. C., and Inspector of the Seventh Lighthouse District, Key West, Fla. They can also be had on application at the United States Branch Hydrographic Offices at Baltimore, Norfolk, and Savannah.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
1	Octagonal tower; base, service room, and lantern, black; shaft colored on each face, half white and half black, alternating, so that upper and lower halves of faces show alternately black and white. Dwellings and fog-signal house near. Old tower SW. by W. 340 feet.	152	1st-class steam siren; blasts 5 seconds, silent intervals 90 seconds.
2	Conical red tower; lantern, black. Dwelling detached and in rear. To the N. and S. of tower are high white sand hills; no other prominent objects in the vicinity.	150	
3	Conical brick tower; granite base. Shaft colored in alternate black and white bands, commencing with white below; lantern and ironwork black. White dwelling, 150 feet to westward.	150	
4	Tower colored in spiral bands, alternately black and white; lantern, black	189	
5	Brown post		
6	Flush deck, steam light-vessel; two masts schooner-rigged, no bowsprit. Circular gallery under the lens lanterns at each masthead. Hull red, with "DIAMOND SHOAL" in white on each side and "69" in white on each bow. A black smokestack and the fog signal between the masts.		12-inch steam chime whistle; blasts 5 seconds; silent intervals 55 seconds. If whistle be disabled a bell will be rung by hand.
	Tower and detached dwelling, white; lantern, black	65	
	Tower, colored in black and white diagonal checkers; lantern, black; detached dwelling.	150	
9	To be established		
10	Lantern on black iron column		
11	Lantern on red iron column		
12	Lantern on black iron column		
13	Lantern on red iron column		
14	Lantern on red iron column		
15	Lantern on red iron column		
16	Lantern on black iron column		
17	Lantern on end of brown boathouse (new structure to be erected)		
18	Lantern on red iron column		
19	Lantern on black iron column		
20	Lantern on red iron column		
21	Black iron column surrounded by a triangular protection of piles		
22	White, triangular iron structure		
23	White, square screw-pile structure; piles, brown; lantern, black		Bell struck by machinery every 5 seconds.
24	White, square screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery, a double blow, every 20 seconds.
25	Red iron column surrounded by a triangular protection of piles		
26	White, hexagonal screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 10 seconds.

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
			° ′ ″				
27	Albemarle Sd—Con. Range.	Edenton Harbor (front)	36 03 (24) 76 36 (36)	Fixed red	Lens lantern.	8	
28		Edenton Harbor (rear)		Fixed red	Lens lantern.	30	
29		Roanoke River	35 57 02 76 41 40	Fixed white	4	35	11
30		Alligator River Beacon	35 56 (56) 75 59 (45)	Fixed white	Lantern.	16	
31		Croatan	35 56 (46) 75 46 (50)	Fixed white, with a fixed red sector between W. ⅞ N. and NW. ⅜ N.	4	40	11½
32		Blockade Shoal Beacon	35 54 (00) 75 43 (17)	Fixed white	Lantern	16	
33		Roanoke Marshes	35 48 (41) 75 42 (05)	Fixed white, with a fixed red sector between S. ⅞ E. and S. ½ E.	4	37	11¼
34	Pamlico Sound.	Long Shoal	35 33 23 75 42 16	Fixed white	4	35	11
35		Hatteras Inlet	35 15 48 75 45 38	Flashing red every 20 seconds	4	38	11½
36		Gull Shoal	35 22 (02) 75 57 (30)	Fixed red	4	43½	11¼
37		Ocracoke	35 06 32 75 59 11	Fixed white	4	75	14¼
38		Southwest Point Royal Shoal	35 07 (07) 76 08 (35)	Fixed white	5	35	11
39		Northwest Point Royal Shoal	35 09 19 76 09 30	Fixed red	Lens lantern.	33	7
40		Harbor Island Bar	35 00 (22) 76 13 (18)	Flashing red every 10 seconds	5	40	11½
41		Brant Island Shoal	35 08 (10) 76 17 (37)	Fixed white	5	35	11
42		Pamlico Point	35 18 (40) 76 27 (03)	Fixed white	4	43½	11¾
43	Pungo River.	Pungo River Beacon	35 22 (41) 76 33 (45)	Fixed white	Post lantern.	12	
44		Woodstock Point Beacon					
45		Pantego Creek Beacon					
46	Pamlico River.	Rumley Marsh Beacon					
47		Mauls Point Beacon					
48		Fork Point Beacon					
49		McWilliams Point Shoal		Fixed red	Post lantern.	10	
50		Rodman Point Shoal		Fixed white	Post lantern.	10	
51		Windmill Point Shoal		Fixed red	Post lantern.	10	
52	Neuse River.	Point of Marsh Beacon					
53		Neuse River	35 05 20 76 32 56	Fixed white	5	35	11¼
54		Wilkinson Point Shoal Beacon		Fixed white	Lantern.	11	
55		Otter Creek Beacon		Fixed white	Lantern.	11	
56		Johnson Point Beacon	35 02 (41) 76 59 (07)	Fixed white	Lantern.	14	
57		Lower Green Spring Beacon	35 04 (49) 77 00 (58)	Fixed white	Lantern.	14	
58		Upper Green Spring Beacon	35 05 (23) 77 01 (56)	Fixed white	Lantern.	14	

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
27	Lantern hung on an iron post		
28	Lantern hung on a mast		
29	White, square screw-pile structure; piles, brown; lantern, black; shingle roof, brown.		Bell struck by machinery every 15 seconds.
30	Red, iron column, surmounted by the lantern and surrounded by a triangular protection of piles.		
31	White, square screw-pile structure with green shutters; piles and roof, brown; lantern, black. Fog bell on W. side of roof.		Bell struck by machinery every 15 seconds.
32	Black iron column surmounted by the lantern and surrounded by a triangular protection of piles.		
33	White, square screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 12 seconds.
34	White, square screw-pile structure; shingle roof, dark red; piles, brown; lantern, black.		Bell struck by machinery at alternate intervals of 5 and 30 seconds.
35	White, square screw-pile structure; piles and roof, brown; lantern black		Bell struck by machinery every 8 seconds.
36	White, hexagonal screw-pile structure; piles and roof, brown; blinds, green; lantern, black.		Bell struck by machinery, a double blow, every 15 seconds.
37	Tower and detached dwelling, white; lantern, black	65	
38	White, square screw-pile structure; piles and roof, brown; lantern, black		
39	White, hexagonal screw-pile structure; piles and roof, brown; roof of lantern, black.		
40	White, square screw-pile structure, with green shutters; piles and roof, brown; lantern, black.		Bell struck by machinery every 10 seconds.
41	White, square screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 20 seconds.
42	White, hexagonal screw-pile structure; piles and roof, brown; blinds, green; lantern, black.		Bell struck by machinery every 10 seconds.
43	Red and black horizontally striped four-pile structure		
44	To be established		
45	To be established		
46	To be established		
47	To be established		
48	To be established		
49	Red pile		
50	Black pile		
51	Red pile		
52	To be established		
53	White, square screw-pile structure; piles and roof, brown; lantern, black		Bell struck by machinery every 15 seconds.
54	Square, red pyramidal skeleton of four piles		
55	Square, red pyramidal skeleton of four piles		
56	Triangular black pyramidal skeleton of three piles, with an independent central pile carrying the lantern.		
57	Triangular black pyramidal skeleton of three piles, with an independent central pile carrying the lantern.		
58	Triangular red pyramidal skeleton of three piles, with an independent central pile carrying the lantern.		

TABLE OF LIGHTS—Continued.

Number.		Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
			° ′ ″				
59		*Frying-Pan Shoals Light-Vessel, No. 1*	33 34 (26) 77 49 (12)	Two fixed white	Refl'r.	{44 44}	12
60		CAPE FEAR	33 52 24 77 59 54	Flashing white every 30 seconds	4	99	15¾
61	CAPE FEAR RIVER. Range.	New Channel (front) Post Light	33 52 (38) 78 00 (02)	Fixed white	Lens lantern.	15	
62		New Channel (rear) Post Light	33 52 (51) 77 59 (37)	Fixed white	Lens lantern.	39	
63	Range.	Bald Head (front) Post Light	33 52 (25) 78 00 (09)	Fixed red	Lantern.	12	
64		Bald Head (rear) Post Light	33 52 (29) 77 59 (57)	Fixed red	Lantern.	15	
65	Range.	Smith Island (front) Post Light	33 53 (12) 77 59 (53)	Fixed red	Lens lantern.	13	
66		Smith Island (rear) Post Light	33 53 (36) 77 59 (34)	Fixed red	Lens lantern.	25	
67	Range.	New Cut (front) Post Light		Fixed white	Lantern.		
68		New Cut (rear) Post Light		Fixed white	Lantern.		
69		Lower Swash Channel Post Light, No. 2		Fixed red	Lantern.		
70	Range.	Snow Marsh Channel (front) Post Light	33 57 (47) 77 56 (44)	Fixed white	Lantern.	10	
71		Snow Marsh Channel (rear) Post Light	33 58 (06) 77 56 (21)	Fixed white	Lantern.	15	
72	Range.	Reeves Point Channel (front) Post Light	33 59 (31) 77 56 (46)	Fixed red	Lantern.	10	
73		Reeves Point Channel (rear) Post Light	33 59 (58) 77 56 (46)	Fixed red	Lantern.	15	
74		Midnight Channel Post Light, No. 1		Fixed white	Lantern.		
75		Old Brunswick Post Light, No. 3		Fixed white	Lantern.		
76		Orton Point Post Light, No. 5		Fixed white	Lantern.		
77		Lilliput Post Light, No. 4		Fixed red	Lantern.		
78		Campbell Island Post Light, No. 7		Fixed white	Lantern.		
79		Logs and Big Island Channel Post Light, No. 9		Fixed white	Lantern.		
80		First Western Jetty Post Light, No. 11		Fixed white	Lantern.		
81		Brunswick Channel Post Light, No. 6		Fixed red	Lantern.		
82		Fourth Eastern Jetty Post Light, No. 8		Fixed red	Lantern.		
83		Hospital Point Post Light, No. 10		Fixed red	Lantern.		
84		GEORGETOWN	33 13 (21) 79 10 (55)	Fixed white	4	85	15
85	WINYAH BAY.	Mosquito Creek Beacon, No. 1	33 15 (18) 79 13 (17)	Fixed white	Lantern.	13	
86		Marsh Islands Beacon, No. 3	33 16 (54) 79 14 (37)	Fixed white	Lantern.	13	
87		Frazier Point Beacon, No. 5	33 18 (10) 79 16 (47)	Fixed white	Lantern.	13	
88		Hare Island Beacon, No. 7	33 20 (21) 79 16 (45)	Fixed white	Lantern.	13	
89		Waccamaw Shoal Beacon, No. 2	33 20 (46) 79 18 (19)	Fixed red	Lantern.	13	
90		Sampit River	33 21 (09) 79 16 (22)	{Fixed red {Fixed white	Lantern.	{31 28}	

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
59	Two masts, schooner-rigged, mastheads black, with a black circular hoop-iron cage-work day mark at each. Hull, yellow, with the words "FRYING-PAN SHOALS" in black on each side and "No. 1" in black on each quarter. A black smokestack and fog signal between the masts.		12-inch steam whistle; blasts 5 seconds, silent intervals 55 seconds. If whistle be disabled a bell will be rung by hand.
60	White pyramidal tower	96	
61	Square, pyramidal, white, wooden skeleton structure on four piles		
62	Square, pyramidal, white, wooden skeleton structure on four piles		
63	White, pyramidal, wooden, skeleton structure		
64	White, pyramidal, wooden, skeleton structure		
65	Red, three-pile structure		
66	Red, three-pile structure		
67	Temporary pile structure		
68	Temporary pile structure		
69	Triangular pile structure, with number and square, red day mark		
70	Black three-pile structure, with red day mark 7 feet square		
71	Black three-pile structure, with red day mark 7 feet square		
72	Black three-pile structure, with white day mark 7 feet square		
73	Black three-pile structure, with white day mark 7 feet square		
74	Triangular pile structure, with number and square black day mark		
75	Triangular pile structure, with number and square white day mark		
76	Triangular pile structure, with number and square white day mark		
77	Triangular pile structure, with number and square red day mark		
78	Triangular pile structure, with number and square white day mark		
79	Triangular pile structure, with number and square black day mark		
80	Triangular pile structure, with number and square white day mark		
81	Triangular pile structure, with number and square red day mark		
82	Triangular pile structure, with number and square red day mark		
83	Triangular pile structure, with number and square red day mark		
84	White tower and dwelling	82	
85	Triangular, pyramidal cluster of three black piles, with "1" on square black day mark.		
86	Triangular, pyramidal cluster of three black piles, with "3" on square black day mark.		
87	Triangular, pyramidal cluster of three black piles, with "5" on square black day mark.		
88	Triangular, pyramidal cluster of three black piles, with "7" on square black day mark.		
89	Triangular, pyramidal cluster of three red piles, with "2" on square red day mark.		
90	Lights exhibited above the roof of small lantern room on pile foundation, all white.		

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
91	Mother Bunch Island Beacon, No. 9	33 22 (42) 79 14 (40)	Fixed white	Lantern.	13	
92	CAPE ROMAIN	33 01 (06) 79 22 (19)	Flashing white every minute	1	154	18½
93	Bull Bay	32 55 (35) 79 33 (53)	Fixed white. A dark sector in the light between E. by N. and S. by E.	4	49	12½
94	CHARLESTON	32 41 43 79 52 54	Fixed white	1	155	18½
95	*Charleston Light-Vessel, No. 34*	32 42 (08) 79 46 (08)	Two fixed white	Refl'r	{40} {40}	11½
96	Charleston Harbor. Main Channel Range. Fort Sumter (front)	32 45 (09) 79 52 (21)	Fixed white	5	51	12½
97	Charleston Harbor. Main Channel Range. St. Philip's Church (rear)	32 46 (44) 79 55 (38)	Fixed white	Refl'r	140	17¾
98	Charleston Harbor. Range. Mount Pleasant (front)	32 46 (04) 79 52 (06)	Fixed red	Lens lantern.	15	
99	Charleston Harbor. Range. Mount Pleasant (rear)	32 47 (07) 79 52 (42)	Fixed white	Refl'r	28	
100	Charleston Harbor. Range. South Channel (front)	32 45 31 79 51 18	Fixed white	6	26	10¼
101	Charleston Harbor. Range. South Channel (rear)	32 45 31 79 51 16	Fixed red	Lens lantern.	33	
102	Charleston Harbor. Fort Ripley Shoal (Middle-Ground)	32 45 (52) 79 54 (07)	Fixed red	5	44	8½
103	Charleston Harbor. Castle Pinckney Pierhead	32 46 (22) 79 54 (37)	Fixed red	Post lantern.	22	
104	Charleston Harbor. Sullivans Island Breakwater Beacon	32 46 (03) 79 51 (46)	Fixed red	Post lantern.	14	
105	Charleston Harbor. Hog Island Channel Beacon, No. 1	32 46 (56) 79 54 (40)	Fixed white	Post lantern.	13	
106	Charleston Harbor. Hog Island Channel Beacon, No. 2	32 46 (52) 79 54 (09)	Fixed red	Post lantern.	13	
107	Charleston Harbor. Shutes Folly Island Spit Beacon, No. 3	32 46 (59) 79 54 (47)	Fixed red	Post lantern.	13	
108	Charleston Harbor. Ashley River. East Marsh Island Beacon					
109	Charleston Harbor. Ashley River. Oyster Rock Beacon					
110	Charleston Harbor. Ashley River. West Marsh Island Beacon					
111	Charleston Harbor. Ashley River. Cowhead Reach Lower Beacon					
112	Charleston Harbor. Ashley River. Cowhead Reach Middle Beacon					
113	Charleston Harbor. Ashley River. Cowhead Reach Upper Beacon					
114	Wadmalaw River. Enterprise Beacon, No. 2	32 42 (07) 80 12 (12)	Fixed red	Post lantern.	12	
115	Wadmalaw River. Hart Beacon, No. 1	32 42 (10) 80 11 (51)	Fixed white	Post lantern.	12	
116	Wadmalaw River. Shaffer Beacon, No. 3	32 42 (24) 80 11 (39)	Fixed white	Post lantern.	12	

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
91	Triangular, pyramidal cluster of three black piles, with "9" on square black day mark.		
92	Red, octagonal tower; cornice of lantern, white; dome and balustrade, black. Old tower (conical), near by, white.	150	
93	Square, brown, pyramidal skeleton tower surmounted by a black lantern		
94	Conical tower, colored with alternate black and white horizontal bands, three of each color, commencing with black at the top. White double dwelling, to southwestward.	150	
95	Two masts; schooner-rigged; black oval day mark at each masthead. Hull, white; masts, yellow; topmasts, black. "CHARLESTON" on each side in black, and "No. 34" in black on each quarter.		Bell or horn.
96	White framework structure, with skeleton fog-bell tower close by. White frame dwelling, with green blinds.	25	Bell struck by machinery a double blow every 15 seconds.
97	White octagonal pyramidal church steeple		
98	White, triangular, pyramidal structure of three piles with square lantern deck and gallery.		
99	White, square, pyramidal structure of four piles with lantern deck and gallery		
100	Red structure		
101	Square black pyramidal skeleton structure		
102	White hexagonal screw-pile structure; piles, brown; lantern, yellow		Bell struck by machinery every 10 seconds.
103	Post on wharf	12	
104	Triangular, pyramidal cluster of three red piles		
105	Triangular, pyramidal cluster of three black piles with black day mark bearing the number "1."		
106	Triangular, pyramidal cluster of three red piles with red day mark bearing the number "2."		
107	Triangular, pyramidal cluster of three black piles with black day mark bearing the number "3."		
108	To be established		
109	To be established		
110	To be established		
111	To be established		
112	To be established		
113	To be established		
114	Triangular, pyramidal cluster of three red piles with red day mark bearing the number "2."		
115	Triangular, pyramidal cluster of three black piles with black day mark bearing the number "1."		
116	Triangular, pyramidal cluster of three black piles with black day mark bearing the number "3."		

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
117	HUNTING ISLAND	32 22 (34) 80 26 (14)	Flashing white every 30 seconds	2	133	17¾
118	*Martins Industry Light-Vessel, No. 53*	32 05 (33) 80 33 (15)	Two fixed white	Refl'r	{37¾ 37¾}	11¼
119	Range. Hilton Head (front)	32 09 (39) 80 43 (06)	Fixed white	4	32	10¾
120	Range. Hilton Head (rear)	32 09 (52) 80 44 (22)	Fixed white	Refl'r	92	15¼
121	Range. Paris Island (front)	32 17 (50) 80 40 (08)	Fixed white	Refl'r	45	12
122	Range. Paris Island (rear)	32 18 (51) 80 40 (44)	Fixed white	Refl'r	123	16
123	Skull Creek Beacon	32 16 (27) 80 44 (00)	Fixed white	Post lantern.	16	------
124	Range. Daufuskie Island (front)	32 08 (21) 80 49 (50)	Fixed white	Lens lantern.	18	------
125	Range. Daufuskie Island (rear)	32 08 (42) 80 49 (52)	Fixed white	5	61	12¾
126	Range. Bloody Point (front)	32 05 (18) 80 51 (55)	Fixed red	Refl'r	27	10
127	Range. Bloody Point (rear)	32 05 (50) 80 52 (20)	Fixed red	Refl'r	81	14½
128	Range. TYBEE	32 01 20 80 50 37	Fixed white	1	144	18
129	Range. Tybee Beacon	32 01 (12) 80 50 (18)	Fixed red	Refl'r	28	10½
130	SAVANNAH RIVER. Range. Jones Island (front) Beacon	------	Fixed white	Refl'r	15	------
131	SAVANNAH RIVER. Range. Jones Island (rear) Beacon	------	Fixed white	Refl'r	42	------
132	SAVANNAH RIVER. Cockspur Island	32 01 21 80 52 40	Fixed white	6	22	9¾
133	SAVANNAH RIVER. Range. Oyster Beds (front) Beacon	------	Fixed red	Refl'r	15	------
134	SAVANNAH RIVER. Range. Oyster Beds (rear)	32 02 20 80 53 33	Two fixed red	{6 Refl'r}	{32 31}	7½
135	SAVANNAH RIVER. Range. Tybee Knoll Cut (front)	32 01 (57) 80 54 (20)	Fixed white	6	24	10
136	SAVANNAH RIVER. Range. Tybee Knoll Cut (rear)	32 01 (57) 80 54 (44)	Fixed white	6	47	11¼
137	SAVANNAH RIVER. Long Island East Beacon	32 02 (07) 80 54 (55)	Fixed red	Post lantern.	40	------
138	SAVANNAH RIVER. Wing Dam No. 28 Post Light	------	Fixed white	Post lantern.	8	------
139	SAVANNAH RIVER. Venus Point	32 03 (47) 80 56 (40)	Fixed white	Lens lantern.	35	------
140	SAVANNAH RIVER. Jones Island	32 04 (25) 80 57 (32)	Fixed red	Post lantern.	40	------
141	SAVANNAH RIVER. Range. Elba Island (front)	32 04 (23) 80 58 (28)	Fixed red	Refl'r	33	------
142	SAVANNAH RIVER. Range. Elba Island (rear)	32 04 (35) 80 58 (56)	Fixed red	Refl'r	60	------
143	SAVANNAH RIVER. Wing Dam No. 10 Post Light	------	Fixed white	Post lantern.	8	------
144	SAVANNAH RIVER. Wing Dam No. 25 Post Light	------	Fixed white	Post lantern.	8	------
145	SAVANNAH RIVER. Wing Dam No. 4 Post Light	------	Fixed white	Post lantern.	8	------
146	SAVANNAH RIVER. Barnwell Place (Oglethorpe Range Rear) Post Light	32 05 (56) 80 59 (47)	Fixed white	Post lantern.	40	------

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
117	Conical tower, lower part white, upper part black	121	
118	Steam light-vessel, two masts, schooner-rigged, no bowsprit; mastheads black, with a black circular iron cagework day mark at each. Hull, red, with "MARTINS INDUSTRY" in white on each side and "No. 53" in white on each quarter. A black smokestack and the fog signal between the masts.		12-inch steam whistle; blasts, 6 seconds; silent intervals, 54 seconds. If whistle be disabled a bell will be rung by hand.
119	White pyramidal beacon	31	
120	White skeleton tower; two white dwellings near	89	
121	Lantern on a square, white, pyramidal skeleton structure, upper part inclosed	45	
122	Triangular skeleton pyramid, covered with black slats for 40 feet from top, white below.	120	
123	Lantern on a triangular cluster of three white piles with square, white day mark		
124	Tower, white; lantern, red	15	
125	Red lantern on white dwelling	49	
126	Square, white, pyramidal, skeleton, iron structure	20	
127	Triangular skeleton tower, white for 50 feet from base and red above to top	81	
128	Octagonal brick tower; lower 50 feet black, upper part white; lantern, black	134	
129	Skeleton tower, with seaward side inclosed, painted white		
130	Square, white, four-pile structure		
131	Square, white, pyramidal wooden skeleton structure		
132	Conical white tower	20	
133	Square, white, four-pile structure		
134	White, pyramidal tower; top of lantern, black	30	
135	Lantern on white dwelling		
136	White skeleton tower	46	
137	Brown triangular skeleton tower		
138	Cluster of three black piles		
139	Brown triangular skeleton tower, with white dwelling in front		
140	Brown triangular skeleton tower		
141	Brown triangular skeleton tower, with white dwelling in rear		
142	Brown triangular skeleton tower		
143	Cluster of three black piles		
144	Cluster of three red piles		
145	Cluster of three black piles		
146	Brown triangular skeleton tower		

TABLE OF LIGHTS—Continued.

Number.			Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
				° ′ ″				
147	Savannah River—Continued.		Proctor Place Beacon		Fixed white	Post lantern.	14	
148			Oglethorpe Range (front) Beacon		Fixed white	Post lantern.	14	
149			Mackey Point Post Light	32 05 (20) 81 01 (06)	Fixed white	Post lantern.	8	
150		Range.	Fort Jackson (front)	32 05 (12) 81 01 (22)	Fixed red	Post lantern.	30	
151			Fort Jackson (rear)	32 05 (06) 81 01 (27)	Fixed red	Post lantern.	40	
152		Range.	Fig Island (front)	32 04 (48) 81 03 (50)	Fixed red	Refl'r	23	
153			Fig Island (rear)	32 04 (50) 81 05 (21)	Fixed red	Refl'r	123	
154	St. Catherines Sound							
155	Sapelo			31 23 (28) 81 17 (01)	Fixed white, varied by a white flash every 45 seconds.	4	74	14¼
156	Range.		St. Simon	31 08 02 81 23 30	Fixed white, varied by flashes, alternately red and white; interval between flashes, 1 minute.	3	104	16
157			St. Simon Beacon		Fixed white	Refl'r	25	10
158	Entrance to St. Simon Sound and Brunswick Harbor.	Range.	Plantation Creek (front) Beacon	31 08 17 81 26 10	Fixed white	Refl'r	12	
159			Plantation Creek (rear) Beacon	31 08 25 81 26 41	Fixed white	Refl'r	27	
160		Range.	Jekyl Island (front) Beacon	31 05 37 81 26 57	Fixed red	Refl'r	12	
161			Jekyl Island (rear) Beacon	31 05 14 81 27 25	Fixed red	Refl'r	27	
162		Range.	Colonels Island (front) Beacon	31 07 37 81 31 08	Fixed white	Lens lantern.	12	
163			Colonels Island (rear) Beacon	31 07 47 81 31 37	Fixed white	Refl'r	27	
164	Little Cumberland Island			30 58 34 81 24 40	Fixed white	3	71	14
165	Fernandina Entrance.	North Range.	Tiger Island (front)	30 42 (38) 81 28 (50)	Fixed white	Lens lantern.	12	
166			Tiger Island (rear)	30 42 (39) 81 29 (05)	Fixed white	Lens lantern.	30	
167		South Range.	Tiger Island (front)	30 41 (37) 81 28 (00)	Fixed white	Post lantern.	12	
168			Tiger Island (rear)	30 41 (34) 81 28 (01)	Fixed white	Post lantern.	18	
169	Amelia Island			30 40 23 81 26 26	Flashing white every 90 seconds	3	107	16¼
170	St. Johns River.		St. Johns River (Mayport Range rear)	30 23 36 81 25 27	Fixed white	3	77	14½
171		Range.	Pilot Town Beacon (front)	30 24 (16) 81 24 (49)	Fixed white	Lens lantern.	13	
172			Pilot Town Beacon (rear)	30 24 (22) 81 25 (17)	Fixed white	Lens lantern.	30	
173			Mayport Range Beacon (front)	30 23 (39) 81 25 (11)	Fixed white	Lens lantern.	27	
174		Range.	Fort George Creek Beacon (front)	30 24 (17) 81 25 (08)	Fixed red	Post lantern.	13	
175			Fort George Creek Beacon (rear)	30 24 (22) 81 25 (20)	Fixed red	Post lantern.	21	

The numerous post lights and beacons in the St. Johns River have been omitted on account of frequent and numerous changes.

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
147	Triangular cluster of three red piles, with red day mark		
148	Triangular cluster of three white piles, with white day mark		
149	Cluster of three white piles		
150	Brown triangular skeleton tower		
151	Brown triangular skeleton tower		
152	Square white lantern room, on pile foundation		
153	Brown tower of Exchange Building, Savannah	90	
154	To be built		
155	Tower colored, with alternate red and white horizontal belts; lantern, black; dwelling, white.	70	
156	White conical tower, with black lantern, attached to a two-story brick dwelling with red roof.	100	
157	Square, white, pyramidal, wooden skeleton structure	20	
158	Square, white, four-pile structure		
159	Square, white, pyramidal, wooden skeleton structure		
160	Square, white, four-pile structure		
161	Square, white, pyramidal, wooden skeleton structure		
162	Square, white, four-pile structure		
163	Square, white, pyramidal, wooden skeleton structure		
164	White tower	61	
165	White wooden skeleton structure		
166	White wooden skeleton structure		
167	White wooden skeleton structure		
168	White wooden skeleton structure		
169	White tower; lantern, black; dwelling detached	58	
170	Red brick tower; lantern, black; dwelling, white	74	
171	Square, black, four-pile structure with pedestal for lantern		
172	Square, white, pyramidal, wooden skeleton structure on four piles		
173	White, pyramidal, wooden skeleton structure with pedestal for lantern	23	
174	Triangular, pyramidal cluster, of three black piles with square black day mark		
175	Triangular, pyramidal cluster of three white piles with square white day mark		

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
176	ST. AUGUSTINE	29 53 07 81 17 12	Fixed white, varied by a white flash every 3 minutes.	1	161	18¾
177	MOSQUITO INLET	29 04 (49) 80 55 (33)	Fixed white	1	159	18¾
178	CAPE CANAVERAL	28 27 (37) 80 32 (30)	Flashing white every minute	1	137	17¾
179	JUPITER INLET	26 56 54 80 04 48	Fixed white, varied by a white flash every 90 seconds.	1	146	18¼
180	Ranges. Biscayne Bay Beacon (front)					
181	Biscayne Bay Beacon (rear)					
182	FOWEY ROCKS	25 35 25 80 05 41	Fixed white, from S. ⅝ W. through eastward to N. ¼ W.; from N. by E. ¾ E. through southwestward to E. ¼ N., and from E. ¾ S., through northwestward to S. ¼ E.; fixed red throughout the intervening sectors.	1	110¼	16¼
183	CARYSFORT REEF	25 13 (17) 80 12 (40)	Flashing white, from SSW. ½ W. through eastward and southward to NNE. ⅛ E. from NE. ⅛ E. through southwestward to E. ⅛ N., and from SE. ⅝ S. to S. ⅛ W.; flashing red throughout the intervening sectors; interval between flashes, 30 seconds.	1	100	15¾
184	ALLIGATOR REEF	24 51 (02) 80 37 (08)	Flashing white and red; every third flash red, from SW. by W. ⅓ W. through southward to NE. ⅛ E., and from NE. by E. ¾ E. through northward to SW. ⅝ S.; flashing red throughout the intervening sectors; interval between flashes, 5 seconds.	1	135½	18
185	SOMBRERO KEY	24 37 (36) 81 06 (40)	Fixed white, from SW. ⅓ S. to SW. by W.; from WSW. ⅝ W. through southward to ENE., and from E. ¼ S. through northwestward to S. by E. ¾ E.; fixed red throughout the intervening sectors.	1	142	18
186	AMERICAN SHOAL	24 31 (24) 81 31 (13)	Flashing white, from W. ⅞ S. through southward to NE. by E. ¾ E.; from E. ¼ N. to ESE., and from SE. ⅝ E. through northward to SW. by W. ¼ W.; flashing red throughout the intervening sectors; interval between flashes, 5 seconds.	1	109	16¼
187	Cape Florida Shoal Beacon					
188	Bowles Bank Beacon					
189	Old Rhodes Bank Beacon					
190	Basin Hill Beacon					
191	Mosquito Bank Beacon					
192	Hen and Chickens Shoal Beacon		Fixed red	Post lantern.	31	
193	Long Key Shoal Beacon					
194	East Turtle Shoal Beacon		Fixed white	Post lantern.	31	
195	East Washerwoman Shoal Beacon		Fixed white	Post lantern.	30	
196	Bahia Honda Beacon					
197	Loggerhead Key Beacon					
198	Four-Foot Shoal Beacon		Fixed white	Post lantern.	31	
199	Pelican Key Beacon					
200	East Triangle Beacon					

Florida Reefs. Hawk Channel.

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
176	Conical tower; foundation, white, with black cornice; shaft, col red with black and white spiral bands; below lantern deck, black; above, red; dwelling white.	150	
177	Conical tower of red brick, natural color, surmounted by black lantern	152	
178	Iron conical tower, colored with alternate white and black horizontal bands, commencing with white below the lantern, which is black. Two one-and-a-half story dwellings, white, with green blinds; as seen from the sea, one to the northward, the other to the southward of the tower.	134	
179	Tower of red brick, natural color; oil room near tower. One-and-a-half story stone dwelling and two-story white dwelling.	94	
180	*To be established*		
181	*To be established*		
182	Dark-brown pyramidal framework, on pile foundation, inclosing white dwelling and stair cylinder; lantern, black; window blinds, green.		
183	Dark-brown pyramidal framework, on pile foundation, inclosing low cylindrical dwelling, and stair cylinder; lantern, black.		
184	White pyramidal framework, on black pile foundation, inclosing square dwelling and stair cylinder; lantern, black.		
185	Brown pyramidal framework, on pile foundation, inclosing square dwelling and stair cylinder; lantern, black.		
186	Dark brown pyramidal framework, on pile foundation, inclosing dwelling and white stair cylinder; lantern, black.		
187	*To be established*		
188	*To be established*		
189	Square, pyramidal structure, upper part lattice work		
190	Square, pyramidal structure, upper part lattice work		
191	Square, pyramidal structure, upper part lattice work		
192	Red, square, pyramidal structure, covered with horizontal slats; on four piles; "H. & C." in white on each side of base.		
193	Red, square, pyramidal structure, upper part lattice work		
194	Black, square, pyramidal structure, covered with horizontal slats; on four piles; "E. T." in white on each side of base.		
195	Black, square, pyramidal structure, covered with horizontal slats; on four piles; "E. W." in white on each side of base.		
196	Red, square, pyramidal structure, upper part lattice work		
197	Red, square, pyramidal structure, upper part lattice work		
198	Black, square, pyramidal structure, covered with horizontal slats; on four piles; "D. H." in white on each side of base.		
199	Black, square, pyramidal structure, upper part lattice work		
200	Red, square, pyramidal structure, upper part lattice work		

TABLE OF LIGHTS—Continued.

Number.	Name.	Latitude, north. Longitude, west.	Characteristics of light.	Order of light.	Height of light above sea level, in feet.	Distance visible, in nautical miles.
		° ′ ″				
201	SAND KEY	24 27 10 81 52 40	Fixed white for 1 minute, varied in next minute by a white flash of 10 seconds' duration, preceded and followed by partial eclipses of 25 seconds from S. by W. ⅜ W. to SW. ¼ W.; from W. ¾ S. through southward to ENE. ¼ E.; from E. ⅞ N. to SE. by E. ⅞ E., and from SE. ¾ E. to S. ½ W.; fixed red for 1 minute, varied in the next minute by a red flash of 10 seconds' duration, preceded and followed by partial eclipses of 25 seconds throughout the intervening sectors.	1	109	16¼
202	KEY WEST Harbor. — KEY WEST	24 32 58 81 48 04	Fixed white, from N. ¼ W. through southwestward to NE. ⅝ E.; from NE. by E. $\frac{13}{16}$ E. through westward to SE. ⅜ E., and from SE. ⅛ S. through the northward and eastward to NW. ¾ N., fixed red throughout the intervening sectors.	3	90½	15¼
203	Main Ship Channel Range. — Key West (front)		Fixed red	Post lantern.	16½	
204	Main Ship Channel Range. — Key West (rear)		Fixed red	Post lantern.	25½	
205	Northwest Channel. — Middle Ground Beacon					
206	Northwest Channel. — Northwest Passage	24 37 (04) 81 53 (58)	Fixed white, from S. by W. ⅜ W. through northeastward to NW. ¾ W., and from NNW. ⅛ W. through southward and westward to S. by W.; fixed red throughout the intervening sectors.	4	47	12¼
207	Northwest Channel. — Northwest Bar Beacon					
208	Rebecca Shoal	24 35 (03) 82 35 (07)	Flashing alternately red and white, excepting from WSW. ¼ W. southward to NW. by W. ½ W. in which sector every flash is red; interval between flashes, 5 seconds.	4	66	13¾
209	DRY TORTUGAS	24 38 04 82 55 42	Fixed white, with a fixed red sector from NE. by N. northward to ENE. ½ E.	1	151½	18¼
210	Tortugas Harbor	24 37 (46) 82 52 (50)	Fixed white from SW. to SW. ¾ W.; from W. ½ N. through southward to NE. by E. ¼ E.; and from E. ¾ N. through northwestward to S.; fixed red throughout the intervening sectors.	4	67	13¾

In the foregoing table the names of the lights are printed as follows, viz:

1st. PRIMARY SEACOAST LIGHTS.

2d. SECONDARY SEACOAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, and harbor lights.

The geographical positions of lighthouses, which are uncertain by some seconds, not having yet been very accurately determined, and those of light-vessels, which vary somewhat in position, have the seconds inclosed thus: 35° 45′ (57″).

In the column of "Distance visible, in nautical miles," will be found the distances at which the lights can be seen, under ordinary states of the atmosphere, by observers at elevations of fifteen feet above the level of the sea.

CAPE HENRY TO DRY TORTUGAS—Continued.

Number.	Color and peculiarity of lighthouse or vessel.	Height, in feet, from base of structure to center of lantern.	Fog signal.
201	Brown pyramidal framework, on pile foundation, inclosing square dwelling and stair cylinder; lantern, black.		
202	White tower and black lantern; detached white dwelling, with green blinds	80	
203	Lantern on a white pyramidal framework		
204	Lantern on a small white platform on ridge of buoy shed		
205	*To be established*		
206	White dwelling surmounted by a black lantern, on a brown screw-pile foundation		
207	*To be established*		
208	Square one-and-one-half-story dwelling, surmounted by lantern, on iron pile foundation. Foundation, brown; dwelling, white, with green blinds; lantern, black.		
209	Conical tower; lower half, white; upper half, lantern, and dome, black. Oil room near tower; dwelling a short distance to southward; both of yellow brick.	143	
210	Brown, hexagonal, pyramidal tower; lantern, black	25	

In the column of "Characteristics of light," the time between the flashes is given from beginning of one flash to the beginning of the next succeeding one, and bearings are given from seaward.

Vessels approaching or passing light-vessels of the United States in *foggy* or *thick weather* will be warned of their proximity by the sounding of a *bell, fog horn, or whistle*, on board of the light-vessels, at intervals not exceeding five minutes.

The fact should be noted that sound signals are not always reliable. The sound may be lost while really approaching it, after being heard; or even when approached until close-to, it may not be heard at all, though properly made. These conditions are the exception, not the rule. They are, however, always possible and render great care necessary.

TABLE OF LIGHTS.*

Number.	Name.	Location.	Latitude.	Longitude.	Number of lights and relative positions.	Character of light.	Interval of revolution or flash.
			N. ° ′ ″	W. ° ′ ″			
1	GREAT ISAAC	On the island	26 02 00	79 06 00	1	Rev.	Every ½ minute
2	GUN CAY	Near S. point	25 34 30	79 18 26	1	Rev. red.	Every 1½ min
3	GREAT STIRRUP CAY	1,800 feet from E. end of cay	25 49 40	77 53 55	1	F.	
4	ABACO	Hole in Wall, on SE. point	25 51 30	77 10 45	1	Rev.	Every minute
5	ABACO	CHEROKEE (CHEROKI) SOUND. On Duck Cay.	26 16 20	77 04 00	1	F. red.	
6	ABACO	LITTLE HARBOR. South side of entrance	26 19 45	76 59 15	1	F. red.	
7	ABACO	Little Guana or Elbow Cay; ¾ of a mile inland.	26 31 10	76 57 36	1	F.	
8	Egg Island	On summit of island, NE. Providence Channel.	25 30 30	76 53 00	1	F.	
9	NASSAU HARBOR	Hog Island, W. point	25 05 37	77 21 58	1	F. white or red.	
10	NASSAU HARBOR	Athol Island	25 04 58	77 17 27	1	F.	
11	Double-Headed Shot Cay	NW. Edge Cay Sal Bank	23 56 30	80 27 51	1	F.	
12	NORTH COAST OF CUBA. Cruz del Padre Cay	On reef, ¾ of a mile NE. of cay; or ¾ mile from SE. extremity of surrounding reef.	23 17 07	80 53 20	1	F.	
13	NORTH COAST OF CUBA. Bahia de Cadiz Cay	NE. part of cay	23 12 34	80 29 26	1	F. & Fl.	Every minute
14	NORTH COAST OF CUBA. Cardenas Bay	Cay Piedras, Los Pinzones, N. side of entrance to the bay.	23 14 10	81 07 20	1	F. with red Fl.	Every 2 minutes
15	NORTH COAST OF CUBA. Cardenas Bay	Cay Diana, W. part	23 09 56	81 06 07	1	F.	
16	NORTH COAST OF CUBA. Habana	Morro castle, E. side of entrance	23 09 21	82 21 30	1	Rev.	Every ½ minute

* This table is compiled from List of Lights of the World, Vol. I, published by the United States Hydrographic Office, and includes only those mentioned in the text of this volume.

ABBREVIATIONS AND EXPLANATIONS.

LIGHTS.

F. Fixed. Continuously steady and visible.

FL. Flashing. Flashes or groups of flashes. A flash means a flood of light instantaneously appearing and disappearing.

F. & FL. Fixed and flashing. The flash may occur during the continuance of the fixed light, which it intensifies, or the latter may show for an interval and then be eclipsed for an interval, during which the flashes will appear.

REV. Revolving. Light appears and gradually increases to full effect, and then gradually decreases to eclipse. (At short distances and during clear weather, instead of an eclipse a faint continuous light may be observed.)

INT. Intermittent. Suddenly appearing in view, remaining steady and visible for a certain time, and then as suddenly eclipsed for a time. This term includes occulting.

ALT. Alternating. Red and white light, alternately, at equal intervals, without any intervening eclipse.

BAHAMA ISLANDS AND N. COAST OF CUBA.

Number.	Height of light above sea level.	Distance visible, in nautical miles.	Character of lighthouse or vessel.	Height of tower, from base to vane.	Character and order of illuminating apparatus.	Remarks.
1	158	16	Iron, with broad red and white horizontal bands; lantern, white.	145	C., 1st ord.	Eclipses not total within 6 miles.
2	80	12	Conical; upper part, red; lower part, white; lantern, white.	70	C	Not visible between S. 17° W. and S. 6° E., being intercepted by the Bemini Isles when 8 miles distant. Reported visible 12 seconds every 70 seconds at a distance of about 9 miles.
3	81	15	Circular; red and white bands	46	D., 3d ord.	Visible between N. 54° W. and N. 45° E., over an arc of 261°.
4	160	20	Conical; stone; lower part, white; upper part, red; lantern, white.	85	C	Visible between S. 47° W. and S. 65° E., through west and north. *Reported irregular.*
5	29	6	Small, wooden tower	22		Visible between the bearings S. 48° W. and S. 87° E., over an arc of 225°, except where obscured to the eastward by the high land of Cherokee Point.
6	58	6	Small, wooden tower	22		Visible between the bearings S. 33° E. and N. 12° E., over an arc of 225°.
7	123	15	Circular; stone; with red and white bands; lantern, white.	77	D., 1st ord.	
8	72	10	Wooden structure; white	27		Warning light for the dangerous reefs in the vicinity of Egg and Royal islands. Visible over an arc of 337½° between the bearings S. 45° 30′ W. and S. 68° W.
9	68	10	Conical; stone; white	58	C	Visible between N. 25° E. and N. 26° W., illuminating an arc of 309°. Shows RED instead of white whenever the state of the bar at entrance to Nassau is such as to be considered impassable or dangerous to vessels entering the harbor. *Visibility reported to be greater than that given*, red light not visible as far.
10	50	8	From a cupola of quarantine office			Visible between N. 23° W. and N. 68° W., through an arc of 45°.
11	96	15	Conical; stone; white; upper part, red.	58	D., 2d ord.	Not visible when bearing about S. 66° W., intercepted by Water Cay when 9 miles distant.
12	49	10	Conical; white	46	C. D., 4th ord.	Unreliable.
13	175	20	Conical; iron; white	159	C. D., 1st ord.	
14	75	14	Square lantern on house; white	67	C. D., 4th ord.	
15	46	9	Iron column		D	Harbor light, visible all around horizon, except an arc of 16° toward the south.
16	144	18	Stone color; "O'DONNELL" thereon	79	C. D., 1st ord.	The light is extinguished for ten minutes after midnight to clean and trim the lamps. Tower visible 5 miles. Semaphore.

ABBREVIATIONS AND EXPLANATIONS.

ILLUMINATING APPARATUS.

C. Catoptric, or by metallic reflectors.
D. Dioptric, or by refracting lenses.
ORD. Order or class of apparatus, numbered from the first to the sixth order.

N. North. | E. East. | S. South. | W. West.

The bearings are *true*, and are given *from* the ship, *not from* the light.
Measurements are given in English feet, yards, and nautical miles.
The distance the lights are visible is calculated from a height of fifteen feet above the level of the sea at high water.
Lights are to be considered as *white* unless otherwise stated.
The geographical positions of the lights must be considered as approximate.
Telegraphic determinations of longitude are underscored.

BEARINGS AND DISTANCES.

The following bearings and distances serve to indicate relative positions of certain aids to navigation. An inspection of the charts will enable the mariner to select from the bearings given the ones which may be used as courses.

Cape Hatteras Lighthouse.—The following are bearings and distances from Cape Hatteras Lighthouse:—

	Miles.
Cape Henry Lighthouse, **N. ¾ W. Westerly**	103
Currituck Beach Lighthouse, **N. ¾ W.**	69⅛
Bodie Island Lighthouse, **N. Easterly**	33½
Little Guana or Elbow Key Lighthouse, **S. by W.**	530¾
Matanilla Shoal (northwest end), **SSW**	506
Jupiter Inlet Lighthouse, **SSW. ⅝ W**	551
Cape Canaveral Lighthouse, **SW. by S. Southerly**	482
St. Johns River Lighthouse, **SW. ⅛ W**	417½
Cape Lookout Lighthouse, **SW. by W.**	62¼
Tybee Lighthouse, **SW. by W. Southerly**	329
Charleston Light-vessel, **SW. by W.**	261
Cape Fear Lighthouse, **SW. by W. ¼ W. Southerly**	148
Ocracoke Lighthouse, **WSW. ½ W. Southerly**	24½

Diamond Shoal Light-vessel.—The following are bearings and distances from Diamond Shoal Light-vessel:—

	Miles.
Cape Lookout Lighthouse, **WSW. ⅛ W. Southerly**	67¾
Frying Pan Shoals Light-vessel, **SW. by W. Westerly**	155¾
Charleston Light-vessel, **SW. by W. ¼ W. Westerly**	266
Martins Industry Light-vessel, **SW. by W. ⅛ W**	319½
St. Simon Lighthouse, **SW. ¾ W. Westerly**	388½
Amelia Island Lighthouse, **SW. ½ W. Westerly**	408½
St. Johns River Lighthouse, **SW. ⅝ W**	419½
Matanilla Shoal (northwest end), **SSW. ⅛ W. Southerly**	502

Frying Pan Shoals Light-vessel.—The following are bearings and distances from Frying Pan Shoals Light-vessel:—

	Miles.
Cape Lookout Lighthouse, **NE. ¼ E**	90
St. Augustine Lighthouse, **SW. ½ S**	283¾
St. Johns River Lighthouse, **SW. Southerly**	264½
Amelia Island Lighthouse, **SW. ⅛ W**	253
Little Cumberland Island Lighthouse, **SW. ⅝ W**	239½
St. Simon Lighthouse, **SW. ½ W. Westerly**	231¾
Sapelo Lighthouse, **SW. ¾ W**	218
Martins Industry Light-vessel, **SW. by W. ⅛ W**	164
Hunting Island Lighthouse, **SW. by W. ½ W**	150
Cape Romain Lighthouse, **WSW**	84½
Georgetown Lighthouse, **WSW. ½ W. Westerly**	71½

Martins Industry Light-vessel.—The following are bearings and distances from Martins Industry Light-vessel:—

	Miles.
Hunting Island Lighthouse, **N. by E. ⅝ E**	18
Charleston Light-vessel, **NE. ¼ E. Northerly**	54
Cape Romain Lighthouse, **NE. ¼ E. Northerly**	82
Jupiter Inlet Lighthouse, **S. ⅝ E**	310
Cape Canaveral Lighthouse, **S. ⅛ E. Southerly**	218
St. Augustine Lighthouse, **S. by W. ⅜ W**	137¾
St. Johns River Lighthouse, **SSW. Westerly**	111½
Amelia Island Lighthouse, **SSW. ½ W. Southerly**	96½
Little Cumberland Island Lighthouse, **SSW. ⅞ W**	80¼
St. Simon Lighthouse, **SW. ¾ S. Southerly**	71¾
Sapelo Lighthouse, **SW. ⅜ S**	56¼
Tybee Lighthouse, **WSW. ½ W**	15¼

Cape Canaveral Lighthouse.—The following are bearings and distances from Cape Canaveral Lighthouse:—

	Miles.
Mosquito Inlet Lighthouse, **NNW. ⅝ W**	42½
St. Augustine Lighthouse, **NNW. ¼ W**	94
St. Johns River Lighthouse, **NNW. Westerly**	125
Amelia Island Lighthouse, **N. by W. ¾ W. Northerly**	141
St. Simon Lighthouse, **N. by W. ½ W. Northerly**	166½
Sapelo Lighthouse, **N. by W. ⅛ W**	180
Charleston Light-vessel, **N. ¾ E**	257
Cape Romain Lighthouse, **N. by E. Easterly**	280¼
Cape Fear Lighthouse, **NNE. Northerly**	350¼
Jupiter Inlet Lighthouse, **S. by E. ½ E. Southerly**	94

Fowey Rocks Lighthouse.—The following are bearings and distances from Fowey Rocks Lighthouse:—

	Miles.
Jupiter Inlet Lighthouse, **N. ⅛ W. Northerly**	81½
Settlement Point, Bahama Island, **NE ½ N. Easterly**	88⅛
Great Isaac Lighthouse, **NE.** by **E. ½ E**	60
Gun Key Lighthouse, **E. Northerly**	42½
Elbow Key Lighthouse, **S. ⅞ W**	101

Alligator Reef Lighthouse.—The following are bearings and distances from Alligator Reef Lighthouse:—

	Miles.
Carysfort Reef Lighthouse, **NE. ¼ N. Easterly**	31½
Beacon T (Molasses Reef), **NE. ⅝ E**	16½
Gun Key Lighthouse, **NE** by **E. Easterly**	83½
Elbow Key Lighthouse, **S.** by **E. Southerly**	55
Cruz del Padre Key Lighthouse, **S. ⅝ W**	94¾
Santa Cruz (port entrance), **SSW. ⅞ W**	125
Morro Lighthouse, **SW. ⅜ S**	139½
Sombrero Key Lighthouse, **SW.** by **W. ½ W. Southerly**	30

Sand Key Lighthouse.—The following are bearings and distances from Sand Key Lighthouse:—

	Miles.
Northwest Passage Lighthouse, **N. ¾ W. Westerly**	10
Key West Lighthouse, **NE.** by **N. Easterly**	7¼
Sombrero Key Lighthouse, **ENE. ½ E. Easterly**	43
American Shoal Lighthouse, **ENE. ¾ E**	20
Elbow Key Lighthouse, **ESE. ¼ E**	83½
Cruz del Padre Lighthouse, **SE. ½ S. Easterly**	88¾
Santa Cruz (port entrance), **S. Westerly**	78¼
Morro Lighthouse, **S.** by **W. ½ W**	82¼
Dry Tortugas Lighthouse, **W. ¼ N**	57¾
Rebecca Shoal Lighthouse, **W. ¾ N. Northerly**	39½

Dry Tortugas Lighthouse.—The following are bearings and distances from Dry Tortugas Lighthouse:—

	Miles.
Sand Key Lighthouse, **E. ½ S**	57¾
Northwest Channel Lighthouse, **E. ⅛ N**	56
Sanibel Island Lighthouse (Punta Rasa Harbor), **NNE**	119¾
Egmont Keys Lighthouse (Tampa Bay), **N. Easterly**	177¾
Cedar Keys Lighthouse, **N. ⅜ W**	267¾
St. Marks Lighthouse, **N.** by **W. ¼ W. Westerly**	333¼
Cape St. George Lighthouse, **NNW. ⅛ W**	318¼
Pensacola Lighthouse, **NW. ⅝ N**	415
Sand Island Lighthouse, **NW. ⅛ N. Northerly**	431¼
Horn Island Lighthouse, **NW. Westerly**	448½
South Pass Lighthouse, **NW.** by **W. Northerly**	425
Bolivar Point Lighthouse, **WNW. ¼ W. Westerly**	693¾
Matagorda Lighthouse, **W.** by **N. Westerly**	758¼
Tampico Harbor Lighthouse, **WSW. ⅛ W. Westerly**	828¼
Vera Cruz Lighthouse (Convent of San Francisco), **SW.** by **W. ½ W. Southerly**	804¼
Cape San Antonio Lighthouse, **SSW. ¾ W**	200¾
Morro (Habana) Lighthouse, **SSE**	94
Cruz del Padre Key Lighthouse, **SE.** by **E. Easterly**	138

Abaco (Hole in the Wall) Lighthouse.—The following are bearings and distances from Abaco Lighthouse:—

	Miles.
Egg Island Lighthouse, **SE. ⅝ S**	26½
Great Stirrup Key Lighthouse, **W. ¼ S**	39
Great Isaac Lighthouse, **W. ½ N**	104½
Nassau Harbor Lighthouse, **S.** by **W. Westerly**	47

VARIATION OF THE COMPASS.

The magnetic variations for 1901, and annual increase or decrease at points mentioned, are as follows:

Locality.	Variation.	Annual increase or decrease.
Off Cape Henry (10 miles)	4° W.	3′ increase.
Off Cape Hatteras (12 miles)	4° W.	3′ "
Off Cape Lookout (15 miles)	3° W.	3′ "
Off Cape Fear (15 miles)	1½° W.	3′ "
Off Charleston Entrance	¼° W.	3′ "
Off Savannah Entrance	¾° E.	3′ decrease.
Off Doboy Entrance	1° E.	3′ "
Off St. Johns River Entrance	1° E.	3′ "
Off Cape Canaveral (12 miles)	1° E.	3′ "
Between Great Isaac and Coast of Florida	1⅓° E.	3′ "
Off Sand Key Lighthouse	2° E.	3′ "
Tortugas Island	2¾° E.	3′ "
East of Hole in the Wall Lighthouse	¼° E.	2½′ "
Off Carysfort Reef Lighthouse	1¾° E.	3′ "
Middle of Albemarle Sound, off Bull Bay	3⅓° W.	3′ increase.
Middle of Croatan Sound	4° W.	3′ "
Middle of Pamlico Sound, north of Ocracoke Inlet	3¼° W.	3′ "

GENERAL REMARKS ON APPROACHING OR SAILING ALONG THE COAST BETWEEN CHESAPEAKE ENTRANCE AND KEY WEST.

Soundings.—Between Chesapeake Entrance and Jupiter Inlet, a judicious use of the lead will give the mariner timely warning of his approach to the land from seaward.

Northward of Hatteras the 20-fathom curve is from 13 to 45 miles offshore; but inside of 15 fathoms the depths are irregular and there are many holes of limited extent lying inside of the general limits of corresponding depth, 10 and 14 fathoms being found in places only 1½ miles from shore. This irregularity of depth is apt to confuse and lead the mariner into danger in thick weather; the greatest caution should therefore be used in approaching inside of a depth of 20 fathoms. By keeping over 5 miles from the beach all dangers will be avoided, but the strong currents which sometimes set along the shore must be considered, especially after a gale.

Southeastward of Cape Hatteras and off the end of Hatteras Shoals, which extend to seaward about 8 miles, the 20-fathom curve is from 12 to 15 miles offshore, and the 30-fathom curve but a short distance outside of the former. This is as close as vessels should pass the cape, and in thick weather soundings of 20 fathoms or less should warn the mariner to keep offshore.

Between Cape Hatteras, where the 20-fathom curve is 12 miles offshore, and Jupiter Inlet, where it is but 4 miles from the shore, the curve is fairly regular and for a greater part of the distance it is from 40 to 50 miles offshore. Northward of St. Johns River entrance the water shoals fairly regular to the 10-fathom curve, which, excepting in the two great bights between Cape Hatteras and Cape Fear, is from 10 to 20 miles offshore. Vessels approaching from sea to make any of the harbors between Cape Fear and St. Johns River entrance, should approach the land with caution when in 10 fathoms of water, and in thick weather it is advisable to keep in this depth; inside of the 10-fathom curve the soundings are irregular and shoal spots, with soundings of 5 fathoms or less, will be found from 6 to 12 miles from the shore. Vessels standing along the coast should, in thick weather, keep a general depth of 10 fathoms when between Cape Fear and St. Johns River entrance.

Southward of St. Johns River entrance the 20-fathom curve draws inshore gradually and at Jupiter Inlet is only 4 miles from the beach and the 100-fathom curve a little over 8 miles. Southward of Jupiter Inlet both these curves draw closer inshore, and along the Florida Reefs the 20-fathom curve is close in to the reefs, while the 100-fathom curve is at an average distance of about 7 miles outside of the reefs. The 10-fathom curve between St. Johns River entrance and Jupiter Inlet is very irregular and of no use to determine distance from the shore. Approaching the land or Florida Reefs southward of Jupiter Inlet the lead is but of little use unless soundings are taken very frequently, as the water

shoals rapidly from seaward. When the water of the Gulf Stream approaches close to the reefs in southerly winds the bottom can sometimes be seen in 10 fathoms water.

When approaching the Bahama Banks along the Straits of Florida* the discolored water is the best indication the mariner has to warn him of shoal water; the 100-fathom curve at some points is only 1 or 2 miles from the shoal water of the banks.

The Straits of Florida commence in about latitude 27° 25′ N., between the Little Bahama Bank and the east coast of Florida; thence they sweep around southward and westward to the Dry Tortugas, a distance of about 300 miles. They are included between the Florida coast and its outlying keys and reefs on the west and north, and the Bahama Banks, Salt Key Bank, and the coast of Cuba on the east and south. Their width is variable, the following being the narrower portions: Jupiter Inlet to Little Bahama Bank, 48 miles, greatest depth about 500 fathoms; Fowey Rocks to Great Bahama Bank, 41 miles, greatest depth about 480 fathoms; Tennessee Reef to Salt Key Bank, 47 miles, greatest depth about 500 fathoms. Westward of Salt Key Bank the Straits have a nearly uniform width of about 80 miles, and a depth in places of about 1,000 fathoms.

The great velocity of the Gulf Stream and the closeness to which it at times approaches the reefs and banks render the navigation of these Straits, by sailing vessels bound to the south and west, both tedious and dangerous, and the difficulties are enhanced by the want of convenient anchorages and by the abrupt rise of the banks and reefs from very deep water, which prevents the lead from giving warning of the proximity of danger until it may be too near to be avoided. This combination of unfavorable conditions induces sailing vessels bound to the south and west to avoid the Straits as far as possible by entering through the Providence Channels, and if of sufficiently light draft, crossing the great Bahama Bank. Bound northward, the strong current is so greatly in their favor as to more than counterbalance the difficulties of navigation. The navigation of the Straits has been greatly facilitated by the establishment of lights and numerous beacons along the Florida Reefs (see table, pages 24–27). By the aid of these, steamers, or sailing vessels if they have a leading wind, bound southward, may skirt the reefs in safety sufficiently close to partly avoid the adverse current, and often finding a favorable eddy after passing Alligator Reef. Vessels drawing less than 10 feet, when down to Cape Florida, may pass inside the reefs and follow the Hawk Channel (see description) to Key West, thus avoiding the adverse current of the Gulf Stream in a most dangerous part of the Straits, and finding comparatively smooth water with all winds.

The Straits of Florida lie within the region of the northeast trades, but these winds do not blow over the Straits with the same regularity as over the open ocean. The prevailing winds are from the eastward, however, during the entire year—from the southward of east in summer, and from the northward of east in winter. During the hurricane months "the Straits are liable to be swept by terrific cyclones." As a rule the progressive motion of these storms, in this latitude, is westward and northward. They are most liable to occur during the months of July, August, September, and October. In the winter heavy northers are frequent. They blow generally from northwest to north, hauling, as a rule, northward and eastward, and rarely backing. Their approach is nearly always heralded by a heavy bank of clouds in the northwest, preceded by light airs from the contrary direction, and accompanied by a falling barometer; they commence with a violent squall, gradually settling to a fresh gale. Vessels caught in the narrower parts of the Straits in these gales are subject to a most trying sea. Southeast gales occur at intervals also during the winter. They usually commence to blow at about **ENE.** freshening rapidly with a falling barometer and rising thermometer, and, hauling southward and eastward, obtain their greatest force at about southeast.

Coast and Tidal Currents.—Strong currents set along the coast and close inshore between Chesapeake Entrance and Cape Hatteras in southerly or northerly gales. These currents are a special source of danger to vessels bound southward, hugging the coast to keep out of the Gulf Stream in southeasterly gales. Their strength and set depends much on the direction, strength, and duration of the gale, and during heavy gales has been estimated as high as 3 or 4 knots per hour. Their set in a southeaster is more or less in toward the shore.

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*General remarks and directions for approaching the Straits of Florida by the NW. Providence Channel are given in the latter part of this volume.

Against this danger, whether coasting from cape to cape or attempting to round Hatteras from any direction, the navigator should be on his guard. Across Hatteras Shoals, in ordinary weather, the current of the flood tide sets westward and the ebb eastward with a velocity of from 1 to 2 knots per hour. In heavy gales the currents set with the wind across the shoals with great velocity.

Along the coast, except in the immediate vicinity of the inlets and sounds, between Cape Hatteras and St. Johns River entrance the flood current has a noticeable set westward and southward and the ebb eastward and northward when uninfluenced by the winds; a moderate breeze continued for a considerable time will entirely neutralize any surface indications of ebb and flood. In the vicinity of the larger sounds and harbors the tidal currents are very marked. During gales the currents set across the shoals off Cape Lookout and Cape Fear with great velocity and in the general direction of the wind. When uninfluenced by the wind the flood sets westward and ebb eastward across the shoals with a velocity of 1 to 2 knots per hour.

Southward of St. Johns River entrance the currents close along shore are greatly influenced by the wind, and sometimes there is a current, counter to that of the Gulf Stream, setting close inshore just outside of the Florida Reefs. In strong easterly gales the current of the Gulf Stream sometimes sets close inshore northward of Fowey Rocks and over the shoals off Cape Canaveral. Vessels standing southward along the Florida Reefs should be careful not to run too close to the reefs in the endeavor to keep out of the current of the Gulf Stream.

The Gulf Stream sets eastward and northward through the Straits of Florida, and after passing between Fowey Rocks and Little Bahama Bank it continues for some distance northward and then northeastward, its axis following the general direction of the 100-fathom curve, and from 10 to 20 miles eastward of it.*

Much has been written about the width, velocity of the current, temperature, and other characteristics of the Gulf Stream, based mostly upon the results of desultory examinations, many of which have not proven reliable when compared with the results of systematic observations.

To obtain more knowledge of the Gulf Stream, observations at various periods between the years 1845 and 1892 were conducted by the United States Coast and Geodetic Survey; the following are extracts from a report upon the Gulf Stream by Lieut. J. E. Pillsbury, U. S. N., Assistant, Coast and Geodetic Survey, who commanded the United States Coast and Geodetic Survey steamer *Blake* while engaged in the investigation of the Gulf Stream from 1885 to 1889, both inclusive. The report is published as Appendix 10 in the United States Coast and Geodetic Survey Report for 1890.

"Passing through the Straits of Florida, the axis of the stream off Habana is nearest the southern edge of the current prism, but after making the bend between Salt Key Bank and Florida Reefs the axis is from 4¼ to 11½ miles outside the 100-fathom curve on the west side. There is another body of water to the northward of the West Indian Islands, which, driven by the trade winds, is moving to the westward. This is a slow current, but when it joins the Gulf Stream proper off the southern Atlantic coast of the United States it materially adds to the latter on its way toward the northern seas.

The width of the Gulf Stream off Cape Hatteras is about the same as when it leaves the Straits of Florida. It is, however, liable to more fluctuations in directions, particularly along its edges; and in its progress to the eastward, by the time the Newfoundland banks are reached, it is probable that these fluctuations entirely obliterate the Stream as a body distinguishable from its mate which has come by the outside passage from the trade region. In these latitudes, however (about 40° N.), the whole surface is slowly moving to the eastward, driven by the prevailing westerly winds. Approaching the shores of Europe it meets the obstruction of the Continent and escapes laterally, one branch to the southward from the Azores toward the coast of Africa; the other branch into the Arctic, where it forces a cold return surface current to escape along the shores of Greenland and Labrador.

The characteristics of the Gulf Stream and of also what may be called its tributaries are as follows: When the flow is in the vicinity of the land there is a marked daily variation in the velocity, caused by the elevation or depression due to the attraction of the moon and

* The approximate position of the axis of the Gulf Stream is shown on Charts B and 1001.

sun. There is a retardation in the effect produced by this tidal influence of about three hours. In the open sea the daily variation is not marked. * * *

There is reason to believe, and indeed the proof is positive, that the current flowing along our coast is divided into warm and cold bands. At two anchorages, † Nos. 4 and 5, the vessel happened to be placed at points where the fluctuations in temperature were excessive. A study of the relations existing between the directions of their currents and the temperatures at these stations, together with the position of the moon, seems to confirm the truth of the theory of the movement of the Stream to the right and left. The moon at Station 4 was 16 hours after passing its highest northern declination. At Station 5 it was 2 days before reaching zero. Both anchorages were in the year 1889, the first on May 4th and 5th and the second May 9th and 10th. It has been stated that at that high declination the direction of the current at the sides is more nearly parallel to the general direction of the flow than at low declination, and this is more marked in the subcurrents than on the surface. * * *

I am convinced that the so-called "Cold Wall" is not the inner edge of the Stream, but is near the dividing line between the Gulf Stream proper and the outside Atlantic current, and that the maximum velocity will always be found some miles inside (to the northward) of it. The current outside the Stream is not comparable with the latter in point of velocity. Its speed probably is never much over one knot and usually much less. Its direction is to the northward and westward outside the Bahamas and to the northward and eastward off Cape Hatteras. * * * So much has been written on the question in times past, and the belief is so widespread at the present day, that the thermometer may be relied upon to indicate the presence of a current, that I wish to particularly accentuate the fallacy of the idea. In the Straits of Florida we have found that the highest average temperature is at the axis of the Stream, but there are times during the month when the sides are warmer than the axis was at some other recent time. Isolated observations are of but little value, for at the same place the variations are great even in an interval of a few days or perhaps hours. All we can say positively is that cold surface water comes from either a polar direction or from a lower stratum. The direction of its flow may be toward any point in the compass.

I can see no way of utilizing the thermometer for the purposes of accurate navigation, nor, indeed, of using it to indicate with certainty that the current is favorable or the reverse. * * *

The inner edge of the Stream, then, is not necessarily marked by a change of temperature. An abrupt difference may be encountered at the true edge of the current, the cold water may be moving northeast or the warm water may be flowing southwest. It is probable, however, that at about the time of high declination warm water off Cape Hatteras indicates a northeast current, and that at low declination the edge of the warm water has a set in the opposite direction.

It is probable that from Jupiter Inlet to Cape Hatteras the average position of the maximum current will be found between 11 and 20 miles outside the curve of 100 fathoms depth, disregarding the irregularities in the curve.

To gain the advantage of the strongest current, it is a question of judgment to be decided by the navigator at the time, how much he shall cut off in rounding the bends of the Stream. At high declination he can edge out so as to pass Fowey Rocks Lighthouse, 7 miles distant, and be sure of a good current, while at low declination the maximum velocity at this distance will be found much less, and it will be necessary to go 4 or 5 miles farther to the eastward.

The data obtained off Cape Hatteras are not sufficient to enable us to assert positively how much the movement of the axis is. The width of the Stream at high declination is about 40 miles, reckoning from the 100-fathom curve, which is about the same width as in the narrowest part of the Straits of Florida. It is probable that at low declination the position of the axis at Cape Hatteras is not more than 12 or 15 miles farther offshore than the distance given in the table (see page 36), but the conditions of the current outside the Stream at this point cause a slow surface flow at times which may lead to the belief that the Stream itself is very broad.

† Stations Nos. 4 and 5 were about 53 and 65 miles respectively SE. ⅜ S. (magnetic) from Hatteras Lighthouse.

A steamer bound from Cape Hatteras to Habana or the Gulf ports crosses the Stream off Cape Hatteras. A fair allowance to make in crossing the Stream at right angles is 1½ knots per hour for a vessel's speed of 5 knots for a distance of 40 miles from the 100-fathom curve. In the run from the southern edge of the Stream to Matanilla Shoal no allowance for current can be given. Upon sighting the Bahama Bank, time will be saved by running down the Stream on the east side as far as Gun Cay instead of crossing at Jupiter and running the latitude down on the Florida side of the channel. The current is weak on the Bahama side, and on the shoals there is practically none. This route will be difficult and perhaps impracticable until a lighthouse is built at Matanilla, unless the green water of the northwest corner of the bank is sighted before dark. Arriving at Gun Cay, Bahama, an allowance of 2¼ knots per hour for speed of the vessel of 5 knots per hour will make a course of west good to Fowey Rocks. This is for the average velocity of the Stream. The weakest current will be experienced about 3 hours before the transit of the moon, and if the crossing is made so as to arrive at the axis at about this hour time will be saved.

A vessel running inside the Stream from Cape Hatteras to Cape Canaveral should keep inside the 100-fathom curve, and, after passing the latter cape, as close to the Florida shore as prudence will allow.

Along the Florida Reefs the neutral zone which borders the northern edge of the Stream probably begins in the vicinity of "The Elbow," near Carysfort Reef Lighthouse, and gradually widens as the longitude increases, until off Rebecca Shoal, it extends from 15 to 20 miles outside the 100-fathom curve. It is narrowest at high declination of the moon, at which time it probably begins at some point to the westward of "The Elbow." The direction of the current in this zone is ordinarily tidal in its character, but it is easily overcome by an abnormal current caused by differences in atmospheric pressure within and without the Gulf of Mexico.

Crossing the Stream from Habana, a fair allowance for the average current between 100-fathom curves, is 1$\frac{1}{10}$ knots per hour for a 5-knot speed of vessel.

The following table gives the position of the axis or the point where the greatest velocity may be found on the third day after the moon's highest and after zero declination. The *velocity* of the current at the point given as the position of the axis at high declination, changes more than at the other point; or in other words, the difference between the maximum and the minimum currents during the month is greatest near the place where the movement to the left ceases. At the mean position of the axis, however, a good current is always to be found.

	High declination.	Low declination.	Mean position.
	Miles.	*Miles.*	*Miles.*
East of Contoy Island, Yucatan	25	45	35
North of Habana, Cuba	16	34	25
East of Fowey Rocks, Florida	7	15	11
East of Jupiter Lighthouse, Florida	15	23	19
Southeast of Cape Hatteras Lighthouse	31	----------	----------

The following tables show the maximum daily variation observed at various stations, the mean daily variation and the velocity of the surface flow. In the Straits of Florida, off Cape Florida, there is but one prominent maximum each day, usually arriving nine hours before the upper transit of the moon.

Between Fowey Rocks, Florida, and Gun Cay, Bahama.

Station.	Distance east of Fowey Rocks.	Mean surface velocity observed.	Maximum daily variation observed.	Mean daily variation.
	Miles.	*Knots.*	*Knots.*	*Knots.*
1	8	2.66	2.38	1.07
1½	11½	3.46	1.83	1.64
2	15	3.16	1.67	0.92
3	22	2.73	0.56	----------
4	29	2.12	0.58	0.42
5	36	1.71	0.95	0.55

The surface directions of the currents at the extreme stations incline toward the center of the stream at low declination of the moon and run more nearly parallel with the axis at high declination.

Between Rebecca Shoal Lighthouse, Florida, and Cuba, near Habana.

Station.	Distance south of Rebecca Shoal.	Mean surface velocity observed.	Greatest daily variation observed.	Mean daily variation.
	Miles.	*Knots.*	*Knots.*	*Knots.*
1	20	0.30	0.62	0.49
2	35	0.74	1.15	0.77
3	50	2.24	0.60	0.62
4	68	2.23	0.80	0.46
5	86	0.77	0.82	0.61

SAILING DIRECTIONS, CHESAPEAKE ENTRANCE TO KEY WEST.

The routes taken by vessels bound to the southward will, of course, depend greatly upon their port of destination. The directions for coasting are given in sections as follows:

Section 1. From Cape Henry to Cape Hatteras.

Section 2. From Cape Hatteras to Martins Industry Light-vessel.

Par. I. For vessels of any draft.

Par. II. For vessels of 18 feet or less draft.

Par. III. From Hatteras to St. Johns River—straight track.

Section 3. From Martins Industry Light-vessel to Cape Canaveral.

Section 4. From Cape Canaveral to Fowey Rocks.

Section 5. From Fowey Rocks to Alligator Reef Lighthouse.

Section 6. From Alligator Reef Lighthouse to Key West Harbor Entrance or to Rebecca Shoal Lighthouse.

Offshore routes for vessels bound from Cape Hatteras to Key West or Gulf Ports, are given under the heading "Steamship Routes for vessels bound from Cape Hatteras to the Gulf of Mexico."

Directions for entering the Straits of Florida from the eastward are given under the heading "General Remarks and Sailing Directions for Entering the Straits of Florida through the Providence Channels."

1. ***From Cape Henry to Cape Hatteras.—For vessels of any draft.***—With Cape Henry Lighthouse bearing **W.** distant 4 miles, make good a **S.** by **E.** ¾ **E.** course for 76 miles, and then change the course to **S.** ¼ **W.** and continue it 40 miles; Diamond Shoal Light-vessel should then be close aboard, and Cape Hatteras Lighthouse should bear **NW.** distant 15 miles. Or, with strong westerly or northwesterly winds, having Cape Henry Lighthouse bearing **W.** distant 4 miles, make good a **S.** by **E.** ½ **E.** course for 76 miles. Then steer **S.** ½ **W.** taking care to pass at least 7½ miles eastward of Cape Hatteras Lighthouse. Having made this course good for 41 miles, Cape Hatteras Lighthouse should bear **NNW.** ½ **W.** distant nearly 13 miles. From this position follow the directions in section 2, or, the sailing directions on page 44.

Remarks.—Notice the remarks on currents on pages 33, 34. The **S.** by **E.** ¾ **E.** course draws offshore gradually and passes well eastward of all dangers. Currituck Beach Lighthouse is left 9 miles distant when abeam and Bodie Island Lighthouse nearly 10½ miles. When the course is changed to **S.** ¼ **W.** Bodie Island Light, if visible, should bear **WNW.** ¼ **W.**

The **S.** ¼ **W.** course leads from 8½ to 9½ miles from shore, and, directly for Diamond Shoal Light-vessel. At night after having stood on this course for 15 miles Hatteras Light should be made bearing about **SW.** ½ **S.**, and it should be 10 miles distant when abeam, bearing **W.** ¼ **N.** Diamond Shoal Light-vessel may drag her moorings in very heavy gales, and is therefore liable to be several miles away from the position here given, or the position indicated on charts. Vessels rounding Hatteras Shoals should, if possible, check their position by the lighthouse, and should never fail to use the lead at frequent intervals. (See also pages 33, 34.)

The **S.** by **E.** ¼ **E.** course leads outside of all dangers and from 4½ to 8½ miles from shore. Currituck Beach Light and Bodie Island Light should each be about 8 miles distant when abeam.

When the course is changed to **S.** ½ **W.** Bodie Island Light should bear **NW.** by **W.** ¾ **W.** distant 10 miles; Wimble Shoal is left a little over 1 mile on the starboard hand. Cape Hatteras Light and Beacon Light should be at least 7 miles distant when abeam, so as to give Hatteras Shoals a berth of 1½ miles. When Hatteras Light bears **NNW.** ½ **W.** the vessel should be in 20 to 30 fathoms of water and on the sailing line from Cape Hatteras to Frying Pan Shoals Light-vessel as given in section 2 following.

When rounding Hatteras Shoals the lead should always be used. In thick weather the water should not be shoaled to less than 20 fathoms, and in clear weather to not less than 12 fathoms.

Dangers.—There are several spots with 14 to 18 feet of water over them lying from ¾ to 1¾ miles from the beach off **False Cape**, the name given to that part of the shore 20½ miles southward of Cape Henry Lighthouse. Vessels must pass outside of these shoals.

Platt Shoals consist of a number of spots with 4½ to 6 fathoms over them, lying from 2¼ to 3¾ miles from the beach, and from 6 to 9 miles southeastward of Bodie Island Lighthouse. There is a good channel with a depth of 8 to 14 fathoms inside this shoal and about 1⅜ miles from the beach. The shoals extend about 3½ miles in a general **NNW.** and **SSE.** direction and are about 1½ miles wide. In easterly gales the shoaler spots of these shoals are marked by breakers.

Wimble Shoals consist of a number of ridges extending out from and lying off the shore to a distance of 4 miles with depths ranging from 3½ to 6 fathoms. The northern end of these shoals is about 13½ miles southward of Bodie Island Lighthouse and bears **E.** by **S.** from the northern end of the Chickamicomico Woods. The spot with 3½ fathoms over it lies about 2⅝ miles from the shore, and there are several spots with 4 fathoms over them inshore of it. In easterly gales the shoaler parts are marked by breakers.

Hatteras Shoals extend nearly 8 miles in a southeasterly direction from the pitch of Cape Hatteras, and consist of a number of irregular shoals, some of which have only 4 and 6 feet of water on their shoaler parts. The three principal shoals have distinctive names. **The Spit** extends about 2 miles southeastward from the pitch of the cape and has depths of 6 to 12 feet over it.

Diamond Shoal lies 3 miles southeastward of the cape, has a least depth of 4 feet over it, and is usually marked by breakers. **Outer Shoals** consists of two large irregular patches with least depths of 5 and 8 feet over them and usually marked by breakers and a wreck or two; the one lying farthest offshore bears **SE.** by **S.** distant 8½ miles from Hatteras Lighthouse. Between Outer and Diamond Shoals is what is known as the **Outer Slue Channel**, which has a depth of about 3½ fathoms, but as there are several spots with only 14 and 16 feet of water over them, and as the channel is not marked, it is not safe to pass north of the Outer Shoals. During strong winds the currents set across the shoals with great velocity, and sailing vessels must be cautious when rounding not to be set on them. (See remarks on currents on pages 33, 34.)

Diamond Shoal Light-vessel (see table page 12) is moored about 15 miles **SE.** ⅝ **E.** from Cape Hatteras Lighthouse, and is the leading mark for all vessels rounding Hatteras Shoals. This light-vessel is, however, liable to drag her moorings in heavy gales.

2. ***From Cape Hatteras to Martins Industry Light-vessel.***—*I. For vessels of any draft.*—Having followed the directions in section 1 preceding, with Cape Hatteras Lighthouse bearing **NW.** distant 15 miles, make good a **SW.** ¾ **W.** course for 69 miles. Cape Lookout Lighthouse should then bear **NNW.** ¼ **W.** and be distant 17 miles. Then make good a **SW.** by **W.** course for 88 miles, when Frying Pan Shoals Light-vessel should be about 3 miles distant on the starboard beam. From this position make good a **SW.** by **W.** ⅛ **W.** course for 166 miles. Martins Industry Light-vessel should then be about 3 miles distant on the starboard hand and the directions in section 3 should be followed.

A **SW.** by **W.** ½ **W.** course made good for 108 miles from Frying Pan Shoals Light-vessel will lead to a position 6 miles eastward of Charleston Light-vessel.

II. ***With westerly or northwesterly winds, for vessels of 18 feet or less draft.***—With Cape Hatteras Lighthouse bearing **NNW.** ½ **W.** distant about 13 miles, make good a **SW.** ⅞ **W.** course for 151 miles. Or, from Diamond Shoal Light-vessel, or, with Cape Hatteras Lighthouse bearing **NW.** distant 15 miles, make good a **SW.** ⅞ **W. Westerly** course for 155½ miles. Frying Pan Shoals Light-vessel should then be abeam distant 3 miles; Cape Lookout Lighthouse will be left 13 miles on the starboard hand on this course. From off Frying Pan Shoals Light-vessel a **SW.** by **W.** ¼ **W.** course made good for 165 miles will lead to Martins Industry Light-vessel; or, a **SW.** by **W.** ⅛ **W.** course made good for 108 miles will lead to a position 6 miles to the eastward of Charleston Light-vessel.

III. ***To make a straight track from Cape Hatteras to St. Johns River entrance.***—A **SW.** ¼ **W. Westerly** course made good for 417 miles from Diamond Shoal Light-vessel, should

lead up to the whistling buoy off the entrance to St. Johns River. This course leads well clear of all dangers and no lights or land will be sighted until nearly up to the entrance to the river.

Remarks.—See the remarks on coast currents on page 33. The **SW. ¾ W.** course should lead 3 miles outside of the 4¾-fathom spot off Cape Lookout Shoals. In passing Cape Lookout Shoals it is advisable to use the lead and pass outside the shoals in 13 fathoms of water. Cape Lookout Light will not be sighted unless on a very clear night.

On the **SW.** by **W.** course Frying Pan Shoals Light-vessel should be made on the starboard bow. In thick weather the lead should be used as the light-vessel is approached and the water not shoaled to less than 7 or 8 fathoms.

The **SW.** by **W. ⅛ W.** course from Frying Pan Shoals Light-vessel leads well outside of all dangers with depths of 8 to 14 fathoms. Cape Romain Light should be 16 miles, Charleston Light-vessel 11 miles, Charleston Light 14 miles, and Hunting Island Light 13½ miles distant when abeam, but they will only be visible at night. Martins Industry Light-vessel should be made on the starboard bow.

The **SW. ⅞ W. Westerly** course from Cape Hatteras, when off Cape Lookout, passes between two spots having from 4¾ to 6 fathoms over them and about 13 miles southeastward of Cape Lookout Lighthouse; at night bearings should be taken of the light so as to pass it at that distance when abeam. Frying Pan Shoals Light-vessel should be made on the starboard bow, but Cape Fear Light will not be visible unless the vessel is so far to the westward of the track as to place her in danger of running on the shoals.

On the **SW.** by **W. ½ W.** course from Frying Pan Shoals Light-vessel, Georgetown Light should be about 17 miles distant and Cape Romain and Bull Bay lighthouses 11 miles distant when abeam. Charleston Light-vessel should be made on the starboard bow. Deep-draft vessels should be careful to pass well eastward of Cape Romain on account of the shoal water off the cape.

Dangers.—**Cape Lookout Shoals** extend in a general **SSE.** direction 8¼ miles from the pitch of the cape, their outer end, with a depth of less than 18 feet, being **S.** by **E.** distant 10 miles from Cape Lookout Lighthouse. The greatest width of the shoals is about 1¾ miles and the depth over them ranges from 2 to 18 feet. **Lookout Breakers** is the name given to a ridge on the shoals which has a depth of 2 to 6 feet, and lies about 7 miles from the lighthouse and 3 miles from the southern end of the shoals. Outside of Lookout Shoals proper are two irregular shoals with 4¾ to 6 fathoms over them. These shoals may be dangerous in a heavy sea, and deep-draft vessels should pass at least 14½ miles from Cape Lookout Lighthouse when it bears **NNW. ½ W.** to clear these outer shoals. In thick weather always use the lead, and, unless very sure of the vessel's position, do not go into a less depth than 14 fathoms. (See also the remarks on currents on pages 33, 34.)

Frying Pan Shoals.—The unbroken part of these shoals extends in a general **S.** by **E. ¾ E.** direction for a distance of 10 miles from the pitch of Cape Fear, and has a depth of 7 to 14 feet over it; for a distance of 5½ miles farther in the same general direction the shoals are broken, the depth over them ranging from 10 to 24 feet. The greatest width of the shoals is about 2¼ miles. About midway between the pitch of the cape and the outer shoal is what is known as the **Blue Channel.** This has a depth of 11 feet at low water, and is sometimes used by light-draft coasting vessels in smooth weather. The channel is marked by a buoy at its eastern and a buoy at its western end. **Frying Pan Shoals Light-vessel** is moored off the outer end of the shoal, and bears **SSE.** nearly 17 miles from the pitch of the cape. Frying Pan Shoals whistling buoy is off the western side of the shoals and bears **NW. ¼ W.** distant nearly 8 miles from the light-vessel. The buoy is a guide for vessels bound to the Cape Fear River after rounding the light-vessel. About 9 miles **ESE. ⅞ E.** from Frying Pan Shoals Light-vessel, is a small shoal with a least depth of 4¾ fathoms over it. Frying Pan Shoals are especially dangerous, on account of their distance from the land and the strong tidal currents which set across them in strong winds. (See also the remarks on currents on pages 33, 34.)

The shoals which make off from the shore from abreast Winyah Bay to Port Royal Sound are described under the directions for vessels standing in for the harbors. Off Cape Romain there are spots with 25 and 30 feet of water over them lying 9 and 14 miles from the lighthouse; spots with 30 feet of water will be found about 8 miles eastward of Charleston Light-vessel and eastward of St. Helena Sound.

3. ***From Martins Industry Light-vessel to Cape Canaveral.—For vessels of any draft.***—Having followed the directions in section 2 until Martins Industry Light-vessel bears about **NW.** distant 3 miles, steer **SSW. Southerly**; this course made good for 108 miles should lead to a position from which St. Johns River Lighthouse bears **W.** distant about 6 miles. Then make good a **SSE. ⅝ E.** course for 121 miles; Cape Canaveral Light should then bear **SW.** by **W. ½ W.** distant about 13½ miles. From this position follow the directions in section 4 following.

Remarks.—The **SSW. Southerly** course leads well offshore, and no land will be sighted until near the mouth of the St. Johns River when **Mount Cornelia,** a hill 63 feet high, thickly wooded, may be seen. St. Johns River Lighthouse should be made broad off the starboard bow, and when it bears **W.** the whistling buoy, off the entrance of the river, should be about 2¼ miles distant and nearly in range with Mount Cornelia. At night

after having lost sight of Tybee Light the first light which should be sighted is Amelia Island Light, and when it bears a little abaft the starboard beam St. Johns River Light should be sighted.

On the **SSE. ⅜ E.** course the sailing line draws offshore gradually, St. Augustine Lighthouse is left 12 miles distant when abeam, and Mosquito Inlet Lighthouse 16 miles. Hetzel Shoal whistling buoy should be left about 1¾ miles on the starboard hand and Cape Canaveral Lighthouse, when abeam, should be 13½ miles distant.

When approaching the shoals off Cape Canaveral soundings should be taken frequently, and the vessel should be kept in nothing less than 12 fathoms of water until the whistling buoy off Hetzel Shoal is sighted.

Dangers.—All the shoals making offshore between Martins Industry Light-vessel and Fernandina Entrance can be avoided by giving the shore a berth of over 9 miles. These shoals are described in connection with the harbor entrances.

A narrow shoal with 5¼ to 6 fathoms over it lies from 5 to 5¾ miles from the shore and from 20 to 22 miles southeastward from St. Johns River Lighthouse. This shoal is only dangerous to deep-draft vessels in easterly gales, and such vessels should not approach the shore closer than 6½ miles.

There are **a number of outlying shoals** within a radius of 13 miles northward and northeastward of Cape Canaveral Lighthouse. In a heavy sea these shoals are marked by breakers, but with a smooth sea there is nothing to indicate their locality except the buoys marking Hetzel and Ohio shoals, the land usually not being visible from off the outer shoals. (See also the remarks on currents on pages 33, 34.)

Hetzel Shoal lies **E.** by **N.** distant 9 miles from False Cape and 11¾ miles **NNE. ⅞ E.** from Cape Canaveral Lighthouse. The part of the shoal having less than 6 fathoms over it extends 5 miles in a general **NNW.** and **SSE.** direction, and the shoaler part, with 11 to 17 feet of water over it, extends about 1 mile in a **N.** and **S.** direction, and is about ¼ mile wide. Nearly 1½ miles **NE.** from the **N.** end of Hetzel Shoal and **NNE. ⅞ E.** nearly 13½ miles from Cape Canaveral Lighthouse is a red whistling buoy in about 11 fathoms water.

Ohio Shoal has 3¼ fathoms of water over it and lies about 1¼ miles southeastward of the shoalest part of Hetzel Shoal, and there is from 3½ to 4½ fathoms between these shoals. A black can buoy marks Ohio Shoal; it lies 2⅝ miles **S. ¾ E.** from the whistling buoy on Hetzel Shoal.

Chester Shoal is the name given to an extensive shoal with depths ranging from 9 to 20 feet over it, and lying eastward and southeastward from False Cape. The easternmost part of this shoal is 4½ miles from the beach, and has a depth of ess than 4 fathoms over it. About 4¼ miles from the beach, and bearing **NE.** by **E.** from False Cape, is a small shoal with 19 to 24 feet of water over it.

Lying about 5 miles offshore, and 6½ miles **NE.** by **N.** from Cape Canaveral, is **a shoal** with 16 to 24 feet of water over it. This shoal is about 1 mile long **NE.** and **SW.** and nearly ½ mile wide; the depth between it and the southeastern end of Chester Shoal is from 4½ to 5½ fathoms.

The Bull, a narrow shoal with 16 to 24 feet of water over it, lies 7¼ miles **NE.** by **E.** from Cape Canaveral Lighthouse. The shoal is about 2¼ miles long in a **N.** and **S.** direction, and nearly ½ mile wide. About 1½ miles northward of the shoalest part of The Bull are two 5-fathom spots.

Between Hetzel and Ohio shoals on the east, and Chester Shoal, The Bull, and other shoals on the west, there is a channel with a least width of 2¼ miles and depth of over 5 fathoms.

Southeast Shoal is an extensive shoal making off southeastward from Cape Canaveral, its outer end being 6½ miles from the cape The main part of the shoal, with from 5 to 14 feet over it, makes out 5½ miles in a **SE.** by **E.** direction, and is almost constantly marked by breakers. The outermost shoal spot lies 1½ miles farther out in the same direction, and has a least depth of 11 feet over it. This spot is nearly 1 mile long in a **N.** by **E.** and **S.** by **W.** direction and about ¼ mile wide, with a depth of less than 19 feet. Between it and the main part of the shoal is **Canaveral Slue,** which is about 1¼ miles wide, with a least depth of 21 feet in one place. A black and white perpendicularly striped buoy marks the channel through the slue, and it should be left close-to by vessels using this channel.

4. ***From Cape Canaveral to Fowey Rocks.—For vessels of any draft.***—Having followed the directions in section 3 preceding, when Cape Canaveral Lighthouse bears **SW.** by **W. ½ W.** distant 13½ miles, and the whistling buoy off Hetzel Shoal has been left about 7 miles on the starboard quarter, make good a **S.** by **E. ⅛ E.** course for a distance of 97 miles. Jupiter Inlet Lighthouse should then bear about **W.** by **S.** (abeam) distant 6 miles. From this position a **S. ¼ W.** course made good for 83½ miles will lead to a position 1 to 2 miles eastward of Fowey Rocks Lighthouse; then follow the directions in section 5.

Or, to keep out of the Gulf Stream current; while still 5 miles northward of Jupiter Inlet Lighthouse, haul inshore and follow the coast, taking care to avoid the wreck which lies 3¼ miles **ESE.** from Jupiter Lighthouse; keep about 1¼ miles from the beach, and in a depth of over 10 fathoms, until Biscayne Shoal buoy is abeam distant ½ mile. From this position a **S. ¼ E.** course should be made good, passing ¾ mile eastward of North end of Florida Reefs beacon and 1 mile eastward of Fowey Rocks Lighthouse.

Remarks.—The **S.** by **E.** ½ **E.** course draws inshore gradually, and passes outside of all dangers. The land will not be sighted until nearly abreast of Jupiter Lighthouse; 20 miles northward of the lighthouse the sailing line leads 9 miles offshore. Having stood on the course for about 50 miles the vessel should be eastward of the farthest outlying shoal; this shoal has a least depth of 28 feet over it and should be avoided. None of the shoals between Cape Canaveral and Jupiter Inlet are marked, except by breakers during a heavy sea.

The **S.** ¼ **W.** course draws in toward the shore gradually for the first 24 miles, and is then about 2 miles from the beach. It then draws offshore gradually, and when about 15 miles northward of Fowey Rocks Lighthouse the sailing line leads 2 to 3 miles eastward of Biscayne Shoal buoy. North end of Florida Reefs beacon will be left about 2½ miles on the starboard hand on this course. Along this stretch of the coast special attention must be paid to the current, and particularly during strong easterly winds. The shore northward of the Florida Reefs should be given a berth of at least 1¼ miles. See also the remarks on currents on pages 33–37.

Dangers.—**Thomas Shoal** has a least depth of 5 fathoms over it and lies from 5 to 7 miles offshore. The part of the shoal having a less depth than 6 fathoms is about 4 miles long **NW.** by **N.** and **SE.** by **S.**, and lies between 36 and 40 miles southward of Cape Canaveral Lighthouse. About 5 miles **SE.** ½ **E.** from the southern end of Thomas Shoal, and 8 miles from the beach, is a small 5¼-fathom spot.

A narrow shoal with a depth of 28 to 32 feet over it lies about 10 miles offshore about 48 miles southward of Cape Canaveral Lighthouse; this shoal is about 3 miles long in a general **N.** and **S.** direction and its greatest width is about ¾ mile.

Indian River Shoal extends out from the shore about 2 miles northward of Indian River Inlet, which is about 36 miles northward of Jupiter Inlet Lighthouse. The shoal extends out from the shore in a northerly direction and depths of 3¼ to 3¾ fathoms will be found from 2 to 2½ miles from the shore.

Capron Shoal is a small shoal with a least depth of 18 feet over it, lying about 2¾ miles from the shore and about 6 miles southeastward of Indian River Inlet.

Pierce Shoal, a small shoal about 5 miles southward of Capron Shoal, has a least depth of 3¼ fathoms over it and lies about 1¾ miles from the shore.

St. Lucie Shoal is about 5 miles long in a general **N.** ¾ **E.** and **S.** ¾ **W.** direction; at its southern end, which is 22 miles northward of Jupiter Inlet Lighthouse and 3½ miles from the shore, it has a least depth of 16 feet over it. About 3 miles **N.** by **E.** from this part of the shoal and 5 miles from the shore is a narrow spot with 4 fathoms over it; between these two spots the depth ranges from 4¼ to 6¼ fathoms.

Gilbert Shoal has a depth of 3¼ fathoms over it and lies about 1 mile offshore and 17 miles northward of Jupiter Inlet Lighthouse. The shoal with a less depth than 4 fathoms is about ¾ mile long and extends parallel to the beach.

A wreck, which should be avoided, lies in about 13 fathoms of water about 3¼ miles **ESE.** from Jupiter Lighthouse.

Southward of Hillsboro Inlet, which is about midway between Jupiter Inlet and Fowey Rocks, and until the northern end of the Florida Reefs are encountered, there are no outlying shoals, but less than 18 feet will be found in many places ¾ mile, and 4 fathoms in several places 1 mile from the shore.

Biscayne Shoal has a depth of 17 feet over it and lies nearly 1 mile offshore and 15 miles northward of Fowey Rocks Lighthouse. A red buoy marked "Biscayne" in white letters is placed eastward of the shoal.

The broken line of detached reefs, with 12 to 18 feet of water over them, which extend for a distance of 10 miles in a **N.** ¼ **W.** direction from Fowey Rocks Lighthouse are part of the Florida Reefs. **North end of Florida Reefs,** the name given to the northernmost, is about 1¼ miles long in a **N.** and **S.** direction and 300 yards wide. Off its eastern side is a brown beacon with the letter "W".

5. ***From Fowey Rocks to Alligator Reef Lighthouse.***—In this section and section 6 following, separate directions are given for passing along outside of the Florida Reefs in the daytime and at night. The directions for the daytime lead as close as is consistent with safety under favorable conditions. At night close attention to the red sectors in the lights will insure safety. It must be remembered that during and after strong southerly winds the Gulf Stream current sets close in to the reefs; care must therefore be taken to make the distances good between the points where courses are changed. Sailing vessels in light winds should not run the risk of being becalmed close in to the reefs; it is advisable in case the wind falls light to haul offshore.

In the daytime.—Having followed the directions in section 4, when Fowey Rocks Lighthouse bears **W.** distant about 1 mile steer **S.** ¾ **W.** for 7 miles. Beacon "**O**", on Triumph Reef, should then bear about 1 point abaft the starboard beam distant a little over ¾ mile. Then steer **S.** by **W.** for 6½ miles; Beacon "**L**", on Pacific Reef, should then be about ¾

mile distant on the starboard beam and the course changed to **S.** by **W.** ¾ **W.** for 10 miles, when Carysfort Reef Lighthouse should be 1 mile distant and on the starboard beam. Then steer **SSW.** ½ **W.** for 5¾ miles and when Beacon "**J**", on "The Elbow", bears abeam distant 1 mile, steer **SW.** ¾ **S.** for 10 miles. Beacon "**T**", on Molasses Reef, should then be on the starboard beam distant 1 mile. From this position make good a **SW.** ¾ **W. Southerly** course for 16½ miles or until Alligator Reef Lighthouse bears **NW.** ½ **N.** distant nearly 1 mile and then be guided by the directions in section 6 following.

At Night.—Having followed the directions in section 4, when Fowey Rocks Light bears **W.** distant about 1 mile, steer **S.** ¼ **W.** for nearly 11½ miles, taking care to keep in the white rays of Fowey Rocks Light for that distance and until Carysfort Reef Light shows white, then being in the white rays of both lights, steer **SSW.** ⅛ **W.**; this course made good leads 1 mile southeastward of Carysfort Reef Light; when the light is abeam distant 1 mile steer **SSW.** ½ **W. Southerly** and keep in the white rays as long as the light is visible. Having stood on this course for 16½ miles the white rays of the Alligator Reef Light should be made, and the course changed to **SW.** ⅞ **W.**; continue on this course, keeping in the white rays of Alligator Reef Light for 16¼ miles and until Alligator Reef Light is abeam distant nearly 2¼ miles, then follow the directions in section 6.

Remarks.—In the daytime while on the **S.** ¼ **W.** course the reefs will be left about ¾ mile on the starboard hand and not less than 25 fathoms will be found on the sailing line. On the **S.** by **W.** course about 30 fathoms is the least water on the sailing line and the reefs and Beacon "**M**" (on Ajax Reef) are left ¾ mile on the starboard hand. On the **S.** by **W.** ¾ **W.** course the entrance buoy to Turtle Harbor is left about ¼ mile on the starboard hand while nearly 5 miles northeastward of Carysfort Reef Lighthouse. The **SSW.** ½ **W.** course leads well clear of the reefs in a least depth of about 14 fathoms; Beacon "**J**" should be made well off the starboard bow and be left nearly 1 mile distant when abeam. On the **SW.** ¾ **S.** course the least depth should be about 18 fathoms, and Beacon "**G**" and Beacon "**T**" when abeam should be distant about 1 mile. There are three beacons (Beacon "**F**" on Pickles Reef, Beacon "**E**" on Conch Reef, and Beacon "**D**" on Crockers Reef) marking the reefs between Molasses Reef beacon and Alligator Reef Lighthouse; and in no case should they be passed closer than ¾ mile while on the **SW.** ¾ **W. Southerly** course. The least water on this course should be not less than 9 fathoms and the average depth about 20 fathoms.

Note.—A detailed description of the reefs in connection with the sailing directions would only be confusing. While skirting the reefs in the daytime a sharp lookout should be kept for the beacons and other aids, and the color of the water should be noted. The position of the vessel should frequently be verified by bearings on the beacons and lighthouses, and the aids should not be passed closer than the distances stated in the sailing directions and remarks.

6. ***From Alligator Reef Lighthouse to Key West Harbor Entrance or to Rebecca Shoal Lighthouse.—For vessels of any draft.***—Having followed the directions for the daytime in section 5 and having Alligator Reef Lighthouse distant nearly 1 mile on the starboard beam, continue on the **SW.** ¾ **W. Southerly** course for 10¾ miles. Tennessee Reef buoy should then be on the starboard beam, distant ½ mile. Then make good a **SW.** by **W.** ¾ **W.** course for 19½ miles (taking care not to be set in toward the reefs), when Sombrero Key Lighthouse should be 1¼ miles distant on the starboard beam. From this position steer **WSW.** ½ **W.** This course continued for 35 miles leads to the entrance of the Southeast Channel into Key West; if continued 4½ miles farther, to the entrance of the Main Ship Channel into Key West; and if this course is made good for a distance of 43¾ miles from Sombrero Key Lighthouse, Sand Key Lighthouse should bear **N.** by **W.** distant 1½ miles, then:

To enter Key West Harbor follow the sailing directions under that heading.

If desiring to pass into the Gulf of Mexico between Rebecca Shoal and the Dry Tortugas. From a position about 1½ miles southward of Sand Key Lighthouse steer **W.** ¼ **S.** for 35 miles and then steer **NW.** ¾ **N.** for 11 miles. Rebecca Shoal Lighthouse should then bear **E.** distant a little over 2 miles.

At night.—Having followed the directions for night in section 5, with Alligator Reef Light abeam distant nearly 2¼ miles, continue the **SW.** ⅞ **W.** course for 14¼ miles. Sombrero Key Light should then show white and the course should be changed to **WSW.** ¼ **W.**

On this course Sombrero Key Light should be left 1 mile on the starboard hand and the vessel should be kept in the white rays of this light. Having stood for 27 miles on the **WSW. ¼ W.** course the vessel should be just entering the white rays of American Shoal Light; the course should then be changed to **WSW. ½ W. Westerly.** Leave American Shoal Light nearly 1⅜ miles on the starboard hand when abeam and when nearly 8½ miles past it and on the edge of its red ray, Sand Key Light will begin to show white. Having stood on the **WSW. ½ W. Westerly** course for 19¾ miles, the vessel should be on the edge of the red ray in Key West Light and off the entrance of the Southeast Channel, which is the one usually used by vessels entering Key West Harbor at night.

To enter Key West Harbor follow the sailing directions under that heading.

If desiring to pass into the Gulf of Mexico between Rebecca Shoal and the Dry Tortugas, continue the **WSW. ½ W. Westerly** course until Sand Key Light bears **N.** by **W.** distant 1¾ miles. Then steer **W. ¼ S.** for 35 miles, taking care to keep in the white rays of Sand Key Light for a distance of 12¾ miles after it has been left abeam. After having stood on this course (**W. ¼ S.**) for 35 miles, Rebecca Shoal Light should bear about **NNW. ¼ W.** and be distant 10 miles, and the course should be changed to **NW. ¾ N.** to pass a little over 2 miles westward of the light.

Remarks.—In the daytime while on the **SW. ¾ W. Southerly** course the depth should not be less than 15 fathoms. Beacon "**7**" (on Tennessee Reef) should be left 1 mile on the starboard hand and Tennessee Reef buoy (nun, red, "Tennessee" in white letters) should be left ½ mile on the starboard beam. On the **SW. by W. ¾ W.** course the depth should not be less than 20 fathoms; the sailing line leads about ¾ mile outside of some of the reefs with 14 to 15 feet of water over them. Beacon "**C**" (on Coffin Patches) should be left at least 1⅜ miles on the starboard hand. Between Tennessee Reef buoy and Sombrero Key Lighthouse there are a number of breaks in the reefs through which a depth of 3½ fathoms can be taken. On the **WSW. ½ W.** course there are no aids for a distance of 17 miles until up to Beacon "**6**" (on Looe Key); for a distance of 12½ miles westward of Sombrero Key Lighthouse the least depths on the reefs are from 17 to 20 feet. Care should be taken not to shoal the water to less than 20 fathoms. Beacon "**6**" should be left about ¾ mile on the starboard hand and American Shoal Lighthouse be passed at the same distance. After passing American Shoal Lighthouse, Beacon "**S**" (on Maryland Shoal) is the first aid passed; Beacon "**A**" (on Eastern Sambo) is about 8 miles westward of the lighthouse. The reefs between beacons "**S**" and "**A**" have little water over them and some show bare. When abreast of Beacon "**A**" the city of Key West and Key West Lighthouse will be seen to the northwestward, and when this lighthouse bears **NW. ¼ N.** Western Sambo buoy (nun, red) should be nearly in range with the lighthouse and nearly 1 mile distant. Continuing the **WSW. ½ W.** course it should lead 1½ miles southward of Sand Key Lighthouse. When Key West Lighthouse bears nearly **N. ¼ W.** the Main Ship Channel Entrance buoy will be in range with the lighthouse and about 1½ miles distant.

On the **W. ¼ S.** course Beacon "**2**" (on Western Dry Rocks) will be left nearly 1¼ miles on the starboard hand; Satan Shoal buoy (can, red and black horizontal stripes) and Vestal Shoal buoy (can, black) should be left a little over 1 mile on the starboard hand; Coalbin Rock buoy (can, red and black horizontal stripes) should be left about 1¼ miles to the starboard hand, when 11¾ miles westward of Sand Key Lighthouse; Marquesas Rock buoy (nun, red and black horizontal stripes) should be left 1¾ miles on the starboard hand, when about 6½ miles westward of Coalbin Rock buoy. On the **NW. ¾ N.** course Rebecca Shoal Lighthouse should be made well on the starboard bow.

(See also the note just preceding section 6.)

Dangers.—**Western Dry Rocks** is a reef lying about 2¾ miles **W.** by **S.** from Sand Key Lighthouse and marked by Beacon "**2**;" the beacon should not be approached from southward closer than ¼ mile.

Satan Shoal, a small 16-foot spot lying 4⅜ miles **W. ¾ S.** from Sand Key Lighthouse, is marked by a red and black horizontally striped can buoy.

Vestal Shoal is a small 16-foot spot lying 6¼ miles **W. ¾ S.** from Sand Key Lighthouse and is marked by a black can buoy.

Coalbin Rock, a small spot with 18 feet of water over it, lies 11½ miles **W. ⅝ S.** from Sand Key Lighthouse and is marked by a red and black horizontally striped can buoy.

Marquesas Rock is a small 12-foot spot lying 18 miles **W. ¼ S.** from Sand Key Lighthouse; the rock is marked by a red and black horizontally striped nun buoy.

Cosgrove Shoal is a small unmarked 16-foot spot lying 1¼ miles **E.** from Marquesas Rock.

A small unmarked 17-foot spot lies 2 miles **W.** of Marquesas Rock.

A small 4½-fathom spot lies 5¼ miles **W. ¾ S.** from Marquesas Rock buoy and about 1½ miles northward of the sailing line. This spot would be dangerous for deep draft vessels in a heavy sea.

STEAMSHIP ROUTES FOR VESSELS BOUND FROM CAPE HATTERAS TO THE GULF OF MEXICO.

There are two general routes followed by the steamers of regular lines from Cape Hatteras to the Gulf of Mexico. One of these routes skirts the coast and avoids the Gulf Stream by passing inside or westward of it. The other route crosses the Gulf Stream at Hatteras and leads for Matanilla Shoals; from thence across the Straits of Florida at Jupiter Lighthouse and then follows along the coast and the Florida Reefs. The latter route is about 45 miles shorter than the former, but as it necessitates crossing the Gulf Stream twice, practically it is but little shorter.

One of the chief considerations which influence the navigator when selecting the route he will take, is his ability to make Matanilla Shoal or the northwest corner of Little Bahama Bank in the daytime. The season of the year may also affect his selection of the route. Some state that in winter the average weather is better and the sea not so heavy westward of the Gulf Stream as eastward, this being the case either in easterly or westerly gales. It is generally conceded that during the summer, if Matanilla Shoal can be made in daylight, the outside route is the easier for the navigator.

SAILING DIRECTIONS FOR THE STEAMER ROUTE TO THE WESTWARD OF THE GULF STREAM.

When off Cape Hatteras keep 12 to 13 miles from the lighthouse and do not shoal the water to less than 12 or 13 fathoms. The lead should be used frequently while off the cape.

With Cape Hatteras Lighthouse bearing **NW.** and in soundings showing over 13 fathoms of water, or from Diamond Shoal Light-vessel, make good a **SW.** ¾ **W.** course for 69 miles; then make good a **SW.** by **W.** course for 88 miles. Frying Pan Shoals Light-vessel should then be 3 miles distant on the starboard beam.

From this position make good a **SW.** ½ **W.** course for 145 miles to latitude 32° 00′ N. and longitude 80° 00′ W., with a depth of 14 to 16 fathoms. Then make good a **SSW.** course for 65 miles to latitude 31° 00′ N. and longitude 80° 30′ W., with a depth of 16 to 18 fathoms. Then make good a **S.** ¼ **E.** course for 143 miles to Hetzel Shoal whistling buoy off Cape Canaveral.

From this buoy the directions in Section 4, page 40, should be followed.

Remarks.—A description of Hatteras Shoals will be found on page 38; Cape Lookout Shoals on page 39; Frying Pan Shoals on page 39; and the shoals off Cape Canaveral on page 40. When approaching Cape Lookout Shoals the lead should be used frequently and the vessel hauled offshore if the soundings show a depth of less than 9 fathoms. The light can only be seen on a clear night and may not be seen at all. When approaching Frying Pan Shoals frequent soundings should be taken and a depth of not less than 8 fathoms should be obtained if the vessel has not been set off her course.

Having stood on the **S.** ¼ **E.** course for 135 miles, soundings should be taken frequently and the water should not be shoaled to less than 12 fathoms before Hetzel Shoal whistling buoy is sighted. The buoy bears **NNE.** ⅛ **E.** distant nearly 13½ miles from Cape Canaveral Lighthouse. If the course has been made good, on a clear night Cape Canaveral Light should be sighted from a height of 15 feet above the water at a distance of 4 miles before the buoy bears abeam; the light when sighted should bear westward of **SW.** by **S.**

SAILING DIRECTIONS FOR THE STEAMER ROUTE CROSSING THE GULF STREAM TO MATANILLA SHOAL, THENCE TO JUPITER LIGHTHOUSE.

The distance from Cape Hatteras to Jupiter Lighthouse by this route is 560 miles. After passing Cape Hatteras a vessel in laying her course for a point in latitude 32° 15′ N. and longitude 76° 00′ W., can allow for being in the Gulf Stream current for a distance of about 80 miles, as she crosses it diagonally and takes the current forward of the starboard beam. A fair average allowance to make for the current for this distance is about 1½ miles per hour northeastward; this allowance has been made for the courses given for crossing the Gulf Stream in the following paragraph. (See also pages 34–37 for general remarks on the Gulf Stream.)

Taking a departure from Cape Hatteras with the lighthouse bearing **NW.** distant 13 miles and in 13 fathoms of water, a vessel with a speed of 10 knots should steer **S.** by **W.** ⅝ **W.** for 184 miles. Or, a vessel with a speed of 12 knots should steer **S.** by **W.** ⅝ **W. Southerly** for 182 miles. This should make good a **S.** by **W.** ¼ **W.** course and lead to a position in latitude 32° 15′ N. and longitude 76° 00′ W.

From this position a **SSW. ¾ W.** course made good for 332 miles will lead to the northwest corner of Little Bahama Bank off Matanilla Shoal.

From the northwest corner of Little Bahama Bank to Jupiter Lighthouse a fair average allowance of 2¼ miles per hour can be made for the Gulf Stream current for a distance of 54 miles, the set being northward. This allowance has been made for the following courses:

A vessel with a speed of 10 knots when clear of Little Bahama Bank should steer **SW. ½ W.** for 61 miles. Or, a vessel with a speed of 12 knots should steer **SW. ¾ W.** for 60 miles. The vessel should then be in 10 fathoms of water with Jupiter Lighthouse about 1½ miles distant ahead. When approaching Jupiter Lighthouse care should be taken to avoid the wreck which lies 3¼ miles **ESE.** from the lighthouse. From Jupiter Lighthouse the directions in section 4, page 40, should be followed.

Remarks.—No allowance for the currents can be given between latitude 32° 30′ N., longitude 75° 50′ W. and the northwestern end of Little Bahama Bank. The greatest caution is necessary when approaching Little Bahama Bank, as the usual indications of shoal water are lacking. The water is very clear on the bank and the bottom can usually be seen from aloft in a safe depth. The lead should be used frequently and if it is found that the vessel has been set eastward a **W.** course will skirt the northern edge of the bank westward of Matanilla Reef. After a strong breeze white water will sometimes be seen on Matanilla Shoal and there may be a slight change from a dark to a lighter blue in the water on the bank. In the night the bank should be given a wide berth.

It is high water, full and change, nearly everywhere in the Bahama group, at 7 hours 40 minutes; springs rise 4 feet and neaps 3 feet. The tidal stream sets directly on and off all the banks at the rate of from 1 to 2 miles, except in the narrow channels between the keys, where its velocity is greatly increased.

COAST FROM CAPE HENRY TO CAPE FEAR.*

Cape Henry, on the southern side of the entrance to Chesapeake Bay, presents, when seen from seaward, a bold range of sand hills, which, by reason of their unusual height (80 feet) and bold surfaces, show very conspicuously from a long distance. Opposite the pitch of the cape the crest of this range is ½ mile from high-water mark, the intervening space being filled by a cluster of lower hills, gradually diminishing in height to the smooth, flat beach that borders the coast. On this beach is **Cape Henry Lighthouse** (see table, page 12), and about 340 feet **SW.** by **W.** from it is the old lighthouse tower. Near the lighthouse is **a storm warning display and telegraph station of the United States Weather Bureau**, from which storm signals are displayed, and with which vessels may communicate by the use of International Code Signals.

From Cape Henry to Cape Hatteras the general trend of the coast is about **S.**, and it is broken by two unimportant inlets. **Oregon Inlet**, the break in the beach about 1¼ miles southward of Bodie Island Lighthouse, is used by fishermen, and sometimes by small coasters as a harbor. The depth in the channel is about 8 feet, but it is not marked by buoys or other aids. About 4 feet can be taken from the inlet over The Swash into Pamlico Sound. **New Inlet**, the break in the beach about 9 miles southward of Bodie Island Lighthouse, can only be used by small boats, with smooth water.

From Cape Henry southward for a distance of 11 miles there are heavy woods close along the beach, but for the remainder of the distance, nearly 100 miles, the coast consists of a low, flat, and narrow strip of land, varying in width from ⅛ to 2¾ miles, separating the extensive interior waters (see description) of North Carolina from the Atlantic Ocean. There are no prominent or easily recognized natural landmarks along this stretch of coast.

About 21½ miles **S.** of Cape Henry there are two sand hills, one 60 and the other 40 feet in height, called respectively **Wash Hill and Sheep House Hill.** When seen from a distance, bearing northward of **W.**, the locality in the vicinity of these hills resembles Cape Henry, and has been mistaken for that headland, and, in consequence, received the name of **False Cape.**

Cape Hatteras, in about latitude 35° 15′ **N.**, is the name given to the sandy point formed by the sharp bend of the coast westward. It is marked by **Cape Hatteras Lighthouse** and **beacon** (see table, page 12), the former of which will be seen long before the land can be made out. Near the lighthouse are several houses, and near the beacon is **Cape Hatteras Life-Saving Station.** Westward of the lighthouse there are dense woods. As the appearance of the cape is so different when seen from different directions, and as vessels should not pass close enough to recognize any particular natural features, no detailed description of it would be of use, and hence none is given.

*Shown in parts on charts 10, 11, scale $\frac{1}{400,000}$, price of each $0.50; and 137, 138, 139, 145, 146, 147, 148, 149, scale $\frac{1}{80,000}$, price of each $0.50.

Diamond Shoal Light-vessel is moored in 30 fathoms of water and about 15 miles southeastward of Cape Hatteras Lighthouse; it is a valuable aid to keep vessels clear of Hatteras Shoals (see table, page 12).

The coast between Cape Henry and Cape Hatteras is entirely free from dangers if it be given a berth of 5 miles or more, and along the greater part of it 5 to 9 fathoms can be taken to within 1 mile of the beach. The shoals lying off this stretch of coast are: False Cape Shoals, with depths of 14 to 18 feet over them, extending ¾ to 1¾ miles offshore near False Cape; Platt Shoals, with 4½ to 6 fathoms, lying about 3¾ miles offshore, a little southward of Bodie Island Lighthouse; Wimble Shoals, with depths of 3½ to 6 fathoms, lying about 4 miles offshore, nearly abreast what are known as **Chicamicomico Woods**, about 20 miles northward of Cape Hatteras; and Hatteras Shoals, which are dreaded by all mariners navigating in the vicinity of Cape Hatteras.

The latter shoals extend in a southeasterly direction for a distance of nearly 8 miles from the pitch of the cape, and consist of three principal shoal patches—The Spit, Diamond Shoal, and Outer Shoal. All of the shoals mentioned above are more fully described on page 38.

Soundings along the coast between Cape Henry and Cape Hatteras.—East of Cape Henry the 20-fathom curve is about 45 miles offshore, and the 30-fathom curve about 56 miles (both curves extending southward in a general **S.** by **W.** direction), but the deep water draws rapidly in toward the coast southward; southeastward of Cape Hatteras the 20-fathom curve will be found from 12 to 15 miles and the 30-fathom curve about 1½ miles farther from the pitch of the cape, both approaching within 5 miles of the southeastern extremity of Hatteras Shoals.

The depths inside of the 20-fathom curve are extremely irregular, there being many holes of limited extent lying far inside the general limits of corresponding depths. Eastward of Cape Henry a depth of 15 fathoms is found about 28 miles offshore, while abreast of Chicamicomico Woods the same depth is found only 5 miles offshore. In navigating along this coast in thick weather the closest attention should be paid to the soundings and chart, and even then the navigator is likely to be confused and led into danger in consequence of the irregularities of depth.

Currents.—The strong currents which set up and down this stretch of the coast with southerly and northerly gales, are a special source of danger to mariners attempting to hug the coast to keep clear of the Gulf Stream during southeasters. (See the remarks on currents on pages 33, 34.)

Cape Hatteras to Cape Lookout.—At Cape Hatteras the shore makes a sharp curve to **WSW. ½ W.** and then curves gradually southward to Cape Lookout, its general direction being about **SW.** by **W.** and its length about 63 miles. The small portion of the Atlantic Ocean bordering on this coast is known as **Raleigh Bay**. For 6 miles westward from Cape Hatteras the coast is heavily wooded; between the woods and the sand beach there is a range of sand hills from 10 to 40 feet in height. The remainder of the coast to Cape Lookout is formed by narrow strips of sand beach, with many sand hills, separating Pamlico and Core sounds from Raleigh Bay. There are only two breaks in this stretch of coast, Hatteras and Ocracoke inlets (see descriptions) about 11 and 25 miles respectively **WSW. ½ W.** from Cape Hatteras. Several life-saving stations (see page 11) will be seen by vessels running close along the shore.

Cape Lookout is the extremity of a long and very narrow strip of sand beach projecting into the sea from the sharp angle of the coast forming the point of division between Raleigh and Onslow bays. The land in the vicinity of the cape is all low and presents no natural features more conspicuous than groups of sand hills 10 to 40 feet in height; the locality is, however, unmistakably marked by the tall shaft of **Cape Lookout Lighthouse** (see page 12).

Lookout Shoals.—Taking a depth of 18 feet as the limit to these shoals, their extremity lies about 10 miles **S.** by **E.** from Cape Lookout Lighthouse, but spots with 4¾ to 6 fathoms lie nearly 14 miles **SSE.** from the lighthouse. (These shoals are more fully described on page 39.)

Soundings from Cape Hatteras to Cape Lookout.—The coast is quite bold-to and 4 to 7 fathoms may be taken to within ½ mile of the shore except off Hatteras Inlet, where shoals extend out 1½ miles, and off Ocracoke Inlet, where they make out nearly 2 miles.

The 20-fathom curve extends in a general **SW. ½ W.** direction, and the 30-fathom curve about **SW. ½ S.** from off Cape Hatteras until eastward of Cape Lookout, the first-mentioned curve being about 17 miles offshore, the latter from 5 to 10 miles farther out. Eastward of Cape Lookout both curves bend southward; and in a **SE.** direction from Cape Lookout Lighthouse the distance to the 20-fathom curve is 32 miles and to the 30-fathom 34 miles.

Cape Lookout to Cape Fear.—The coast extends about 8 miles in a northwesterly direction from Cape Lookout and then curves gradually westward and southward to Cape Fear; the latter cape bearing from the former **SW.** by **W. ½ W.** distant about 85 miles. This coast, nearly 100 miles in length, is very similar to that between Cape Hatteras and Cape Lookout (see description above), but the strips of land forming it are separated from the mainland by much narrower bodies of water, and consequently the thick woods of the mainland can

be seen from much farther to seaward. That part of the Atlantic Ocean bordering on this curved coast is known as **Onslow Bay**, and it is connected with the interior waters by numerous shallow and generally unimportant inlets. These inlets named in order from the northward, with their distances from Cape Lookout Lighthouse, are: Beaufort Entrance, 8 miles; Bogue Inlet, 29; Bear Inlet, 33; Browns Inlet, 35½; New River Inlet, 41; New Topsail Inlet, 58; Topsail Inlet, 61; Sidbury Inlet, 62; Rich Inlet, 63½; Queens Inlet, 66; Wrightsville (Barren) Inlet, 68; Masonboro Inlet, 70; New Inlet, 82; Goldleaf Inlet, 84; Corncake Inlet, 85. The most important of these, Beaufort Entrance and Bogue Inlet, are treated under separate headings.

Cape Fear is the low, sharp point of sand beach forming the southern extremity of **Smith Island**. This island, lying on the eastern side of the entrance to Cape Fear River, is of irregular shape, is mostly low and marshy, but has a thick growth of trees on its western side. Near the northwestern extremity of the island is **Cape Fear Lighthouse** (see table, page 16), which will usually be the first object seen in approaching the cape. Cape Fear Life-Saving Station is about ½ mile northward from the extreme end of the cape, and when seen from the eastward will be backed by heavy woods.

Frying Pan Shoals are especially dangerous on account of the great distance to which they make out from the shore. They lie between the bearings **S. ½ E.** and **SSE. ¾ E.** from Cape Fear. The outer shoal, with 16 feet over it, is 14½ miles from the pitch of the cape, and 2¾ miles southward of it is Frying Pan Shoals Light-vessel. For a more detailed description of these shoals see page 39.

Soundings Cape Lookout to Cape Fear.—The depth along this stretch of coast is very regular; 4 to 6 fathoms can be taken to within 1 mile of the beach; the 10-fathom curve extends nearly parallel to, and at an average distance of about 8 miles from the shore until eastward of Cape Fear, where it bends southward and eastward around Frying Pan Shoals. The 20-fathom curve is from 20 to 45 miles offshore.

The geographical positions and descriptions of the lighthouses along the coast are given on pages 12–29, and a list of life-saving stations on page 11.

HATTERAS INLET *

is about 11½ miles westward of Hatteras Lighthouse and one of the two principal entrances from seaward into Pamlico Sound; it is sometimes used as a harbor of refuge by local coasting vessels, there being a fair anchorage inside the bar with a depth of about 3 fathoms. The entrance is obstructed by a shifting bar, over which the channel depth varies in different years from 9 to 15 feet. In March, 1900, the depth was 9 feet. The buoys marking the channel are shifted, when practicable, to indicate the best water.

It is said that the channel from the inlet over The Swash, into Pamlico Sound, has shoaled to a depth of about 3 feet. Strangers should not enter Hatteras Inlet without a pilot; a pilot should also be employed to pass through The Swash, as the channel is constantly shifting. Pilots are always on the lookout and will come out to a vessel when the sea on the bar will permit them to cross.

On the west side of the inlet the shore is a bare sand beach; Ocracoke Life-Saving Station is 1½ miles from the inlet and the most prominent object to the westward. About 2¼ miles eastward of the entrance is a clump of woods and the **Seacoast Telegraph Station of the United States Weather Bureau**, from which storm-warning displays are made; on the beach in front of the woods is Durant's Life-Saving Station. A white church spire in the village of Hatteras is quite prominent.

Tides.—In the inlet high water occurs 1 hour 42 minutes before, and low water 1 hour 28 minutes before high and low waters at Old Point Comfort; the mean rise and fall is 2 feet. In The Swash the rise and fall depends almost entirely on the direction and force of the wind.

Currents.—The tidal currents in the inlet and the channels through The Swash are much influenced by the winds and obtain a velocity at times of from 2 to 2½ miles per hour. The flood current commences nearly 3½ hours after low water and the ebb current about 3 hours after high water.

SAILING DIRECTIONS TO HATTERAS INLET.

Only directions as far as the Outer buoy can be given, as the channel over the bar changes frequently, and even the buoys can not always be depended on to indicate the best water.

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*Shown on charts 142, 145, scale $\frac{1}{80,000}$, price of each $0.50.

1. *From the Eastward.*—Having passed outside of the Outer Shoals off Cape Hatteras, at a distance of at least 10 miles from the lighthouse: or, from Diamond Shoal Light-vessel steer **W.** taking care not to shoal the water to less than 7 fathoms. When Hatteras Lighthouse bears **NNW.** and is distant about 10 miles, steer **WNW. ½ W.** This course made good for about 15 miles will lead off the entrance to the inlet, with Hatteras Inlet Lighthouse showing through the opening, and the Outer buoy bearing off the starboard bow, distant about 1 mile. Keep at least ½ mile southward of this buoy until boarded by a pilot.

Remarks—**Diamond Shoal Light-vessel** may be several miles out of position on account of the vessel dragging her moorings. Vessels standing westward from the light-vessel should exercise caution until clear of Hatteras Shoals.

The **WNW. ½ W.** course leads about 1½ miles southward of Outer Shoals. When Hatteras beacon and the lighthouse are in range the vessel will be clear and westward of Outer and Diamond shoals. Care must be taken not to be set on the shoals by the current (see the notes on currents, page 34). Westward of Cape Hatteras the shore can be approached as close as 1 mile in 7 fathoms of water, and there are no shoals making offshore except at the entrance to the inlet.

1 A. *From the Westward.*—Having passed outside of Cape Lookout Shoals and at least 11 miles southward of Cape Lookout Lighthouse, when the lighthouse bears **NNW.** distant about 11 miles, steer **NE. ⅝ N.** This course made good for nearly 55 miles will lead up to the entrance of Hatteras Inlet and the Outer buoy should be about 1 mile distant on the port bow. Keep at least ½ mile southward of the buoy until boarded by a pilot.

Remarks.—While on the **NE. ⅝ N.** course Ocracoke Lighthouse will be left 7½ miles on the port beam. Eastward of Cape Lookout Lighthouse there are no shoals except those making off from Ocracoke Inlet entrance to a distance of 1½ miles. By giving the shore a berth of over 1½ miles a depth of 7 fathoms and over can be taken along the coast to Hatteras Inlet.

OCRACOKE INLET*

is about 26 miles **WSW.** from Hatteras Lighthouse and about 15 miles westward of Hatteras Inlet; it is (1900) the principal entrance to Pamlico Sound from seaward, and is used as a harbor by small coasting vessels, the anchorage inside being protected by the extensive shoals which extend across the entrance and 5 miles northward of the inlet. The entrance is obstructed by a shifting sand bar, which extends 1½ miles seaward, and in March, 1900, had a depth of about 10 feet in a buoyed channel, but this depth is said to be changing. Inside the entrance there are several channels or slues which lead into the shoal lying to the northward; **Teaches Hole Channel** leads northeastward along the western side of Ocracoke Island and then northwestward over what is known as **The Swash** into Pamlico Sound; about 6 feet is the best depth that can be carried through this channel, which is buoyed. A slue known as **Wallace Channel** leads northwestward from the inlet and through a dredged channel over the bulkhead into Pamlico Sound; this channel (in March, 1900) had a depth of about 6 feet.

Ocracoke Lighthouse (see table, page 12) is near a clump of woods on the eastern side of the entrance, and is the easiest recognized mark in the vicinity. On the western side of the entrance is the village of **Portsmouth**; as the entrance is approached the houses will show among clumps of trees.

Strangers should not enter the inlet without a pilot, as the buoys can not always be depended on to lead in the best water, and the shifting character of the shoals prevents giving permanent directions. Pilots are always on the lookout for vessels desiring to enter, and will cross the bar when the sea will permit.

Tides.—The mean rise and fall of tides in the entrance of the inlet is 2 feet, and inside the inlet about ½ foot; high and low waters occur about the same time as at Hatteras Inlet.

Currents.—The ebb current usually has a greater velocity than the flood. Both the range of the tide and the velocity of the current are affected by strong winds (see the note on currents in Hatteras Inlet).

SAILING DIRECTIONS TO OCRACOKE INLET.

Only directions as far as the Sea buoy can be given, as the channel over the bar changes frequently. A stranger should not attempt to enter without a pilot.

*Shown on charts 143, 145, 146, scale $\frac{1}{80,000}$, price of each $0.50.

1. *From the Eastward.*—Having passed outside of the Outer Shoals off Cape Hatteras, at a distance of at least 10 miles from the lighthouse, when Hatteras Lighthouse bears **NNW.** and is distant about 10 miles, steer **W. ¼ S.** This course made good for about 26 miles will lead to the entrance, the Sea buoy bearing on the starboard bow, distant about ½ mile. Keep at least this distance southward from the Sea buoy until boarded by a pilot.

Remarks.—On the **W. ¼ S.** course Ocracoke Lighthouse will be made broad off the starboard bow. There are no outlying shoals after passing the Hatteras Shoals, and a depth of 7 fathoms or more can be carried to within 1½ miles of the shore.

2. *From the Westward.*—Having passed outside of Cape Lookout Shoals, and at least 11 miles southward of Cape Lookout Lighthouse, when the lighthouse bears **NNW.** distant about 11 miles, steer **NE. ⅞ N.** This course made good for 43 miles should lead to a position off the entrance about ¾ mile southward of the Sea buoy, and Ocracoke Lighthouse should bear **N.** distant about 4 miles. Keep at least 2 miles outside the entrance until boarded by a pilot.

Remarks.—On the **NE. ⅞ N.** course Ocracoke Lighthouse should be made broad off the port bow. The shore can be approached as close as 1 mile with a depth of 5 fathoms while westward of the inlet, but off the inlet shoals make out for a distance of 1½ miles.

LOOKOUT BIGHT*

is on the west side of the point which extends southward from Cape Lookout Lighthouse. The bight affords good anchorage in easterly winds for large vessels, and a limited number of small vessels of 9 feet or less draft can find shelter from all winds, but the width of the anchorage inside the hook is about 200 yards. The greatest difficulty in making this anchorage, when a vessel is eastward of Cape Lookout, lies in the distance which she must run southward of the cape to clear Cape Lookout Shoals. In easterly gales these shoals are marked by breakers, and when westward of them the sea will be somewhat broken. The anchorage for large vessels is in 5 to 6 fathoms water about ⅛ mile westward of Cape Lookout Lighthouse, and for small vessels inside **Wreck Point**, the point which makes northward on the western side of the bight. Steamers when short of coal can obtain a limited supply from Beaufort in a lighter by communicating with the latter place from Cape Lookout by telephone. It is proposed to construct a breakwater for a harbor of refuge near Lookout Bight.

Storm Warning Displays of the United States Weather Bureau are made at Cape Lookout.

SAILING DIRECTIONS, LOOKOUT BIGHT.

1. *From the Southwestward.*—While westward of Cape Lookout Shoals do not approach them closer than in 8 fathoms of water until up to the pitch of the cape. Do not approach the cape closer than 1 mile until the lighthouse bears eastward of **NE.** When Cape Lookout Lighthouse bears between **ENE.** and **E.** by **S.** steer for the lighthouse, and if of more than 9 feet draft anchor in 5 fathoms of water, sticky bottom, from ¾ to 1 mile westward of the lighthouse. If of less than 9 feet draft, round the point of the hook, giving it a berth of 200 yards, and stand southward into the cove, giving the eastern shore of the hook a berth of about 175 yards; anchor just southward of a line from the lighthouse to the north point of the hook.

Remarks.—The anchorage in the cove inside the hook is narrow, and vessels, to have swinging room, must anchor in much more water than their draft would necessitate. To get the best shelter it is necessary to anchor as close as possible to the hook. The bottom will feel hard to the lead but it affords fair holding ground improving as the cove is entered.

1 A. *From the Westward.*—Bring Cape Lookout Lighthouse to bear between **ENE.** and **E.** by **S.** and steer for it between these bearings; when about 1½ miles from the lighthouse follow the directions in section 1 to an anchorage. (See also the remarks preceding.)

*Shown on charts 146, 147, scale $\frac{1}{80,000}$, price of each $0.50.

BEAUFORT HARBOR, N. C.,*

is part of the chain of interior waters stretching along the coast between Cape Henry and Cape Fear (described in another part of this volume), and is the most important harbor on this coast between Cape Henry and Cape Fear. **Newport River,** which is important only as an approach to the Clubfoot Canal, is a broad shallow stream emptying into the head of the harbor.

The entrance to Beaufort Harbor is about 7½ miles **WNW.** from Cape Lookout Lighthouse; it is obstructed by a shifting bar which extends nearly 1½ miles seaward and in April, 1900, had 11 feet of water in the channel across it. Buoys are placed to mark the channel over the bar and are moved whenever the channel shifts, but they can not always be depended upon to indicate the best water. Inside the bar there is a depth of 3 to 5½ fathoms in the channel, and good anchorage for vessels seeking shelter from storms. Strangers are advised to take a pilot, as owing to the shifting nature of the bar directions can not be given. Pilots will come out to a vessel if the sea will permit them to cross the bar.

The town of **Beaufort,** on the eastern side of the harbor, is reached through a narrow slue leading between shoals and by a dredged channel 100 feet wide and about 4 feet deep. A draft of about 6 feet can be taken alongside the wharves of the city at high water. A supply of about 150 tons of coal is kept on hand at a coal yard and can be had in lighters. Vessels of a draft of 5 feet can pass from Beaufort through Core Sound and thence through the inland waters and canals to Chesapeake Bay. Thus it is possible for masted vessels of 5 feet draft to pass through inland waters and canals from the eastern end of Long Island Sound to Beaufort, N. C.

Morehead City is on the western side of the harbor; it is the terminus of a railroad and a shipping point for some lumber. The railroad company's wharf extends out into the deep water of the channel on the west side of the harbor and forms a conspicuous mark when entering. Several low marsh islands and extensive shoals lie in the middle of the harbor between Morehead City and Beaufort; and southward of Morehead City extending westward is Bogue Sound, through which a draft of 3 feet can be taken to Bogue Inlet.

The Anchorage is on the western side of the harbor, from the western point at the entrance (Fort Macon) to a short distance above the railroad wharves at Morehead City. Provisions and ship chandler's stores can be had at Beaufort and Morehead City.

Hospital.—The nearest marine hospital is at Wilmington, N. C. At Beaufort there is a relief station (Class III) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Storm-Warning Displays of the United States Weather Bureau are made at Beaufort and Morehead City.

Tides.—The mean rise and fall of tides is 2.8 feet. High water occurs 12 minutes before and low water 15 minutes before high and low waters at Charleston, S. C.

Currents.—The tidal currents in the entrance run with considerable velocity, especially during spring tides. They generally follow the direction of the channel, but on the last quarter of the flood and first of the ebb they are apt to set across the shoals.

SAILING DIRECTIONS TO BEAUFORT HARBOR.

Owing to the frequent changes of the bar, directions can only be given as far as the Sea buoy at the entrance. A stranger should not attempt to enter without a pilot, but if compelled to do so he must be guided by the buoys and breakers.

1. ***From the Eastward.***—Standing along the coast as directed in section 2, on page 38, and having passed outside of Cape Lookout Shoals and at least 11 miles southward of the lighthouse, when the lighthouse bears **N.** and is distant about 11 miles, steer **NNW. ½ W.** This course made good for 15 miles should lead up to the Sea buoy.

Remarks.—The **NNW. ½ W.** course should lead about 2 miles westward of Cape Lookout Shoals. The shoals should not be approached closer than in 8 fathoms of water. As Beaufort entrance is approached **Fort Macon** on the western point at the entrance will be a little on the starboard bow and the town of Beaufort will show clear of the eastern point at the entrance. A good lookout for the Sea buoy should be kept as soon as Cape Lookout Lighthouse bears to the southward of **E.** by **S.**

1 A. ***From the Westward.***—Passing ½ mile southward of Frying Pan Shoals Light-vessel, steer **NE. ¼ N.** This course made good for a distance of 86 miles will lead up to the Sea buoy off Beaufort entrance.

*Shown on charts **147**, scale $\frac{1}{80,000}$, price $0.50; and **420**, scale $\frac{1}{40,000}$, price $0.25.

Or, if eastward of Cape Fear and desiring to follow the shore, give it a berth of about 1½ miles; this will lead in 5 to 7 fathoms water until nearly up to Beaufort entrance, where the vessel must be kept outside of the shoals which make off 1½ miles from the entrance.

Remarks.—On the **NE. ¼ N.** course Cape Lookout Lighthouse should be made forward of the starboard beam before the Sea buoy is sighted. (See also the remarks under section 1 preceding.)

BOGUE INLET *

is 21 miles westward of Beaufort entrance, and is an outlet to the interior waters skirting the coast as well as to White Oak River. The opening of the inlet is about ¾ mile wide, with bare sand spits on either side. The entrance is obstructed by a short, shifting sand bar, which extends a little over ½ mile seaward, and on which the channel depth is about 6 feet. This channel is marked by several buoys, but they are small and can not well be seen until close-to, and can not always be depended upon to indicate the best water. Inside the bar a deep channel leads to the village of **Swansboro,** on the west bank, at the mouth of White Oak River. Strangers desiring to enter the inlet should wait outside for a local pilot. The mean rise and fall of tides is about 2½ feet.

Sailing Directions that could be relied on for entering can not be given. The approach to the entrance is safe; between Beaufort entrance and the Sea buoy the shore can be approached as close as 1 mile. Southwestward of the Sea buoy the shore should be given a berth of 1½ miles, to avoid the shoals off New River Inlet.

The following courses will lead to the Sea buoy off the entrance to Bogue Inlet. With Cape Lookout Lighthouse bearing **N.** distant 11 miles, steer **WNW. Northerly** 31½ miles. From Frying Pan Shoals Light-vessel steer **NNE. ¾ E.** for 72 miles.

NEW RIVER INLET †

is 35 miles westward of Beaufort entrance and 53 miles eastward of Cape Fear; it is the outlet of a shallow stream called **New River,** and communicates with the shallow creeks which drain the marshes eastward and westward. The inlet is of little importance, the depth on the bar changing from 2½ to 7 feet; the navigable depth of the river is 2 and 3 feet. There are no aids to assist a stranger in entering and a pilot should be employed. Persons acquainted with the inlets between Cape Lookout and Cape Fear can be found at Southport or Beaufort. The rise and fall of tides is about 2 feet on the bar and about ½ foot inside the inlet.

Sailing Directions for entering could not be relied upon. The approach to the entrance is safe if the shore eastward of the entrance be given a berth of 1½ miles and westward of the entrance a berth of 1 mile.

CANALS CONNECTING THE WATERS OF CHESAPEAKE BAY WITH THE INLAND WATERS OF NORTH CAROLINA.

The **Southern Branch of the Elizabeth River** forms the northern approach to the two canals which afford passages from Chesapeake Bay to the inland waters of North Carolina. This branch is of considerable commercial importance; there are several large lumber mills at which vessels load, and all the commerce using the canals also passes through the branch. Between the Navy Yard at Portsmouth and Deep Creek the branch is crossed by three railroad drawbridges, the widths of draws being from 43 to 100 feet. For a distance of 7 miles from Norfolk the Southern Branch is navigable for vessels of 12 feet draft at high water, and vessels load to that draft with lumber; above this and to the lock of the Albemarle and Chesapeake Canal the depth in the channel is about 9 feet. The channel for its whole length of 12 miles is well marked by buoys, but is narrow and crooked in places, and vessels of 200 feet length may have some trouble in keeping in the best water.

Deep Creek, which empties into the Southern Branch about 7 miles above Norfolk, is the approach to the Dismal Swamp Canal: the creek has been improved by dredging a channel 40 feet wide and 9 feet deep from the Southern Branch to the canal. This dredged channel is crooked, and in March, 1900, had narrowed in some places to 30 feet and shoaled to less than 8 feet at low water; but this channel is to be widened and deepened to permit any vessel passing through that can use the canal.

The distance from Norfolk to Albemarle Sound by either canal is about 60 miles, and the deepest draft that can (in 1900) pass through the canals, their approaches, and the inland waters of North Carolina is 8 feet.

The Albermarle and Chesapeake Canal connects the Southern Branch of the Elizabeth River with North Landing River, and has one lock at its northern end, about 12 miles from the city of Norfolk. This canal is about 7½ miles long and affords a passage for vessels 200 feet long, 39 feet beam, and 8 feet draft; it is

* Shown on chart 148, scale $\frac{1}{80,000}$, price $0.50.

† Shown on charts 148, scale $\frac{1}{80,000}$, price $0.50; 422, scale $\frac{1}{10,000}$, price $0.25.

crossed by several drawbridges. The principal difficulty encountered by vessels passing through is when meeting or trying to pass a raft in tow, but by giving notice to the manager at Norfolk it will be kept clear when necessary. The depth of water in the canal is lowered by northerly winds and raised by southerly winds, the extreme difference of level is said to be as much as 3 feet in the mouth of North Landing River.

The Dismal Swamp Canal connects Deep Creek with the Pasquotank River; the northern lock of the canal is about 8½ miles above the city of Norfolk. This canal is about 19 miles long, 60 feet wide, and 9 feet deep, with turn-outs at distances of about 3 miles where vessels may pass each other; the two locks are 250 feet long, 40 feet wide, and 10 feet deep. Two drawbridges cross the canal; the only settlement of any size on its banks is the village of **South Mills** about ⅛ mile inside the southern lock. This canal is easy to navigate, but in March, 1900, the channels in Deep Creek and Turners Cut, the two approaches to the canal, had shoaled, and in Deep Creek the channel was so narrow and the turns so sharp that its navigation was very difficult for vessels of even moderate length (120 feet or so), but dredging is to be done to widen and deepen both approaches.

GENERAL REMARKS AND DIRECTIONS, INLAND WATERS AND WATER WAYS FROM CAPE HENRY TO CAPE FEAR.

The descriptions following these remarks will furnish a general idea of the extent and connections of the large interior waters of North Carolina; their windings and irregular shapes would render any but very general descriptions and sailing directions voluminous and perhaps useless. The masters of vessels plying in these waters are either familiar with the routes or employ pilots, and all strangers should employ pilots.

The following remarks and directions are intentionally very general in their nature and are only intended to furnish an idea of the routes and to be of service to masters of vessels who may by some unforeseen circumstances be unable to obtain a pilot, and consequently be forced to rely on the charts and the assistance here given. The descriptions under the heading "Inland Waters and Water Ways from Cape Henry to Cape Fear" should be consulted so as to obtain a general idea of the depths, extent, etc., of these water ways.

1. ***From Chesapeake Bay to Albemarle Sound.—By way of the Albemarle and Chesapeake Canal.***—The distance from Norfolk to North River Lighthouse is about 58 miles, and the draft that can be taken through is 8 feet. Having entered Norfolk Harbor from Chesapeake Bay, continue in a general southerly direction up the Southern Branch of the Elizabeth River for about 12 miles, being guided by the buoys, to the entrance of the Albemarle and Chesapeake Canal. Here take a pilot and, if a sailing vessel, a towboat. The canal extends almost straight in about an **E.** ½ **S.** direction for 7½ miles, then connects with the North Landing River, which forms a crooked continuation of the route in a general **S.** by **E.** direction for about 10 miles to Beacon Light No. 1, near the entrance to Blackwater Creek. Here the North Landing River begins to widen rapidly, but it is shallow and the channel about 8 feet in depth, is narrow and was obtained by dredging. From Beacon Light No. 1 to North River, a distance of about 18½ miles, the channel is well marked by beacon lights and little difficulty should be experienced in keeping in it.

The beacon lights consist generally of a lantern on an iron column.

Leaving Beacon No. 1 on the starboard hand, steer **ESE.** ½ **E.** for ½ mile. Leave Beacon No. 2 on the port hand and steer **SSE.** for 2¼ miles. Leave Beacon No. 3 on the starboard hand and steer **S.** by **E.** ¼ **E.** for 5 miles, leaving Beacons Nos. 4 and 5 on the port hand. From Beacon No. 5 steer **SE.** for 2⅝ miles. Leave Beacon No. 6 on the port hand and steer **S.** by **E.** ¼ **E.** for about 2 miles. Leave Beacon No. 7 on the starboard hand and steer about **S.** ¾ **W.** for 1 mile to the entrance of the cut, leaving Beacon No. 8 on the starboard hand.

Entering the cut the course is **S.** ½ **E.** for 2¾ miles, to abreast the beacon (lantern on iron column) on the eastern side of the cut; here the course should be changed to **SSW.** ½ **W.** following the cut for 2⅝ miles to North River and to Beacon Light No. 9. From this beacon stand southward for about 4½ miles, keeping near the middle of the river until southward of Beacon Light No. 10. Here the North River broadens rapidly, is free from dangers, and a **SSE.** ⅝ **E.** course for nearly 6 miles should lead to the front range light at the entrance to

the dredged cut leading from the river into Albemarle Sound. This cut is straight, about 8½ feet deep, 1½ miles long, is buoyed and leads in a **S.** ⅞ **W.** direction. In passing out of the river the rear light of the range should be gradually opened eastward of the front light, North River Lighthouse will be left about 400 yards on the starboard hand and two red buoys on the port hand.

Having passed through this cut, if bound westward through Albemarle Sound or into any of its tributaries, be guided by the sailing directions for Albemarle Sound and tributaries.

1 A. ***From Chesapeake Bay to Albemarle Sound.—By way of the Dismal Swamp (Lake Drummond) Canal.***—The distance from Norfolk, Va., to Elizabeth City is about 45 miles and to Wade Point Lighthouse, at the mouth of the Pasquotank River, about 60 miles, and the greatest draft that could be taken through in March, 1900, was 8 feet. From Norfolk follow the channel of the South Branch of the Elizabeth River for a distance of about 7 miles to the entrance of Deep Creek. (The ruin of a brick chimney on the south bank at the entrance to the creek serves as a mark.) Stand up Deep Creek, which in March, 1900, had a channel depth of 8 feet, and least width of 30 feet, to the lock at the northern entrance to the canal. When through the canal (see description on page 51) the course is through Turners Cut for a distance of about 3½ miles and then down the Pasquotank, following the windings of the river on a general mid-river course for a distance of about 12 miles to Elizabeth City. From abreast of the city a mid-channel course down the river should be followed, leaving the buoys on the side indicated by their color, until Wade Point Lighthouse bears **SE.** by **E.** and red buoy No. 2 is made. Leave this buoy on the port hand and steer so as to pass 400 yards northward and at least 250 yards eastward of Wade Point Lighthouse.

2. ***From North River Entrance, or Pasquotank River Entrance.—Through Albemarle and Croatan sounds to Long Shoal Lighthouse, Pamlico Sound.***—A draft of about 8 feet can be taken through Croatan Sound when the water is at its ordinary level. Strong northerly winds will lower the water so that vessels of 7 feet draft can not pass through without getting aground.

When North River Lighthouse bears **N.** distant ¾ mile a **SSE.** course made good for 12¼ miles will lead to a point about 400 yards eastward of Caroon Point buoy (black, No. 5) with Croatan Lighthouse ¾ mile distant nearly ahead.

Or, when Wade Point Lighthouse bears **W.** distant 250 to 300 yards, steer **SE.** by **S.** for nearly 15 miles until Caroon Point buoy (black, No. 5) is 400 yards distant on the starboard beam. Croatan Lighthouse should be kept bearing on the starboard bow.

From a position 400 yards eastward of Caroon Point buoy steer **S.** ½ **E.** for ¾ mile, passing 250 yards westward of Croatan Lighthouse. Then steer **SE.** ⅛ **E.** for 4¼ miles, passing at least 150 yards southward of red buoy No. 4 and heading so as to pass 150 yards eastward of Blockade Shoal Beacon (black, lighted beacon). At night follow the southern edge of the red sector in Croatan Light and pass northward and eastward of the beacon showing a white light. From Blockade Shoal Beacon steer **S.** ⅜ **E.** a little over 5¼ miles, and pass 100 yards eastward of Roanoke Marshes Lighthouse. At night follow the eastern edge of the red sector in Roanoke Marshes Lighthouse.

Bring Roanoke Marshes Lighthouse to bear **N.** astern and steer **S.** for 1½ miles; then steer **S.** ¾ **E.** for 5¾ miles (Stumpy Point will then be on the starboard beam). Then steer **S.** ¼ **W.** for 9½ miles, when Long Shoal Lighthouse will bear **NW.** distant 2¼ miles. Or, steer **S.** by **W.** ⅛ **W.** about 8½ miles, passing ¼ mile eastward of Long Shoal Lighthouse.

If bound to places on Pamlico Sound, or its tributaries, follow the sailing directions under that heading.

3. ***From Long Shoal Lighthouse through Pamlico and Core sounds to Beaufort Harbor.***—Having Long Shoal Lighthouse bearing **NW.** distant 2¼ miles a **SW.** ⅝ **W.** course made good for 27¾ miles should lead to Bluff Shoal buoy (can, black and white

perpendicular stripes) and from this buoy steer **WSW.** ¼ **W.** about 4¾ miles, or until Northwest Point Royal Shoal Lighthouse is in range with Southwest Point Royal Shoal Lighthouse bearing about **S.** by **E.** ½ **E.**, the former being 1¼ miles distant; then make good a **S.** by **W.** ¾ **W.** course for about 10 miles, until up to the buoy (black and white perpendicular stripes) at the entrance to the channel across Harbor Island Bar, Core Sound.

Or, from a position ⅜ ***mile South of Long Shoal Lighthouse*** steer **SW.** ⅝ **W.** for 16½ miles; Gull Shoal Lighthouse should then be ¼ mile distant and on the starboard beam. Then steer **SW.** ⅛ **S.** for 15½ miles Northwest and Southwest Point Royal Shoal lighthouses should then be in range on the port hand, the Northwest Lighthouse being distant about ½ mile. From this position steer **SSW.** for 9¼ miles to the entrance buoy (black and white perpendicular stripes) about ⅜ mile northward of Harbor Island Bar Lighthouse.

From Harbor Island Bar through Core Sound and The Straits to Beaufort the distance is about 34 miles along the route marked by stakes. Strangers passing through should employ a pilot, as the route is somewhat crooked and the courses to be steered too numerous to be given; the general direction of the channel is about **SW.** to The Straits and then about **W.** through them to Beaufort. About 5 feet is the greatest draft that can ordinarily be taken through and then some difficulty may be experienced in crossing Harbor Island Bar and Piney Point Bar. The channel is marked by stakes, which "are shifted according to the channel and vessels should depend on them;" mid-channel stakes (black and white perpendicular stripes) with boards designate the best water and should be passed close-to; the red stakes mark the starboard (western) side of the channel and the black stakes the port (eastern) side. From Harbor Island Bar buoy steer **S.** ¾ **W.**, passing close to and westward of Harbor Island Bar Lighthouse, into the sound and then be guided by the channel stakes. (See description of Core Sound.)

From Beaufort to Cape Fear there are shallow waters which may be navigated by small boats, but the channels are not marked. (See heading Bogue Sound, Inlets, and Inland Water Ways from Beaufort to Cape Fear.)

INLAND WATERS AND WATER WAYS FROM CAPE HENRY, VA., TO CAPE FEAR, N. C.

CURRITUCK SOUND*

is a narrow and shoal body of water extending from its junction with Albemarle Sound in a general **NNW.** direction for 25 miles. It is separated from the Atlantic by a low narrow strip of sand of which a general description is given on page 45; **Currituck Beach Lighthouse** is situated on the eastern side of the sound about 7¼ miles from its northern end. The sound is for the most part so shoal as to be navigable only for boats and very small craft, its greatest depth being about 8 feet and the general depth, over the extensive shoals, about 2 to 4 feet. The part of the sound which is used by the vessels passing through the Albemarle and Chesapeake Canal to Albemarle Sound has a channel with a general depth of about 8 feet which is maintained by dredging.

Back Bay and its connection with Currituck Sound extends a little over 10 miles northward from the northeastern end of the sound. The bay is shoal and navigable only for boats. Northward of Back Bay is a shallow body of water known as **North Bay**.

NORTH LANDING RIVER†

empties into the northwestern part of Currituck Sound; the river is shallow, its greatest natural depth for a distance of 10 miles above its mouth being 7 feet. It is important only as a connection to the Albemarle and Chesapeake Canal, which has an outlet into the river about 19 miles above its mouth; for a distance of nearly 9 miles below the canal entrance the river is a narrow crooked stream, but below this it gradually widens to about 2¼ miles at its entrance. A channel 80 feet wide and 9 feet deep has been dredged in the wider part of the river; this channel in 1900 has a depth of about 8 feet and is used by the vessels passing through the river and canal; it is marked by lighted beacons. **Currituck** is a village on the west bank of the river about 2¼ miles to the westward of the beacon at the entrance. **Munden** is a post village about 7 miles above the mouth of the river; it has railroad communication with Norfolk.

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*Shown on charts **137**, **140**, $\frac{1}{80,000}$, price of each $0.50.

†Shown on charts **137**, scale $\frac{1}{80,000}$, price $0.50; **406**, scale $\frac{1}{40,000}$, price $0.20.

The **Albemarle and Chesapeake Canal** and connecting waters afford a passage from Chesapeake Bay to Albemarle Sound for vessels 200 feet long over all, 39 feet beam and 8 feet draft. From its entrance on the Elizabeth River, about 12 miles above Norfolk, to North River Lighthouse, the distance is about 48 miles. The route, from the northward, leads from the Elizabeth River through 7¼ miles of nearly straight canal, then down the North Landing River and into Currituck Sound, from thence into Coanjock Bay, and at its head through another cut about 3¼ miles long into North River and then down North River into Albemarle Sound. Strangers should employ a pilot to pass through the canal; sailing vessels must employ towboats. The bridges crossing the route will be opened by the keepers on hearing the whistle of approaching vessels. The ordinary speed of vessels when passing through the cuts is 3 knots. Vessels passing through the canal should be careful to avoid sunken logs.

COANJOCK BAY*

is an irregular shallow body of water making southward from the northwestern part of Currituck Sound and just southward of the mouth of North Landing River. The bay forms part of the Albemarle and Chesapeake Canal route and a channel about 9 feet deep has been dredged from its entrance to the head of the bay.

The inland waters are but little influenced by tides; the force and direction of the winds and the state of the rivers emptying into the sounds influence the rise and fall; long continued southerly winds raise the level while northerly and westerly winds lower it.

ALBEMARLE SOUND†

is 46¼ miles long in a general **E.** and **W.** direction, and has a width ranging from 11¼ miles near its eastern end to 3 miles about 9 miles from its western end. This sound has a good navigable depth for any vessel that can enter through any of the inlets or canals, and with its numerous tributaries forms the approach to a number of towns and landings, from and to which several steamers, barges, and a number of small sailing vessels (30 to 60 tons) are engaged in the carrying trade.

The eastern end of the sound, which is separated from the Atlantic by the narrow beach about 15 miles northward of **Bodie Island Lighthouse,** is connected to the northward with Currituck Sound, and southward with Croatan and Roanoke sounds, and by the latter sounds with Pamlico Sound.

The more important towns on the tributaries of Albemarle Sound are: Elizabeth City, on the Pasquotank River; Hertford, on the Perquimans River; Edenton, on Edenton Bay; Winton, on the Chowan River; Plymouth and Janesville, on the Roanoke River; and Columbia, on the Scuppernong River. There are numerous landings to which light-draft steamers ply when the condition of the rivers permit. During February, March, April, and May fish stakes and nets, in some places, extend across the sound, and it is then impossible for a stranger to navigate the sound without passing through the nets.

The aids to navigation are numerous, and well placed to locate the most dangerous shoals. The rise and fall of the water level depends on the direction of the winds.

SAILING DIRECTIONS, ALBEMARLE SOUND.

The sound is comparatively free from dangers to vessels of the draft that navigate it. There are shoals making from the shore and the points along the shore of the sound. These can generally be avoided by giving the shore, and especially the points, a berth of at least 1 mile.

1. ***Having Come from the Northward.***—Passing out of North River as directed in section 1 (page 53), when ¾ mile southward of North River Lighthouse, proceed according to destination, as follows:

I. ***If bound to Croatan Sound,*** steer **SSE.** for 12 miles to Carôon Point buoy, and proceed as directed in section 2 (page 53).

II. ***If bound to Alligator River,*** a **SSW.** ¼ **W.** course made good for 12 miles will lead up to the Middle Ground buoy (black, No. 1) at the entrance to the river; the buoys will guide into the river, but a stranger bound up the river should take a pilot.

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*Shown on chart 137, scale $\frac{1}{80,000}$, price $0.50.

†Shown on charts 140, 141, scale $\frac{1}{80,000}$, price of each $0.50.

III. ***If bound to Bull Bay,*** make good a **WSW.** course for 23½ miles; then, if bound into the bay, steer **SW.** ¾ **S.** for the Entrance buoy (red, No. 2). Or, if bound into Scuppernong River, steer **S.** by **E.** ¼ **E.** for 1¼ miles to the Entrance buoy (black, No. 1).

IV. ***If bound to Edenton Bay or Mackays Creek or into Chowan or Roanoke rivers.***—With North River Lighthouse bearing **N.** distant ¾ mile, make good a **WSW.** ¾ **W.** course for 35 miles; the vessel should then be 1½ miles distant from the southern shore of the sound and Hornblower Point buoy (nun, red, No. 6) should bear **N.** ¾ **W.** and be 2 miles distant. From this position:

If bound to Edenton, steer **NNW.** for 3½ miles, when the vessel will be on the Edenton Harbor Range. Follow the range and buoys until up to the wharves. (See also the description of Edenton Bay on page 58.)

If bound to Mackays Creek, steer **SW.** by **W.** about 1¾ miles, and when in 13 to 15 feet of water northwestward of the mouth of the creek take a pilot for the dredged channel.

If bound into Chowan River, a **NW.** ½ **W.** course will lead fair into the river, and a stranger bound higher than 5 miles above the entrance should take a pilot. A mid-river course may be followed for a distance of 5 miles. (See also the description of Chowan River on page 58.)

If bound into Roanoke River, steer **W.** for 5 miles to the Entrance buoy (black, No. 1). Strangers should not attempt to enter the river without a pilot. (See also the description of Roanoke River on page 59.)

Remarks.—On the **WSW.** ¾ **W.** course through the sound from North River entrance, Wade Point Lighthouse will be left nearly 1¾ miles, and Reeds Point Beacon (lighted) about ¾ mile on the starboard hand. Having stood 25 miles on this course, Laurel Point Lighthouse should be left nearly ¾ mile on the port hand and about 2½ miles farther along the course, Bluff Point Shoal buoy (nun, red, No. 4) will be left nearly ¾ mile on the starboard hand. The depths along the sailing line will range from 14 to 21 feet. In spring the numerous fish stakes and nets, which are set in the sound, can hardly be avoided.

1 A. ***Having come from the Northward.***—Passing out of Pasquotank River as directed in section 1 A, page 53.

I. ***If bound to Croatan Sound,*** bring Wade Point Lighthouse to bear **NW.** ⅞ **N.** distant ½ mile and steer **SE.** ⅞ **S.** for 14¼ miles until up to Caroon Point buoy; then proceed as directed in section 2, page 53.

II. ***If bound to Alligator River,*** bring Wade Point lighthouse to bear **N.** ½ **E. Easterly,** distant ½ mile and steer **S.** ½ **W. Westerly** for 11 miles until up to Middle Ground buoy (black, No. 1) at the entrance to the river; a stranger should here take a pilot.

III. ***If bound to Bull Bay,*** bring Wade Point Lighthouse to bear **NE.** by **E.** ½ **E.** and steer **SW.** by **W.** ½ **W.** keeping on the bearing until 20½ miles from the lighthouse and Laurel Point Lighthouse bears **NW.** by **W.** and is distant 3¼ miles; then if bound into the bay steer **SSW.** ¾ **W.** for the Entrance buoy (red, No. 2). Or, if bound into Scuppernong River, steer **S.** by **E.** for 1½ miles to the Entrance buoy (black, No. 1).

IV. ***If bound to Edenton Bay or Mackays Creek (Mackeys Ferry) or into Chowan or Roanoke rivers.***—Bring Wade Point Lighthouse to bear **N.** by **E.** distant 2 miles and make good a **WSW.** ¾ **W.** course for 30¾ miles, the vessel should then be 1½ miles from the southern shore of the sound and Hornblower Point buoy (nun, red, No. 6) should bear **N.** ¾ **W.** distant 2 miles.

From this position follow the directions in Section 1, preceding under Paragraph IV. (See also the remarks under this paragraph.)

1 B. ***Having come from the Southward.—Bound to the head of the Sound.***—Passing out of Croatan Sound, when abreast Caroon Point buoy (black, No. 5) steer **NW.** ⅛ **N.** for 5 miles and then **W.** ¾ **N.** about 22 miles until Laurel Point Lighthouse is made, and then change the course westward so as to pass about ¾ mile northward of it.

When the lighthouse bears **S.** steer **WSW.** ¾ **W.** for 10 miles; Hornblower Point buoy (nun, red, No. 6) should then bear **N.** ¾ **W.** and be 2 miles distant; then proceed according to destination as directed in paragraph IV under section 1 preceding.

NORTH RIVER*

empties into the eastern end of Albemarle Sound from northward and is important only as being the southern approach to the route of the vessels using the Albemarle and Chesapeake Canal. The entrance, which is marked by **North River Lighthouse,** is obstructed by shoals through which a narrow dredged channel with a depth of about 8 feet, and marked by range beacons and buoys, leads from the deep water of the sound into the river. From the lighthouse at the entrance to the southern end of the cut which connects the river with Coanjock Bay is 12 miles, and for half this distance the river is from 2¼ to ¾ mile wide; above this the river is narrow and crooked and sailing vessels bound through the canal should take a towboat when this part of the river it reached. **Coanjock** is a post village near the entrance to the cut leading from the river to Coanjock Bay.

PASQUOTANK RIVER†

empties into Albemarle Sound from northward, the entrance marked by **Wade Point Lighthouse** (see table, page 12) is nearly 4 miles westward of North River entrance. The Pasquotank River is the southern approach to the Dismal Swamp Canal, which enters it about 30½ miles above Albemarle Sound at a place known as **Turners Cut.** For a distance of 12 miles above Wade Point Lighthouse the river has a general **NW.** trend with a width of about 1¾ miles and the prominent shoals are marked by buoys, but above this the river gradually narrows and at Elizabeth City, where it makes a sharp bend northward and eastward, it is only about 250 yards wide.

The channel leads into the river eastward of Wade Point Lighthouse and is good for a depth of 9 feet to Elizabeth City and through Turners Cut, which is being improved by dredging.

Elizabeth City is on the west bank of the river 15 miles above Wade Point Lighthouse; it has railroad communication with Norfolk and Edenton and has facilities for making repairs to vessels. There are two marine railways, the largest is capable of hauling out any vessels that (in 1900) navigate the sounds. Coal for steamers can be had alongside the wharves.

The **Dismal Swamp Canal** has a depth of 9 feet when the canal is full; the distance via the canal from Norfolk to Albemarle Sound is about 60 miles, and the size of the locks is length 250 feet, width 40 feet, and depth 10 feet. (See also the description on page 52.)

GENERAL DIRECTIONS ENTERING PASQUOTANK RIVER TO ELIZABETH CITY.

Having come out of North River and being about ¾ mile southward of North River Lighthouse, steer **WNW.** ½ **W.** until Wade Point Lighthouse bears **SW.** distant nearly ½ mile.

Or, having come through Croatan Sound and being abreast of Caroon Point buoy (black, No. 5), steer **NW.** by **N.** for nearly 15 miles, pass about ⅜ mile eastward of Wade Point Lighthouse and bring it to bear **SW.** distant nearly ⅜ mile.

Coming from the westward through Albemarle Sound or from the entrances of its tributaries, when Wade Point Lighthouse is made, steer for it on any bearing between **ENE.** and **N.** and when within 1 mile of it, steer so as to leave the lighthouse nearly ½ mile on the port hand and bring it to bear **SW.** at a distance of nearly ⅜ mile.

With Wade Point Lighthouse bearing **SW.** distant nearly ⅜ mile, steer **WNW.** for 3 miles or until Pocoson Point Flats buoy (red, No. 2) is ¼ mile distant on the starboard beam; then change the course to **NW.** ½ **N.** Continue the latter course (leaving black buoy No. 1 on the port hand and red buoy No. 4 on the starboard hand) for about 8 miles, then turn more westward and follow the middle of the river up to Elizabeth City, taking care to leave the buoys on the side indicated by their color. Or, a mid-river course, if followed above Pocoson Point Flats buoy, will lead in the channel to Elizabeth City.

The depths in following the above directions should range from 10 to 14 feet, except in Shipyard Reach at the lower end of Elizabeth City where the depth is 9 feet, but is being deepened. The channel is broad and free from dangers until nearly up to the city.

*Shown on chart **140,** scale $\frac{1}{80,000}$, price $0.50.

†Shown on charts **140,** scale $\frac{1}{80,000}$, price $0.50; **407,** scale $\frac{1}{60,000}$, price $0.20.

LITTLE RIVER*

empties into Albemarle Sound from northward about 10 miles westward of Wade Point Lighthouse. The entrance is somewhat obstructed by shoals, leaving a channel a little over ¼ mile wide which is marked by several buoys. The river has a general **NW. ½ N.** trend to the village of **Nixonton**, which is 7 miles above the entrance, on the east bank. About 7½ feet can be taken up to the village, but some local knowledge is necessary to carry the best water.

GENERAL DIRECTIONS, LITTLE RIVER TO NIXONTON.

A draft of 7 feet can be taken to Nixonton by following these directions:

From the Eastward.—On the **WSW. ¾ W.** course through the sound, when about 6 miles westward of Wade Point Lighthouse, steer about **NW.** by **W. ¾ W.** until Stevenson Point (entrance) Flats buoy (black, No. 1) is made; then steer for that buoy, and leave it 100 yards on the port hand.

From Stevensons Point (entrance) Flats buoy, steer **WNW. ½ W.** for Mill Point Flats buoy (red, No. 2) which leave close-to on the starboard hand; then keep near the middle of the river until past Trueblood Point (the point on the eastern bank about 1 mile below Nixonton), above which favor the eastern bank up to Nixonton.

Having come through Croatan Sound, when Caroon Point buoy (black, No. 5) bears **W.** distant ¼ mile, steer **NW. ⅛ N.** about 5 miles; then a **NW.** by **W. ¾ W.** course made good for 16½ miles will lead up to Stevenson Point (entrance) Flats buoy (black, No. 1) from which proceed as directed above.

From the Westward.—Pass about ½ mile southward of Reeds Point Beacon (lighted) and then steer **NE.** by **E.** until up to Stevenson Point Flats buoy (red and black horizontal stripes); leave this buoy 200 yards on the port hand and steer **N.** by **W.** to Stevenson Point (entrance) Flats buoy (black, No. 1), from which proceed as directed above.

PERQUIMANS RIVER*

empties into Albermarle Sound from northward, its entrance being 5 miles westward of Little River and 15 miles westward of Wade Point Lighthouse. The river for a distance of 10 miles, to the town of Hertford, is from ¼ mile to 1½ miles wide and has a navigable depth of 9 to 11 feet. Buoys are placed to mark the principal shoals so as to make navigation comparatively easy for a stranger.

The town of **Hertford** is on the west bank 10 miles above the entrance; it ships some lumber by railroad and in barges. Just above the town the river narrows to a shallow stream.

GENERAL DIRECTIONS, PERQUIMANS RIVER.

From the Eastward.—When on the **WSW. ¾ W.** course and Reeds Point Beacon (lighted) is about ¾ mile distant on the starboard beam, steer **NW. ¾ W.**; this course made good for 4¾ miles should lead up to Harvey Point Flats buoy (black, No. 1); leave this buoy 100 yards on the port hand and steer **NW.** by **W. ½ W.** a little over 2½ miles for Blount Point Spit buoy (black, No. 3), from which steer **WNW. ¾ W.** for Grassy Point Spit buoy (red, No. 2). From the latter buoy a **NW. ⅛ W.** course, made good, will lead fair up the river to Hertford, the distance being about 5½ miles.

EDENTON BAY*

is a small bay in the northern shore of Albemarle Sound and near its western end. The entrance and channel are marked by several buoys, and a range is placed to guide to the wharves of Edenton. The depth in the channel is 9 to 10 feet, which has been obtained by dredging. **Edenton** is a small town at the head of the bay about 1½ miles above the entrance; it has railroad communication with Norfolk, and small steamers trading in the sound and its tributaries land freight here to be shipped by rail. Some lumber is shipped from Edenton by railroad and in barges, and the ferry of the Norfolk and Southern Railroad crosses the sound from Edenton to Mackeys Ferry.

CHOWAN RIVER*

empties into the western part of Albemarle Sound from northward and with its tributaries is one of the principal rivers in North Carolina. For a distance of 17 miles above its mouth the river has an average width

*Shown on chart 141, scale $\frac{1}{80,000}$, price $0.50.

of about 1½ miles; above this it is much narrower but has a good channel with a depth of 9 feet for 50 miles above its mouth. **Winton**, a small town, is on the west bank of the river about 37 miles above its mouth; **Colerain Landing** is on the west bank 12 miles above the entrance; the village of **Colerain** is on the hill ½ mile inland.

Meherrin River joins the Chowan from westward about 2½ miles above Winton. The river is navigable for vessels of about 7 feet draft for a distance of 9¾ miles to the village of **Murfreesboro**.

The junction of the **Blackwater** and Nottoway rivers is about 13 miles above Winton. The town of **Franklin**, on the Blackwater River, is 11 miles above the junction and can be reached by vessels of 8½ feet draft; the width of the river is 100 to 275 feet.

Nottaway River is navigable for vessels of 8 feet draft, when the river is not low, for a distance of 12 miles to **Munroe Ferry**; a draft of 4 to 5 feet can be taken up to the ferry at any time of the year.

There are no artificial aids to navigation in Chowan River or its tributaries, and in some parts of the river there are large areas covered with tree stumps which are 4 to 5 feet under water. It is advisable for a stranger to take a pilot at Edenton or at the mouth of the river.

Sailing directions to the entrance of the river are given on page 56.

ROANOKE RIVER*

empties into the southwestern end of Albemarle Sound. The shallow bight at the mouth of the river is known as **Batchelors Bay** and near its eastern part, off the mouth of the river, is **Roanoke River Lighthouse**. Roanoke River, from the confluence of **Staunton** and **Dan** rivers, is 170 miles long to its mouth, and is the approach to a number of small towns and villages to which steamboats run. The river is navigable 8 months of the year for vessels of 5 feet draft to Halifax, and for a draft of 8 feet to Palmyra; a draft of 8 feet can be taken up to Hamilton all the year.

The principal landings on the river and their approximate distance above its mouth are: **Plymouth**, 6 miles; **Jamesville**, 15½ miles; **Williamston**, 31 miles; **Hamilton**, 58 miles; **Palmyra**, 72 miles; **Edwards Ferry**, 90 miles; **Halifax**, 102 miles, and **Weldon**, 111 miles.

The river is subject to frequent and sudden freshets which overflow large areas of the lowland on both of its banks. Sailing vessels seldom go above Plymouth unless they are towed, the upper part of the river, on account of its width and crooked course, being navigated by steamers.

MACKAYS CREEK†

empties into Albemarle Sound from southward about 4½ miles eastward of Roanoke River Lighthouse. The creek is narrow and has a depth of about 11 feet; a channel 140 feet wide and 9 feet deep has been dredged through the bar at the entrance to connect with the deep water in the creek, but this channel has narrowed and shoaled a little. **Mackey Ferry** is a village and post office about ½ mile above the mouth of the creek; scows loaded with lumber are towed from here across the sound to Edenton, where the lumber is shipped by rail; railroad cars and passengers are ferried across the sound between Edenton and Mackey Ferry.

BULL BAY AND SCUPPERNONG RIVER.†

Bull Bay is the bight in the south shore of Albemarle Sound southeastward of **Laurel Point Lighthouse** (see page 12). Several small creeks empty into the western side of the bay, none of which are navigable except for boats. A buoyed channel, with a depth of 8 feet when the water is high, leads through flats to the entrances of these creeks.

Scuppernong River empties into the eastern end of Bull Bay from southward. This river has been improved by the Government and is now navigable for vessels of 7 feet draft a distance of about 16 miles to **Spruill's Bridge**. **Columbia**, to which a draft of 7 feet can be taken, is a village 5 miles above the mouth of the river. A channel, in 1900, about 45 feet wide and 7 feet deep leads through the bar at the entrance from Bull Bay; this channel is marked by two buoys.

ALLIGATOR RIVER‡

empties into Albemarle Sound from southward. The entrance, which is full of shoals through which there is a buoyed channel with a depth of 10 feet, lies 10 miles westward of Croatan Lighthouse, and 12½ miles **SSW.** from North River Lighthouse. For a distance of about 18 miles above its mouth the river has a general **S.** trend, is 2 to 3 miles wide, and has a general depth of 8 to 11 feet. Above this it is narrow and crooked, but 6 feet can be taken 30 miles above the entrance. Near the head of navigation a canal for boats connects Alligator

*The entrance is shown on charts **141**, scale $\frac{1}{80,000}$, price $0.50; **409**, scale $\frac{1}{30,000}$, price $0.10. †Shown on chart **141**, scale $\frac{1}{80,000}$, price $0.50.

‡Shown on chart **140**, scale $\frac{1}{80,000}$, price $0.50.

River with **Mattamuskeet Lake**, on the northern shore of which is the village of **Fairfield**. On the eastern side just inside the mouth of the river is the entrance to **East Lake** and **South Lake**, two unimportant bodies of water having a general depth of about 7½ feet.

Little Alligator River empties into Alligator River from westward, and just inside the entrance. This river has a narrow, crooked channel, with a depth of 6½ feet. **Fort Landing** is a village and post office on the west bank, about 2 miles above the mouth of the Little Alligator River. A draft of 5 feet can be taken about 4 miles above Fort Landing.

CROATAN AND ROANOKE SOUNDS.*

Croatan Sound is the name applied to the body of water lying west of Roanoke Island, and connecting Albemarle and Pamlico sounds. The passage eastward of Roanoke Island is known as Roanoke Sound. Croatan and Roanoke sounds combined are about 7 miles wide, and lie just westward of the beach, which extends for a distance of 12 miles northward of Bodie Island Lighthouse.

Croatan Sound is full of shoals, through which a well-marked channel, with a least depth of 8 feet, at ordinary stages of water, leads from the southeastern extremity of Albemarle Sound into the northeastern part of Pamlico Sound. This channel is the one used by vessels bound through the sounds. The passage through Roanoke Sound has only about 4 feet of water. **Roanoke Island**, which lies between Croatan and Roanoke sounds, is about 10 miles long in a general **NNW.** and **SSE.** direction, and has an average width of about 2 miles. The village of **Manteo** is on the east side, and the post village of **Seyeo** and steamboat landing are on the west side of the island.

Roanoke Sound is shallow, and the passage through can only be used by light-draft craft. A narrow slue channel leads along part of the eastern side of Roanoke Island, but it can only be used by those with local knowledge of the shoals.

The tides are influenced by the winds, as in Albemarle Sound, but a northerly or westerly wind will cause a very perceptible current southward through Croatan Sound, and southerly winds will cause a current northward.

PAMLICO SOUND †

is the largest body of water in North Carolina, and is separated from the Atlantic by a narrow beach extending from Bodie Island Lighthouse to Cape Hatteras, a distance of about 35 miles, and thence in a general **WSW.** direction for about 35 miles. From Croatan Sound, the northeastern outlet of Pamlico Sound, to Core Sound, the southwestern outlet, the distance, following along the middle of Pamlico Sound, is about 60 miles; the greatest width of the sound taken in a **NW.** direction from Cape Hatteras is about 24 miles. Though separated throughout its length from the Atlantic by a narrow beach, which in some places is but ¼ mile wide, there are only three inlets through which vessels can enter from seaward, viz: Oregon Inlet, Hatteras Inlet, and Ocracoke Inlet. These inlets are fully described in another part of this volume.

The northern shore of the sound is irregular, being broken by a number of shallow bays; Middleton and Swan Quarter are the two principal towns on the north shore. The western end of the sound is much broken by the numerous bays and rivers which empty into it; of these the two of greatest importance are Pamlico River and Neuse River. The general depth of water in the middle of the sound is between 3 and 4 fathoms, but the shoals in many places extend many miles from the shore; northward of Ocracoke Inlet, **Bluff Shoal**, with 7 to 10 feet over it, extends directly across the sound in a general **N.** and **S.** direction. The greatest draft that can enter the sound through any of the inlets is about 7 feet; 8 to 9 feet is about the limit of the draft of vessels navigating the sound.

Pamlico Sound has extensive areas devoted to oyster culture and many small vessels are employed in this industry. Steamers from Baltimore and Norfolk that pass through the canals and Albemarle Sound also pass through Pamlico Sound bound to and from the towns on the Pamlico and Neuse rivers. The northeastern entrance to Core Sound is in the southwestern part of Pamlico Sound and affords an inside passage to Beaufort, N. C., for vessels of about 5 feet draft.

Tides.—There is about 2 feet rise and fall of tides at Hatteras and Ocracoke inlets, but in the sound the change in water level depends greatly on the direction of the winds. Northerly and westerly winds lower the water and easterly winds raise the water in the sound. Currents are not noticeable much beyond the bulkheads of the inlets except in the rivers during freshets and in Croatan Sound.

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* Shown on chart **140**, scale $\frac{1}{80,000}$, price $0.50.

† Shown in parts on charts **142**, **143**, scale $\frac{1}{80,000}$, price of each $0.50; **144**[1], **144**[2], scale $\frac{1}{80,000}$, price of each $0.40.

SAILING DIRECTIONS, PAMLICO SOUND.

The following directions are safe for vessels of the greatest draft entering the sound. To pass through Croatan Sound and into Pamlico Sound follow directions in section 2, page 53.

1. ***Eastern portion of the Sound.***—I. ***From Roanoke Marshes Lighthouse.***—Having come through Croatan Sound, as directed in section 2, page 53, and being southward of the lighthouse, bring the lighthouse to bear **N.** distant 1½ miles, and steer **S.** ¾ **E.** for 5¾ miles (Stumpy Point will then be on the starboard beam); then steer **S.** ¼ **W.** for 9½ miles. Long Shoal Lighthouse should then bear **NW.** distant nearly 2¼ miles; from here a **SW.** ⅝ **W.** course made good for 27¾ miles will lead to Bluff Shoal buoy (black and white perpendicular stripes). From this buoy follow the directions in section 2.

After having stood about 17 miles on the SW. ⅝ W. course, Gull Shoal Lighthouse (see table, page 14) should be about 2¾ miles on the starboard beam.

With Long Shoal Lighthouse bearing **NW.** distant 2¼ miles, a **S.** by **W.** ¾ **W.** course made good for 16¾ miles will lead to Hatteras Inlet Lighthouse near the northern entrance of Hatteras Inlet; or, a **SW.** ⅝ **S.** course made good for 29 miles will lead to the buoy at the northern entrance to Teaches Hole Channel at Ocracoke Inlet.

II. ***From Hatteras Inlet.***—Having entered the sound through Hatteras Inlet, if bound to Roanoke Marshes Lighthouse, bring Hatteras Inlet Lighthouse to bear **E.** distant ⅜ mile and make good a **N.** by **E.** ¾ **E.** course for 16¾ miles; Long Shoal Lighthouse should then bear **NW.** distant about 2¼ miles and the course should be changed to **N.** ⅛ **W.** for Roanoke Marshes Lighthouse.

If bound westward through the sound, bring Hatteras Inlet Lighthouse to bear **E.** ⅞ **N.** and steer **W.** ⅞ **S.** with the lighthouse over the stern. This course made good for 16 miles from the lighthouse will lead up to Bluff Shoal buoy, for which follow the directions in section 2 for the western portion of the sound.

Strangers entering or leaving Pamlico Sound through Hatteras or Ocracoke inlets should always take a pilot, as the bars and swashes are subject to frequent changes (see descriptions of Hatteras and Ocracoke inlets).

III. ***From Ocracoke Inlet.***—Having entered through the inlet and passed through Teaches Hole Channel, and being near the buoy at the northern entrance, a **NE.** ⅝ **N.** course made good for 29 miles will lead to a position about 2¼ miles **SE.** from Long Shoal Lighthouse and the course should be changed to **N.** ⅛ **W.** for Roanoke Marshes Lighthouse.

If bound westward, when clear of the shoals bring Ocracoke Lighthouse to bear **SE.** by **S.** and steer **NW.** by **N.** for about 4½ miles from the Entrance buoy; Bluff Shoal buoy should be made right ahead and when up to it be guided by the directions in section 2 following.

2. ***Western portion of the Sound.***—I. ***From Bluff Shoal Buoy to Swan Quarter.***—From Bluff Shoal buoy make good a **NW.** by **W.** ¼ **W.** course for 13 miles; the southern extremity of Great Island (off the eastern side of the entrance to Swan Quarter Bay) will then bear **E.** and the course should be changed to **N.** by **W.** The latter course made good for 2¾ miles will lead to Swan Quarter Island Shoal buoy (white and black perpendicular stripes) and the course should then be changed to **N.** by **W.** ½ **W.**; this course leads close to and eastward of Judith Island Shoal buoy (black, No. 1); from this buoy steer about **NW.** by **N.** and close to and westward of Oyster Creek Shoal buoy (red, No. 2). From the latter buoy steer **N.** by **E.** ½ **E.** about ⅝ mile and then anchor in 9 to 10 feet of water eastward of Judith Marsh Shoal buoy (black, No. 3).

The NW. by W. ¼ W. course leads well northward of the Middle Ground and about 1 mile southwestward of Great Island.

II. ***From Bluff Shoal buoy to Pamlico River entrance, or into Rose Bay.***—From Bluff Shoal buoy steer **W.** ¾ **N.** for 11 miles. Inner Middle Ground buoy (red and black horizontal

stripes) will then bear **N.** distant about 1 mile and a **NW.** ¼ **W.** course made good for nearly 10 miles will lead to a point ¾ mile northward of Pamlico Point Lighthouse and fair into Pamlico River. Now, if bound up the river, follow the sailing directions for that river.

If bound into Rose Bay, when Pamlico Point Lighthouse bears **S.** distant about ¾ mile, steer **N.** ¾ **E.**; Judith Island Shoal buoy (red, No. 2) should be made and left close-to on the starboard hand and the course changed to **NE.** by **E.** ½ **E.** for Marsh Point Shoal buoy (black, No. 1). From this buoy steer **NNE.** ¾ **E.** and be guided by the buoys. Anchor southward of black buoy No. 3.

III. ***From Bluff Shoal buoy to Neuse River entrance, or into Bay River.***—From Bluff Shoal buoy a **WSW.** ¼ **W.** course made good for 11½ miles will lead to a position about ¼ mile **S.** of Brant Island Shoal Lighthouse. From this position a **W.** by **N.** course will lead fair into Bay river entrance, and a stranger going up the river must take a pilot or be guided by the chart and buoys. (See description of Bay River, page 65.)

If bound into Neuse River, having Brant Island Shoal Lighthouse bearing **N.** distant ¼ mile, make good a **W.** ¼ **S.** course for 9¼ miles; Point of Marsh buoy (black, No. 1) should then be on the port beam and Neuse River Lighthouse on the port bow. If bound up the river be guided by the sailing directions for Neuse River.

Brant Island Shoal extends 8½ miles in a **SE.** by **E.** direction from Brant Island and has a depth of 6 to 10 feet on its southeastern half and a depth of 2 to 10 feet on its northwestern half. The lighthouse (see table, page 14) is on the southeastern point of the shoal. About 4½ miles **NW.** by **W.** from the lighthouse a white and black perpendicularly striped buoy marks a channel over the shoal with a depth of 6 feet.

LONG SHOAL RIVER*

is a shallow stream full of oyster beds; the entrance, which is about 1½ miles wide, lies 7½ miles westward of Long Shoal Lighthouse on the north shore of Pamlico Sound. Shoals with 1 to 2 feet of water over them lie on either side of the entrance, but the channel has a depth of about 7 feet for 1½ miles and 5 feet for a distance of 3 miles above the entrance. The points of the shoals at the entrance are marked by buoys, so that a stranger should have no difficulty in entering.

GENERAL DIRECTIONS, LONG SHOAL RIVER.

From a position 2¼ miles **SE.** from Long Shoal Lighthouse steer **WNW.** ¾ **W.** for 9¾ miles; Pains Bay Shoal buoy (red, No. 2) will then bear N. distant about ⅜ mile; haul northward and leave this buoy on the starboard hand, and when it bears **E.** steer **N.** by **W.** up the river.

Or, passing ¼ mile southward of Long Shoal Lighthouse, steer **W.** ¾ **N.**; leave Pains Bay Shoal buoy (red, No. 2) on the starboard hand and steer **N.** by **W.** up the river.

The following courses will lead to a point ⅜ mile eastward of Pingleton Shoal buoy (black, No. 1).—With Hatteras Inlet Lighthouse bearing **S.** by **E.**, make good a **N.** by **W.** course 17½ miles from the lighthouse. From the Mid-channel buoy (white and black perpendicular stripes) at the northern entrance to The Swash at Teaches Hole Channel, Ocracoke Inlet, make good a **NNE.** course for a distance of 25 miles. From a position about ½ mile southeastward of Gull Shoal Lighthouse steer **NNE.** ½ **E.** for 12 miles.

Being about ⅜ mile eastward of Pingleton Shoal buoy, steer **NNW.**, leave Pains Bay Shoal buoy on the starboard hand and Pingleton Point buoy (black, No. 3) on the port hand, and when abreast the latter buoy haul up to **N.** by **W.** The water shoals gradually toward the head of the river.

MIDDLETON ANCHORAGE.*

This is a broad, open bight in the northern shore of Pamlico Sound and lying about 6 miles northward of Gull Shoal Lighthouse. The anchorage has a depth of 9 to 13 feet and is sheltered to the eastward by **Gibbs Shoal**, which has from 1 to 4 feet of water over it, and on which the sea breaks in easterly winds. There is no shelter with the winds from southward. Two post villages, **Middleton** and **Englehart**, are situated a short distance inland from the anchorage.

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* Shown on chart 142, scale $\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS, MIDDLETON ANCHORAGE.

Having come from northward, as described on page 61, when Long Shoal Lighthouse bears **NW.** distant 2¼ miles, a course of **WSW. ½ W.**, made good for 13 miles, will lead up to Gibbs Shoal buoy (black, No. 1); passing southward of this buoy, continue the same course about 1 mile and then steer **NW.**; anchor in 9 to 12 feet of water when about ½ to ¾ mile from the northern shore.

If coming from Hatteras Inlet, bring Hatteras Inlet Lighthouse to bear **SE. ¾ S.** and steer **NW. ¾ N.** Or, if coming from westward, pass about ½ mile eastward of Gull Shoal Lighthouse and steer **N. ¾ W.**; anchor in 9 to 12 feet of water when within 1 mile of the northern shore.

WYESOCKING BAY*

makes into the north shore of Pamlico Sound northwestward of Gull Shoal Lighthouse. The entrance is obstructed by shoals, through which a channel with a general depth of 4 to 8 feet leads into the bay from the sound. Strangers should not attempt to enter without a pilot, as there are no aids that can be readily recognized. At the head of the bay is a boat canal which communicates with Mattamuskeet Lake in the interior.

JUNIPER BAY*

makes into the north shore of Pamlico Sound about 14 miles westward of Gull Shoal Lighthouse. The entrance is about 1½ miles wide, but toward its head the bay narrows gradually and 3½ miles above the entrance it is a narrow, crooked stream. Shoals make off from both shores, but the middle of the bay has a depth of 7 to 10 feet. At the head of the bay is a boat canal which communicates with Mattamuskeet Lake. There are no aids to assist a stranger when entering.

SWAN QUARTER BAY*

makes into the north shore of Pamlico Sound near its western end and about 5 miles eastward of the entrance to Pamlico River. At its entrance the bay is about 2 miles wide, but it contracts gradually toward its head, which is distant about 4½ miles above the entrance. A depth of 8 to 11 feet can be taken up to the town of **Swan Quarter** through the channel, which is well marked by buoys. **Great Island** lies off the eastern side of the entrance. The channel northward of the island is known as **Swan Quarter Narrows** and has a depth of about 6 feet. (For sailing directions see section 2, page 61.)

ROSE BAY*

is an irregularly shaped bay making into the north shore of Pamlico Sound just **N.** of the entrance to Pamlico River. The entrance is about 1¾ miles wide, but shoals making off from both sides leave the channel about ⅝ mile wide. The depth in the channel is 9 feet or more for a distance of 4 miles above the entrance; the principal shoals are marked by buoys for this distance, above which no stranger should attempt to go without a pilot. (For sailing directions see section 2, page 61.)

JONES BAY†

makes into the western shore of Pamlico Sound about 7½ miles southward of the mouth of Pamlico River. The bay is navigable for vessels of 7 feet draft for a distance of 4½ miles above its mouth. The entrance is somewhat obstructed by shoals, through which a buoyed channel leads into the bay.

Between Jones Bay and the south point (**Pamlico Point**) at the entrance to Pamlico River there are several small, shallow bays, which are only frequented by small local craft. Their names, taken from the southward and toward Pamlico River, are: **Middle Bay, Big Porpoise Bay,** and **Mouse Harbor.**

CEDAR ISLAND BAY†

is a large, irregularly shaped body of water making into the western shore of Pamlico Sound southward of Neuse River entrance. The shores of the bay and its numerous branches are marshy, and it is of no importance except for its oyster beds. A depth of 15 to 20 feet can be taken 5 miles into the bay through a narrow and crooked channel. From the southwest branch of the bay, known as **Long Bay,** there is a boat passage into **Thoroughfare Bay,** and thence into Core Sound.

PAMLICO RIVER‡

empties into the northwestern part of Pamlico Sound from northwestward. About 31 miles above its mouth it is known as the **Tar River.** The town of **Washington,** on the east bank 31 miles above the entrance, is

*Shown on chart 143, scale $\frac{1}{80,000}$, price $0.50. †Shown on chart 144², scale $\frac{1}{80,000}$, price $0.40. ‡Shown on chart 144¹, scale $\frac{1}{80,000}$, price $0.40.

considered the head of navigation for sailing vessels. A draft of 7½ feet can be taken to the town. **Greenville** is 19 miles above Washington on the Tar River, and **Tarboro** 41 above Washington. Light-draft steamers go up the Tar River as far as Tarboro when the river is high enough to permit.

The entrance of Pamlico River is about 3½ miles wide, and the river has a straight **WNW.** ½ **W.** direction for a distance of 25 miles, with a channel depth of 12 feet and over, and gradually narrowing to a width of 1 mile. Above this the channel in places has a depth of 7½ feet, and is marked by several buoys and pile beacons.

Below Washington several navigable rivers and creeks empty into Pamlico River, the most important of which are: Pungo River, Goose Creek, South Creek, Bath Creek, and Durhams Creek.

Pungo River empties into Pamlico River from northward about 4 miles above the entrance. For a distance of 8 miles above its mouth Pungo River is about 2 miles wide, and has a depth of 11 to 18 feet in the channel. It then turns eastward and has a general width of 1¼ miles for a distance of 5 miles, and then turns again northward and becomes narrow, with a channel depth of about 8 feet to **Leachville**, a village 18½ miles above its mouth. The channel is well marked by buoys, and can be readily followed by a stranger for a distance of 15 miles. A number of navigable creeks empty into Pungo River and form the approach to villages on their banks. The most important are: **Pungo Creek**, **Pantego Creek**, and **Slades Creek**. These creeks are navigable for vessels of about 5 feet draft, but local knowledge is required to keep in the channel. Pantego Creek empties into Pungo River from northward. On the eastern bank, just inside the entrance of the creek, is the post village of **Belhaven**, which is also the terminus of the Norfolk and Southern Railroad. The channel of the creek has a depth of 10 feet to Belhaven and 8 feet can be taken 2¼ miles above its entrance.

Goose Creek empties into Pamlico River from southward about 6½ miles above its entrance. The entrance to the creek is obstructed by shoals, through which a narrow but deep channel, marked by buoys, leads into the creek, which has a channel depth of 11 feet for a distance of 3 miles. **Campbells Creek**, **Upper** and **Lower Spring Creek**, **Eastham Creek**, and **Snode Creek**, are tributaries which empty into Goose Creek. They are all navigable for small craft.

South Creek and **Bond Creek** empty into Pamlico River from southward about 9 miles above its entrance. These two creeks have a common entrance, which leads southward of **Indian Island** and the shoal connecting the island with **Hickory Point**. South Creek has a least depth of 6½ feet in the channel for 7½ miles to the village of **Aurora**. The channel to the landing on Bond Creek has a depth of 7 feet and is marked by buoys.

Durhams Creek empties into Pamlico River from southward about 17½ miles above its mouth. The creek is navigable for small vessels of 5 feet draft for a distance of 2½ miles above its mouth, and 3 feet draft to **Bonners Bridge**, about 1½ miles farther up. There are no aids to assist a stranger in entering.

Bath Creek empties into Pamlico River from northward, the mouth of the creek being directly **N.** from the mouth of Durhams Creek. A draft of 6½ feet can be taken to the village of **Bath**, about 1¾ miles above its mouth, and a draft of 4½ feet can be taken about 4 miles above the entrance. There are no aids to assist a stranger in entering.

GENERAL DIRECTIONS, PAMLICO RIVER TO WASHINGTON.

Sailing directions for Pamlico Sound and to the entrance of Pamlico River are given on page 61.

Entering the river on a **NW.** ¼ **W.** course, and leaving Pamlico Point Lighthouse ½ mile on the port hand when it is abeam, as directed in paragraph II, page 61, continue that course until the old tower on Pamlico Point bears **S.** distant 1¾ miles; then change the course to **WNW.** ⅝ **W.** up the river. On this course Pungo River Beacon will be left 1 mile on the starboard hand and Indian Island Shoal buoy (black, No. 1) will be left about ¼ mile on the port hand. Rumley Marsh Shoal buoy (red spar, No. 4) will be made a little on the starboard bow. Pass about 300 yards southward of Rumley Marsh Shoal buoy and then make good a **WNW.** course, leaving Core Point Shoal buoy (black spar, No. 3) and Maul Point Shoal buoy (black spar, No. 5) about 400 yards on the port hand. When abreast the last-named buoy steer **W.** ½ **N.** so as to pass about 100 yards southward of Middle Ground buoy (red, No. 6), and from it a **NW.** course will lead to Broad Creek Shoal buoy (red, No. 6¼); leave this buoy 40 yards on the starboard hand and steer **NW.** ½ **W.** Leave Fork Point Shoal buoy (black, No. 7) about ¼ mile on the port hand and steer **NW.** ⅝ **N.** for McWilliams Point Shoal pile buoy (with red lantern light at night), from which point be guided by the buoys to Washington.

The above directions are safe for a vessel of 7½ feet draft.

GENERAL DIRECTIONS, PUNGO RIVER.

Directions for passing into Pamlico River are given on pages 61, 62. Pass ½ mile northeastward of Pamlico Point Lighthouse and make good a **NW.** course for 7¼ miles to Currituck Point buoy (red, No. 2). When this buoy is seen it should be steered for so as to leave it on the starboard hand. Strangers must be guided by the buoys; the courses from buoy to buoy are about as follows: From Currituck Point buoy **N.** by **W.** ¾ **W.** nearly 3 miles, leaving Grassy Point buoy on the port hand and red buoy No. 4 on the starboard hand; from the latter buoy steer **N.** by **E.** 1⅜ miles to red buoy No. 6; then **NNW.** ¾ **W.** nearly 2¼ miles (leaving black buoy No 3 on the port hand) to red buoy No. 8; if bound to Belhaven, see directions for Pantego Creek. From red buoy No. 8 steer **N.** ½ **E.** to red buoy No. 10; then **E.** by **S.** nearly 1¾ miles to black buoy No. 5; after passing the latter buoy haul more eastward, and after passing black buoy No. 7 steer **ESE.** ¾ **E.** for black buoy No. 9, and from the latter steer **NE.** ¼ **N.** fair between black buoy No. 11 and red buoy No. 12, above which there are no buoys, and a pilot should be taken if bound to Leachville.

Extensive shoals make out from most of the points of the river and a vessel should follow closely the channel marked by the buoys.

To enter Pantego Creek.—If bound to Belhaven, follow the above directions until red buoy No. 8 is on the starboard beam and continue on the **NNW.** ¾ **W.** course until up to the entrance of the creek, then steer **NW.** ¾ **N.** for the outer end of the railroad wharf (this will be a mid-channel course into the creek). Anchor in mid-channel just above the wharf.

BAY RIVER*

empties into the western part of Pamlico Sound from westward, the entrance being just north of the mouth of the Neuse River and about 5 miles **NNE.** from Neuse River Lighthouse. The entrance is about 1¾ miles wide, but the river narrows gradually toward its head, and, at the village of **Jackson** (post-office name, **Bayboro**), 13½ miles above its mouth, it is a narrow stream. For a distance of 5 miles from the entrance the most prominent shoals are marked by buoys, but above this there are no aids to assist a stranger. A depth of 12 feet can be taken 6 miles up the river, but only about 6 feet can be taken to Jackson. (For sailing directions to the entrance of Bay River see section 2, page 62.)

GENERAL DIRECTIONS, BAY RIVER.

Having followed the directions in paragraph III, page 62, approach the entrance carefully, as the shoals rise abruptly and the land is too low to afford any good marks. When Neuse River Lighthouse bears about **SW.** ¾ **S.**, distant 4½ miles, black buoy No. 1 should be in line with the lighthouse and distant 1 mile. From this position a **NW.** by **W.** ½ **W.** course should lead fair into the entrance of the river, leaving black buoys Nos. 3 and 5 on the port hand. Continue this course ¾ mile past black buoy No. 5, and then steer **SW.** by **W.** ¾ **W.** for 2 miles and leave red buoy No. 2 on the starboard hand. Above buoy No. 2 a general midriver course will lead in the channel for a distance of about 6 miles.

NEUSE RIVER*

empties into the western end of Pamlico Sound from westward and is one of the most important rivers in North Carolina. The entrance, which is about 12 miles southward of Pamlico River entrance, is 5 miles wide and just inside, on its northern side, is **Neuse River Lighthouse.** Sudden and frequent freshets occur in the upper part of the river above Newbern, but they do not interfere with navigation to that port. When the river is not low, light-draft steamers sometimes go up the river as far as **Kinston,** 71 miles above the entrance. The city of **Newbern,** on the west bank, 34 miles above the entrance, has steamboat communication with Elizabeth City, Belhaven, and with a number of landings on the river and its tributaries. It has facilities for light repairs to vessels and a limited supply of anthracite and bituminous coal for steamers. For a distance of 25 miles above its mouth the river has a width varying fron 5 to 1¾ miles and a channel depth of over 13 feet; above this the width of the river decreases and the channel, which leads among shoals, has a depth of about 8 feet to Newbern. From the entrance to the city of Newbern the channel is marked by beacons and buoys and **Neuse River Lighthouse,** which is on the end of a spit making off from the north shore of the river about 2 miles above its entrance.

* Shown on chart 144², scale $\frac{1}{80,000}$, price $0.40.

Contentnia Creek, one of the important tributaries, enters the Neuse River about 27 miles above Newbern A draft of 3 feet can be taken up to **Snow Hill**, about 28 miles above its mouth.

Trent River empties into the Neuse at the southern end of the city of Newbern. Its least channel depth for a distance of 15½ miles to **Pollocksville** is 8 feet; to **Quaker Bridge**, 21½ miles above Newbern, 6 feet; and to **Trenton**, 32½ miles above Newbern, 2½ feet.

A number of navigable tributaries empty into the Neuse between its entrance and Trent River. **Turnagain Bay**, which empties into the Neuse from southward, is navigable for a distance of 3 miles by vessels of 6 feet draft. The entrance lies **S.** by **E.** from Neuse River Lighthouse and has a narrow channel.

Broad Creek empties into the Neuse from northward; the entrance, which is marked by two stakes, lies 1¾ miles **W.** ½ **N.** from Neuse River Lighthouse. A draft of 6½ feet can be taken about 2½ miles up the creek through a narrow, unmarked channel.

South River empties into the Neuse from southward; the entrance lies about 6¼ miles **SSW.** from Neuse River Lighthouse. The channel has a depth of 10 feet for about 5 miles and 7 feet for 1½ miles farther. At the entrance are several buoys placed to mark the channel, which is narrow.

Oriental is a post village and landing on the north bank of the Neuse River at the mouth of Smith Creek and about 8¼ miles above Neuse River Lighthouse.

Adams Creek empties into the Neuse from southward; the entrance is about 5 miles westward of South River entrance. Between Adams Creek and South River entrances a shoal extends northward over halfway across the Neuse River. About 7 feet draft can be taken 4½ miles up Adams Creek, but there are no aids to assist a stranger.

Clubfoot Creek empties into the Neuse River from southward about 14 miles above Neuse River Lighthouse. The channel at the mouth of the creek is narrow, but a draft of 5 feet can be taken 3 miles up the creek. The **Clubfoot and Harlow Canal**, with a depth of 3½ feet at high water, extends from the head of Clubfoot Creek to Harlow Creek and forms a part of the passage for boats from the Neuse River to Beaufort Harbor, N. C. The distance from Newbern to Beaufort by this route is about 33 miles, and by the route through Core Sound about 78 miles.

Slocums Creek empties into Neuse River from southward, about 6¼ miles above the mouth of Clubfoot Creek. It is narrow and crooked, but a draft of 5 feet can be taken about 1 mile into the creek.

Goose Creek empties into the Neuse River from northeastward, about 6 miles below Newbern. About 7½ feet can be taken into the creek.

Upper Broad Creek entrance is just above the entrance to Goose Creek. About 9 feet can be taken into the creek.

GENERAL DIRECTIONS, NEUSE RIVER.

Directions to the entrance of the river are given in paragraph III, page 62.

From Point of Marsh buoy (black, No. 1), which should be left 200 yards on the port hand, make good a **SW.** by **W.** ¼ **W.** course; Neuse River Lighthouse will be left ¾ mile, and Gum Thicket Shoal buoy (red, No. 2) ½ mile on the starboard hand, and Garbacon Shoal buoy (black, No. 3) about 300 yards on the port hand. Having made good the course for 17½ miles, the stretch of the river northwestward will be opened out, and Wilkinson Point Shoal beacon (lighted) will bear about **WNW.**; the course should then be changed to **WNW.** ½ **W.**, leaving the beacon on the starboard hand. Otter Creek beacon (lighted) will be made nearly ahead and should be steered for. When up to this beacon pass close southward of it, and steer **NNW.** This course should lead about 300 yards westward of Hampton Shoal buoy (red, No. 8), and 300 yards eastward of Johnson Point beacon (lighted). When abreast the latter beacon steer **NW.** ⅝ **N.** for Hanging Point buoy (red, No. 10), leaving Lower Green Spring beacon on the port hand. From the latter beacon the channel is crooked and narrow, and vessels must be guided entirely by the buoys, which are numerous.

CORE SOUND*

is a narrow and shoal body of water extending along and just inside the beach for a length of 27 miles, from the southwest end of Pamlico Sound to a point inside Cape Lookout. At its western end Core Sound joins a similar body of water known as Back Sound, which extends westward about 6 miles and connects with Beaufort Harbor and Inlet. By means of these sounds and their connections the inland passages already described are made continuous as far as Beaufort, but Core Sound is so shallow as to be usually available for

*Shown on charts 146, scale $\frac{1}{80,000}$, price $0.50; 421, scale $\frac{1}{40,000}$, price, $0.20.

a draft of 5 feet only, and that with difficulty. With southerly or westerly winds only 4 feet can be taken through with certainty, but after a strong northeasterly gale it is possible that a draft of 6 feet may pass through. The trend of the sound throughout its length is very straight, a little southward of **SW.** Its width also is quite uniform, varying from 2 to 3 miles.

The greater part of Core Sound is filled with shoal banks which have from 2 to 4 feet of water over them, but a channel winds through it with a general depth of from 7 to 10 feet. In places this channel is extremely narrow, and there are three bars over which it is difficult to take more than 5 feet, and high water is required for that. These bars are situated as follows: **Harbor Island Bar,** at the entrance from Pamlico Sound; **Piney Point Shoal,** off **Piney Point,** about 15 miles down the sound; **Yellow Shoal,** off **Bells Point,** 6 miles farther southward and westward.

The channel is quite well marked by stakes, etc. At its eastern end is **Harbor Island Lighthouse.** The stakes are placed on either side of the channel, and in some places in the middle. The fair way stakes have a cross board painted black and white; those on the sides have boards pointing toward the best water, painted red on the starboard side and black on the port, going westward.

It would hardly be possible for a stranger drawing 4½ feet or over to pass through the sound without getting aground. A pilot, therefore, is recommended. One can always be had from Hatteras or Ocracoke inlets for a reasonable price. **Wainwright Slue** is a convenient anchorage. This is a narrow slue, with 9 to 11 feet of water, making into the sound between the shoal bank off Core Beach and that lying across the entrance to Core Sound. Its entrance is marked by a spar buoy (black, No. 1). This is in 10 feet of water, and must be left close-to on the port hand when entering the slue from Pamlico Sound.

The commerce of Core Sound is confined to a few sharpies carrying fish, oysters, produce, and the mail from Beaufort to Ocracoke and intermediate points.

With the exception of **Thoroughfare Bay** the tributaries emptying into Core Sound are of no importance; they are all shallow and only fit for small boats. Thoroughfare Bay is connected with **Cedar Island Bay** by a narrow passage, and this forms a boat route into Pamlico Sound near the mouth of the Neuse River.

Back Sound is the name given to the shallow body of water back of the beach, extending from Cape Lookout to Beaufort Harbor entrance. The sound is about 2 miles wide, but a shallow bar in Core Sound prevents it from being used by anything except boats on the passage to or from Beaufort. On the northern side of Back Sound is **Harkers Island,** and northward of this island is the staked channel known as **The Straits,** which leads from Core Sound to Beaufort Harbor.

INLETS AND INLAND WATER WAYS FROM BEAUFORT TO CAPE FEAR.

BOGUE SOUND *

is a narrow and unimportant body of water, extending along the coast 21 miles from Beaufort Harbor to Bogue Inlet, separated from the sea by a narrow strip of land called **Bogue Banks.** The greatest width of this sound is 2 miles; its average width but little more than 1 mile. It is for the most part very shallow, and the narrow and crooked channel running through it is obstructed by extensive shoals, so that only 4 feet can be taken through by pilots. The only place of any importance on the sound is Morehead City, which is described in another part of this volume. Numerous small and unimportant water courses enter the sound from northward; the largest of these, with their respective distances from Morehead City, are as follows: Peltiers Creek, 4 miles; Spooners Creek, 5 miles; Gales Creek, 10 miles; Broad Creek, 12 miles; Sanders Creek, 14 miles; Goose Creek, 16 miles; Deer Creek, 18 miles. Beyond Deer Creek the sound is filled with marshes traversed by a maze of winding creeks. The principal passages through these marshes are called **Burthen Channel, Bank Channel,** and **Cross Stake Channel.** Following any of these will lead into a comparatively wide and open channel which leads through the marshes from Bogue Inlet to White Oak River.

BOGUE INLET.†

lying 21 miles westward from Beaufort entrance, serves as an outlet to the interior waters skirting the coast as well as to White Oak River. The opening of the Inlet is about ¾ mile wide; it is fully described on page 51.

White Oak River at its mouth has a width of 1 mile, and narrows gradually in a length of 7 miles to a very small stream. It takes its rise in the swamps that are drained also northward by tributaries of the Trent River that joins the Neuse River at Newbern.

FROM BOGUE INLET TO NEW RIVER INLET.‡

Back of the beach between Bogue Inlet and New River Inlet, a distance of about 13½ miles, is a marsh which is traversed by a network of narrow and shallow creeks and slues which form a continuous passage, with a least depth of ½ foot, used only by small boats.

* Shown on chart 147, scale $\frac{1}{80,000}$, price $0.50. † See footnote on page 51. ‡ Shown on chart 148, scale $\frac{1}{80,000}$, price $0.50.

FROM NEW RIVER INLET TO MASONBORO INLET.*

Near the entrance of New River the inlet communicates, through **Chadwick Bay** and a number of narrow winding creeks, which flow through marshes, with **Stump Sound**. This name is applied, for a distance of about 11 miles, to the shallow irregular bodies of water which skirt the coast and extend westward of New River Inlet. For a distance of 12 miles westward of Stump Sound these waters are known under the name of **Topsail Sound**, and thence to Masonboro Inlet, a distance of about 5 miles, under the general name of **Middle Sound**. These sounds extend through the marshes lying just back of the beach, and where the open water is of any extent they are called bays. Only small boats can pass through the sounds and it is necessary to know the locality to be able to find sufficient water to keep afloat.

There are several swashes and inlets through which the sounds can be entered from sea; these have shifting bars and are only used by small local craft which enter the sounds for anchorage. A depth of from 5 to 9 feet can be found inside of some of the inlets but this is a greater depth than can be taken over the bars.

There are no villages or towns on these waters except **Wrightsville**, 2½ miles northward of Masonboro Inlet, and **Masonboro**, 1½ miles westward of the inlet.

FROM MASONBORO INLET TO CAPE FEAR.†

Masonboro Sound is the name applied to the irregular, shallow body of water extending 3 miles in a southwesterly direction from the town of Masonboro; its western end joins **Myrtle Sound**, another shallow body of water, which extends 6 miles in a southwesterly direction back of the beach. These sounds are navigable only for boats; their eastern shores are low sandy beach and marsh; and the western shores are generally wooded.

COAST FROM CAPE FEAR TO ST. JOHNS RIVER ENTRANCE.‡

Cape Fear to Winyah Bay.—From Cape Fear the coast trends first in a northwesterly direction, then curves gradually westward and southward to the entrance to Winyah Bay, forming a semielliptical shore to a part of the Atlantic Ocean called **Long Bay**. Georgetown Lighthouse, at the entrance to Winyah Bay, bears **SW.** by **W.** distant 71 miles from Cape Fear Lighthouse, but the shore between the same lighthouses is 80 miles in length, and consists of low sand beach (with numerous small sand hills) separated from the heavily wooded mainland by small streams and marsh; when seen from a distance the woods appear to extend to the water.

The entrance to Cape Fear River (see description), just westward of the cape, is the only important break in this stretch of coast, but there are numerous small shallow and unimportant breaks which, named in order from the northward with their distances, in miles, from Cape Fear Lighthouse are: Lockwood Folly Inlet, 12; Bacon Inlet, 16½; Shallotte Inlet, 18½; Tubb Inlet, 23½; Mad Inlet, 27; Little River Inlet, 27½; Hog Inlet, 30; Cherry Grove Inlet, 31; White Point Swash, 37; Kettle Swash, 38; Singleton Swash, 40; Cane Patch Creek, 41; Eight Mile Swash, 46; Murrell Inlet, 56; Midway Inlet, 61; Pawly Inlet, 63; North Inlet, 65. The depths in the channels across the bars at these inlets are liable to be changed by southeast gales; the most important are **Lockwood Folly Inlet** and **New River Inlet**.

From Cape Fear River Entrance to Winyah Bay Entrance the coast is quite bold-to and 4 to 6 fathoms can be taken as close as 1 mile to the beach; the 10-fathom curve is from 18 to 21 miles offshore and inside of it the water shoals gradually as the shore is approached.

Winyah Bay to St. Johns River Entrance.—This section of the coast, nearly 220 miles in length, formed almost wholly by islands and by long strips of land partially separated from the mainland by marshes and lagoons, is broken by numerous large sounds, rivers, and inlets and is consequently very different from the stretches of coast northward previously described. The most important bodies of water forming these breaks are described under separate headings in another part of this volume, but are here mentioned in order from northward: North Santee River, South Santee River, Bull Bay, Charleston Harbor, Stono Inlet, North Edisto River, St. Helena Sound, Port Royal Sound, Tybee Roads, Wassaw Sound, Ossabaw Sound, St. Catherines Sound, Sapelo Sound, Doboy Sound, Altamaha Sound, St. Simon Sound, St. Andrew Sound, Cumberland Sound, St. Marys Entrance, and Nassau Sound. It should be remembered that the entrances to nearly all the above-mentioned waters are obstructed by shifting bars across which the channels lead, and that the best directions for entering are to take a pilot.

The great similarity in appearance, when seen from seaward, of different parts of this coast renders it almost impossible to recognize the localities after the land is made, unless some artificial landmark can be

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*Shown in parts on charts **148, 149**, scale $\frac{1}{80,000}$, price of each $0.50.

†Shown on chart **149**, scale $\frac{1}{80,000}$, price $0.50.

‡Shown in parts on charts **11, 12, 13**, scale $\frac{1}{400,000}$, price of each $0.50; **150, 151, 152, 153, 154, 155, 156, 157, 158**, scale $\frac{1}{80,000}$, price of each $0.50.

seen. In running along outside the shoals the general appearance presented is a low white sand beach backed by heavy woods, or broad openings with nothing visible in the background.

There are a number of lighthouses along the coast, but the only natural landmark is **Mount Cornelia** on Fort George Island and about 2¼ miles northward of St. Johns River entrance.

Along almost this entire stretch of coast, shoals make off for a distance of from 5 to 7 miles. The distance of the 10-fathom curve from the shore varies from 13 to 26 miles, and of the 20-fathom curve from 35 to 55 miles.

In approaching from seaward attention to the lead should insure safety, as the water shoals quite regularly inside of the 20-fathom curve; if the weather is at all thick rely on the lead and do not try to sight the land.

CAPE FEAR RIVER AND WILMINGTON HARBOR.*

Cape Fear River, which empties into the ocean just westward of Cape Fear, is the most important river in North Carolina and the only one that flows directly into the ocean. It derives its importance from being the approach to the city of Wilmington, which is 27 miles above its mouth and is the most important port in the State. Just above the city of Wilmington is the mouth of the **Northeast Branch** of the Cape Fear River; the main river takes a northwesterly direction, and for a short distance above the junction of the Northeast Branch it is known as the **Northwest Branch.** Both the main river and the Northeast Branch are being improved by the Government. It is said that a depth of 2 feet can be taken 55 miles above Wilmington in the Northeast Branch, and a depth of 6 feet to Bannermans bridge, about 40 miles above Wilmington. **Fayetteville** is a large town on the Cape Fear River about 98½ miles above Wilmington; a depth of 4 feet can be taken 42 miles, and 2½ feet about 62 miles up the river to **Elizabethtown,** and from thence 1¼ feet to Fayetteville. **Black River,** which empties into the Cape Fear River 12 miles above Wilmington, has a least depth of 1½ feet in the channel for a distance of 54 miles above its mouth and is being improved by the Government; for a distance of 21 miles the channel depth is 4 feet. Just inside the mouth of the Cape Fear River, on the west bank, is the town of **Southport,** which is of little commercial importance.

The river below Wilmington and its entrance from the sea are being improved by the Government and at present (1900), at high water, a draft of 21 feet can be taken over the bar, and 19½ feet through the dredged cuts to the city of Wilmington. The bar at the entrance extends about 2 miles seaward and its channel is subject to frequent changes, but a depth of 15 to 17 feet is maintained by dredging.

Prominent features.—The entrance to the river is marked by **Cape Fear Lighthouse,** which is on the southeastern side; on the northwestern side is **Fort Caswell.** The range beacons for crossing the bar and standing into the river are all on the eastern side of the entrance, northward and northeastward of the lighthouse; they can be readily picked up when off the entrance buoy.

Anchorages.—The best anchorage is off the town of Southport, where the depth ranges from 4 to 6 fathoms and the bottom is good holding ground. This anchorage is sometimes used as a harbor of refuge in the winter by coasting vessels. There is good holding ground and a depth of 4 to 8 fathoms abreast the city of Wilmington.

National Quarantine.—The quarantine and boarding station is on the east side of the channel about 1 mile above Southport. See National Quarantines in Appendix IV.

Pilots and Towboats.—Pilotage is compulsory for all unlicensed vessels over 60 tons register. (See Pilot Laws in Appendix I.) Pilots for Southport or Wilmington will usually be found off the entrance or they will come out to a vessel signaling for one while outside the bar. Towboats are generally used by the larger class of sailing vessels and can be had at Southport or Wilmington.

Harbor Regulations and Wharves.—The harbor master at Wilmington has control of the berthing and anchorage of all vessels. (See the harbor regulations in Appendix I.) The depth alongside the wharf at Southport is about 15 feet and at Wilmington 15 to 20 feet.

Supplies.—Provisions and ship chandler's stores can be had at Wilmington; coal for steamers can be had alongside the wharves or out in the stream from lighters. Fresh water can be had from a water boat or alongside the wharves through pipe and hose; it is also taken from the river opposite Wilmington.

Repairs.—Light repairs to the machinery of steamers can be made at Wilmington; there is a marine railway here capable of hauling out vessels of about 500 tons register.

Storm-Warning Displays of the United States Weather Bureau are made at Wilmington, Southport, and on Oak Island.

Hospital.—The U. S. Marine Hospital is located at Wilmington. (See Appendix IV.)

*Shown on chart **150,** scale $\frac{1}{80,000}$, price $0.50; and in parts on **424, 425,** scale $\frac{1}{40,000}$, price of each $0.50.

Tides.—The mean rise and fall of tides on the bar is 4.5 feet and at Wilmington 2.4 feet. High water occurs at Wilmington 2 hours 22 minutes later than at Southport, and at the latter place 16 minutes later than at Charleston. (See tide table on page 10.)

Currents.—The tidal currents on the bar run with considerable velocity and as a rule set nearly in the direction of the channels, but on the last of the flood and first of the ebb they tend more or less across the shoals. In the river their set is generally in the direction of the channel and during freshets the ebb has great velocity, sometimes entirely overcoming the flood. At ordinary times a strong flood is felt for a considerable distance above Wilmington, where it runs 4¾ hours to nearly 7¾ hours of ebb; going down the river from Wilmington the periods of flood and ebb become more nearly equal.

SAILING DIRECTIONS, CAPE FEAR RIVER.

Caution.—Constant dredging is necessary to maintain the depth and direction of the channel over the bar, and if the work of dredging is suspended the channel will change. The buoys are placed to indicate the channel, but a stranger of over 12 feet draft should not attempt to enter without a pilot. The dredged cuts in the river are narrow, and though marked by beacons and buoys local knowledge is required for the navigation of the river on account of the buoys occasionally being out of position. In July, 1900, the following directions led in the best water and could be used by strangers of 12 feet or less draft; pilots, at high water, could take 21 feet in over the bar and 19½ feet up to the city of Wilmington. A stranger following these directions must exercise care and depend entirely on the buoys and ranges, which are shifted as occasion requires to indicate the channel.

1. ***Approaching from the Northward and Eastward.***—Coming from the northward and down the coast be guided by the directions in section 2, page 38, until up to Frying Pan Shoals Light-vessel (see table, page 16); passing close on either side of this light-vessel, steer **WNW.** for 6 miles and then change the course to **NNW.** The latter course will lead about 1 mile southwestward of Frying Pan Shoals whistling buoy, and made good for 15¾ miles should lead about 1 mile outside of Cape Fear Entrance bell buoy; if the Entrance bell buoy is not made, bring Cape Fear Lighthouse to bear **NE.** by **E.** ⅝ **E.** and stand for the lighthouse on this bearing until on the New Channel Range (see table, page 16), then follow the directions in section 2.

Remarks.—Frying Pan Shoals are described on page 39; in passing along westward of these shoals precaution should be taken against being set off the sailing line by the currents which set across the shoals with considerable velocity, the ebb setting eastward and the flood westward.

1 A. ***Approaching from the Westward.***—After passing Winyah Bay entrance there are no outlying dangers and a vessel may follow the shore, giving it a berth of 1½ miles, and have depths of 3 fathoms or more. A depth of 4 to 5 fathoms may be carried from 1½ to 7 miles from the shore, and deep-draft vessels should not approach the shore closer than 7 miles to insure depths of 6 to 7 fathoms.

With Cape Romain Lighthouse bearing **NNW.** distant about 7 miles a **NE.** ⅝ **E.** course will lead clear of Cape Romain Shoal, and if made good for 84 miles should lead to Cape Fear Entrance bell buoy. Or, when well westward of the entrance and in sight of Cape Fear Lighthouse, bring it to bear **NE.** by **E.** ⅝ **E.** and stand for it until up to the bell buoy. When up to this buoy follow the directions in section 2.

In heavy weather deep-draft vessels should give Cape Romain a berth of 10 miles or more to avoid spots with 25 and 27 feet over them which lie outside the main part of Cape Romain Shoal. There is a 30-foot spot 14 miles **ESE.** ¾ **E.** from Cape Romain Lighthouse.

Remarks.—In approaching the entrance on the **NE.** ⅝ **E.** course Cape Fear Lighthouse should be made nearly ahead, a little on the starboard bow. At night a good lookout should be kept for the range lights, and Cape Fear Lighthouse should be brought on a **NE.** by **E.** ⅝ **E.** bearing and be steered for while the vessel is in over 6 fathoms of water. As soon as the New Channel Range (two white lights) comes in range the vessel should be close to the bell buoy.

2. ***Entering and to the Anchorage off Southport.***—Having followed the directions in sections 1 or 1 A until up to Cape Fear Entrance bell buoy, bring the beacons of the New Channel Range (white framework structures northward of the lighthouse) in range ahead and stand in on the range, course about **NE.** by **E.** ½ **E.** Leave black buoys Nos. 1 and 3 about 30 yards on the port hand and red buoys Nos. 2, 4, and 4½ about the same distance on the starboard hand and continue on the range until the vessel is on the Bald Head Range (two white framework structures, the front one ¼ mile westward and the rear one 600 feet northward of the lighthouse), then stand in on the Bald Head Range, course about **ENE.** ⅝ **E.**, leaving black buoy No. 5 about 30 yards on the port beam and red buoy No. 6 on the starboard hand. When past this buoy and on the Smith Island Range (two red pile beacons with lanterns on top) stand in on this range, course about **NE.** ⅛ **N.**, until the white framework beacons bearing **NNW.** ¼ **W.** from the lighthouse are in range with the lighthouse and then steer **NNW.** ¼ **W.**, keeping the beacons and lighthouse in range astern. Leave black buoy No. 7 on the port hand, pass about 200 yards eastward of the wharf at Fort Caswell, and leave red buoy No. 6¼ about 150 yards on the starboard hand. When about 400 yards above this buoy turn slowly with a port helm so as to pass about 300 yards from the end of the largest wharf at Southport. Anchor here in 4 to 5½ fathoms water, or proceed as directed in section 3 following.

Remarks.—A stranger must be careful to use the proper ranges. Some of the old range beacons were still standing in May, 1900, and these beacons are easily mistaken for the new ones. The bell buoy off the entrance is placed very close to or on the range of the New Channel Range beacons; about 200 feet southward of the front beacon of the New Channel Range is a white framework beacon which belongs to the old range; this beacon is flat-topped and stands on four piles and is nearer the lighthouse. The Bald Head Range beacons are well southward of the New Channel Range beacons and should be readily distinguished from the bell buoy at the entrance. The beacons of the old Smith Island Range are eastward of the beacons of the present range; they are red in color and have the same general appearance as the present range beacons, except that they have no lanterns on top.

On the **NNW.** ¼ **W.** course, with the front beacon of New Channel Range in range over the stern with Cape Fear Lighthouse, Fort Caswell will at first be on the port bow and will be left on the port hand; **Battery Island** will be on the starboard bow with Southport showing over and westward of it. When abreast of Battery Island, red buoy No. 6¼ will be left on the starboard hand.

Dangers.—**Extensive shoals** lie in and extend 2 miles off the entrance to Cape Fear River, and the channel over the shallower part of the bar is quite narrow.

Middle Ground is the name given to that part of the shoal lying directly in the center of the entrance between Smith Island and Oak Island; the depths on it range from 2 to 13 feet, the average depth being about 5 or 6 feet. In 1900 this shoal is gradually working southward and encroaching on the line of the New Channel Range abreast of Pile of Stones buoy.

Bald Head Shoal and **The Fingers** make off southwestward from Smith Island and lie southeastward of Bald Head Channel, and rise rather abruptly from the edge of that channel.

Pile of Stones, with a depth of 2½ feet over them, lie about ⅝ mile **WSW.** ½ **W.** from the lighthouse and a little southward of the Bald Head Range; a buoy (red, No. 6) is placed on the north side of the rocks.

Battery and Striking Islands lie in the middle of the river southeastward of Southport and northeastward of Fort Caswell. Extensive shoals surround the islands and the channel leads along southward and westward of them. Above Fort Caswell these shoals and the shoals lying off the mouth of **Elizabeth River** and **Dutchman Creek** (both of which enter Cape Fear River from westward between Fort Caswell and Southport) rise very abruptly from the deep water of the channel and mark, fairly well, its edge at extreme low water.

3. ***From Southport to Orton Point.***—Having followed the directions in section 2, when abreast of and 300 yards from the largest wharf at Southport steer **ENE.** for about ⅞ mile, heading for the northern end of the Quarantine Station; when the station is about ¼ mile distant haul a little northward so as to leave it 150 yards on the starboard hand. When abreast of the Quarantine Station steer **NE. Northerly**; leave red (lighted) beacon No. 2 about 275 yards on the starboard hand and a 3-pile white beacon about 200 yards on the port hand. Continue the **NE. Northerly** course until up to black buoy No. 9, which should be left on the port hand, and with the 3-pile white beacon in range with a 1-pile white beacon on shore steer about **NE.** by **E.** ⅛ **E.**, keeping the beacons in range astern until up to black buoy No. 11, which should be left about 30 yards on the port hand. From this

buoy the course is about **NE. ⅛ E.**, keeping two red beacons in range ahead until up to black buoy No. 13, which should be left 30 yards on the port hand. From black buoy No. 13 steer about **NNE.** so as to leave red buoy No. 6½ on the starboard hand and red buoy No. 8 on the starboard hand. When abreast red buoy No. 8 steer about **N. ½ E.**, keep two white beacons in range ahead and leave red buoy No. 10 about 30 yards on the starboard hand; when ¼ mile north of this buoy steer about **N.** by **E. ⅝ E.**; leave white beacon No. 6 about 150 yards and black buoy No. 15 about 25 yards on the port hand and keep a black beacon No. 1 a very little on the port bow. When passing this beacon leave black buoy No. 17 about 25 yards on the port hand and steer **N. Westerly**; leave black buoy No. 19 about 25 yards on the port hand and continue on this course until the white beacon on the port bow is about ⅝ mile distant ahead; then haul a little westward so as to pass about 150 yards eastward of the beacon. When abreast of the beacon steer **N. ⅝ W.** so as to pass 30 yards westward of red buoy No. 12, and from this buoy steer about **NNE. ¼ E.** so as to pass about 100 yards eastward of the white beacon No. 5 on Orton Point. Then follow the directions in section 4.

Remarks.—The channel from Southport to Orton Point is narrow but well marked by buoys and beacons. The extent of the shoals bordering the channel renders it impracticable to give a description of them that would be of use to the navigator. The large number of old beacons and white tripods used in connection with the channel improvements may be somewhat confusing to a stranger; by closely following the buoys the beacons marking the present channel can not be easily mistaken.

4. ***From Orton Point to Wilmington.***—When 100 yards eastward of the beacon on Orton Point steer about **N.** by **E. ½ E.**; leave black buoy No. 21 about 25 yards on the port and red buoy No. 14 about 25 yards on the starboard hand and stand fair between red beacon No. 4 and black buoy No. 23. From this position steer **N. ½ W.** about 1⅝ miles, passing 25 yards westward of red buoys Nos. 16 and 16½. When abreast the latter buoy steer about **N. ½ E.**, heading a little eastward of a white beacon (No. 7); leave red buoy No. 16½ about 30 yards on the starboard hand and pass midway between red buoy No. 18 and black buoy No. 25. When between the latter buoys steer **NNW. ¾ W.**, heading eastward of black beacon No. 9 and between red buoy No. 20 and black buoy No. 27; when between these buoys steer **NW. ½ W.** and leave white beacon No. 11 about 50 yards on the port hand and red buoy No. 22 on the starboard hand. From beacon No. 11 steer **NNW. ¼ W.**; on this course a red beacon will be left about 300 yards on the starboard hand and red buoys Nos. 24 and 26 and red beacon No. 6 will be left about 35 yards on the starboard hand. From red buoy No. 26 steer **N.** by **E.**, heading for the red beacon (No. 10) on Hospital Point. Leave black buoy No. 29 about 25 yards on the port hand and then steer **N. ½ E.** and pass 100 yards westward of beacon No. 10. When abreast of this beacon steer **N.** by **W. ½ W.**; leave a wreck and red buoy No. 28 on the starboard hand and from this buoy steer **N. ¼ E.**, pass 25 yards eastward of black buoy No. 31 and 25 yards westward of red buoy No. 30, and from the latter buoy steer **N.** by **E. ⅝ E.**; leave red buoy No. 32 on the starboard hand and stand along the wharves on the starboard hand giving them a berth of 150 yards.

Remarks.—The channel is in most places narrow and bordered by shoals, but it is well marked by buoys and beacon post-lights (with day marks), which are fully described in the List of Beacons and Buoys of the Sixth Lighthouse District and pages 16, 17, of this volume.

No description of value to the mariner can be given of the shoals.

On the **N. ½ W.** course through the upper part of Liliput Channel the wharf on the eastern end of Campbell Island will be on the starboard bow, and the eastern part of **Campbell Island** (low and marshy) will be directly ahead.

The **N. ½ E.** course leads about 100 yards eastward of the wharf on Campbell Island.

LITTLE RIVER INLET*

is 27½ miles westward from Cape Fear Lighthouse; it is the approach from seaward to a small stream known as **Little River** and a number of small creeks which drain the marshes lying eastward and westward. Little River takes a northerly direction from the inlet for 1½ miles and then westerly for 5 miles. The post village of **Little River** is on the banks of the river. A branch making eastward is known as **Calabash Creek.**

*Shown on chart 151, scale $\frac{1}{80,000}$, price $0.50.

The channel into the inlet has a depth of about 5 feet at low water; it is crooked and changes from time to time. Small vessels of 5 feet draft when loaded, trade between the inlet and Wilmington, but it is seldom that a stranger enters, and a pilot is necessary for those who are unacquainted with the locality.

Sailing directions for entering that would be of use to a stranger can not be given.

WINYAH BAY *

is the first opening of any importance in the shore of South Carolina when coming from northward; it is a shallow body of water ranging in width from ¾ to 3¾ miles and extending about 10 miles in a general northwesterly direction. At its head, where it is known as **Georgetown Harbor**, the bay receives the waters of Waccamaw, Pedee, and Sampit Rivers, the two former from northward and the latter from westward. The entrance of the bay is obstructed by a shifting bar which extends about 2½ miles eastward and southeastward from the shore, and has a depth of about 11 feet in the buoyed channel. Inside the bar the depth in the channel up to the city of Georgetown is about 12 feet, but the bay is full of shoals and the channel is very narrow in some places.

The city of **Georgetown** is situated on the north shore of the Sampit River, just inside its mouth; it has considerable trade in lumber, naval stores, and cotton, but the shipping is limited (May, 1900) to vessels of not over 14 feet draft.

Waccamaw River drains **Lake Waccamaw**, which is 126 miles above its mouth; the river has a channel width of 80 feet and depth of 12 feet for a distance of 26½ miles, and a depth of 8 feet to the town of **Conway**; a channel width of 40 feet and depth of 3 feet can be taken 95 miles up the river. The most important landings are at **Bucksville**, 29 miles, and Conway, 42 miles above its mouth.

Pedee River, whose entrance is separated from Waccamaw River by a narrow point known as **Waccamaw Point**, is navigable a distance of 45 miles to **Smiths Mills** for vessels of 8 feet draft, and to **Cheraw**, 148 miles above its mouth, for steamers of 2½ feet draft. **Black River** empties into Pedee River from westward about 3½ miles above its mouth; the channel has a depth of 9 feet for a distance of 38 miles and 3 feet about 8 miles farther, but above this there is practically no navigable channel. **Little Pedee River** empties into the Pedee from northward about 30 miles above Winyah Bay. A draft of 3 to 4 feet can be taken about 63 miles up the Little Pedee River to its junction with the **Lumber River**, and about 3 feet draft 60 miles up the latter river to the town of **Lumberton**.

Sampit River is entered from Georgetown Harbor through a dredged channel 200 feet wide and 12 feet deep, which leads through the extensive shoals obstructing the mouth of the river. The depth in the river channel for a distance of 2½ miles above the dredged cut is 17 feet and this is the depth abreast the city of Georgetown. The principal landing above Georgetown is **Sampit**, about 10 miles above the mouth of the river.

The **Estherville-Minim Creek Canal**, having a width of 50 feet and depth of 7 feet at high water, connects the Santee River with Winyah Bay. The entrance to this canal is a little more than 6 miles below the city of Georgetown and about 3 miles above the quarantine station.

Prominent features.—Georgetown Lighthouse (see table, page 16) is on the eastern side of the entrance and the only conspicuous mark; it is easily recognized by a stranger entering the bay or standing along shore.

The **Bottle Channel** is about 1⅛ miles southward of the eastern point at the entrance to the bay; this channel is being improved by dredging and the construction of two jetties, and in May, 1900, had a depth of about 11 feet at low water; it is well buoyed. The principal channel up the bay is marked by buoys and is good for a depth of about 12 feet. There is another channel known as the **Western Channel** which has a depth of about 8 feet and leads along the western shore of the bay; but this channel is not marked and is only used by light-draft vessels and vessels bound through the Estherville-Minim Creek Canal.

Pilots on North Island keep a lookout for vessels and may be had by making the pilot signal while outside. Pilotage is compulsory for certain vessels (see pilotage laws, regulations, and rates in Appendix I). Strangers should not attempt to enter without a pilot.

Towboats are employed by sailing vessels and may be had from Georgetown by making the signal when outside the bar.

Anchorages.—The bottom in the entrance of the bay, westward of the lighthouse, is sand; a better anchorage is found in the channel about 1¾ miles above the lighthouse, where the holding ground is good. There is good anchorage in Georgetown Harbor off the mouth of Sampit River.

Quarantine.—The quarantine boarding station is on South Island on the western side of the bay about 1⅝ miles above Georgetown Lighthouse. (See also the Quarantine Laws of South Carolina in Appendix I, and National Quarantines in Appendix IV.)

*Shown on charts **152, 153**, scale $\frac{1}{80,000}$, price of each $0.50; **428**, scale $\frac{1}{40,000}$, price $0.25.

Hospital.—The nearest marine hospital is at Wilmington, N. C. At Georgetown there is a relief station (Class III) of the Marine-Hospital service. (See Appendix IV.)

Supplies.—Provisions, ship chandler's stores, and fresh water can be obtained at Georgetown.

Repairs.—The nearest place for repairs to vessels or machinery of steamers is at Charleston.

Storm-Warning Displays of the United States Weather Bureau are made at Georgetown.

Tides.—The mean rise and fall is 3½ feet; high water occurs at South Island 20 minutes after high water and low water 26 minutes after low water at Charleston. At Georgetown high water occurs 54 minutes and low water 1 hour 59 minutes later than at South Island.

Currents.—The tidal current in Winyah Bay varies in velocity with the state of the rivers emptying into it, as well as with the stage of the tide. Its velocity is greatest off South Island, where the average is from 2 to 2½ knots per hour, increasing somewhat with the springs. The velocity of the current on the bar is from ½ to 1½ knots, its set being about **NW.** and **SE.**, diagonally across the line of the south jetty. Between North and South islands the set of the current is toward Mud Bay until past the north point of the latter, when the set is more westward. Northward of Frazier Point the flood sets into the channel to the eastward of Hare Island, and also into the Waccamaw River. In the western channel the current sets fair with the course to be steered.

SAILING DIRECTIONS TO WINYAH BAY ENTRANCE.

Permanent sailing directions for entering can not be given on account of the frequent changes in the channel over the bar. The buoys are moved to indicate the best water whenever the channel shifts. Vessels have to lie off when there is a heavy sea on, as the bar can not then be crossed. The following directions will lead to the Sea buoy off the entrance between the jetties, where a pilot should be taken:

1. ***From the Eastward.***—While following the directions in section 2, page 38, when Frying Pan Shoal Light-vessel is made, steer so as to pass about 1 mile southward of it. When the light-vessel bears **N.** distant 1 mile, steer **WSW.** ⅜ **W.** This course made good for 68 miles should lead to a position from which Georgetown Lighthouse bears **WNW.** ¼ **W.** distant about 4 miles, and the Sea buoy should be ahead; here wait for a pilot.

At night follow the above directions, and when Georgetown Light is sighted use the lead and lie off and on, taking care not to shoal the water to less than 6 fathoms until after daylight, or until a pilot comes on board.

Remarks.—The shore from Cape Fear River entrance until nearly up to Georgetown Lighthouse can be approached as close as 1½ miles, carrying a depth of 3½ to 5½ fathoms. On the **WSW.** ⅜ **W.** course as Georgetown Lighthouse is brought on a **WNW.** ¼ **W.** bearing it should be about 5 miles distant, and a lookout should be kept for the Sea buoy, which should be made ahead; about 2 miles southwestward of this buoy is East Bank buoy; vessels should pass eastward of it. The Entrance bell buoy lies about ½ mile westward from the Sea buoy, and a vessel should lie-to eastward of the Sea buoy when waiting for a pilot.

Dangers.—**East Bank** has a least depth of 8 feet over it and lies 4½ miles from Georgetown Lighthouse, with the lighthouse bearing between **NW.** ¾ **N.** and **N.** by **W.** ¾ **W.**; the eastern side of the bank is marked by a buoy (can, red and black horizontal stripes). The Sea buoy (nun, white and black perpendicular stripes) is about 2 miles northward of East Bank buoy.

Extensive Shoals extend southward and southwestward from the entrance between the jetties; their outer edge is 2 to 3 miles from the shore.

About 6½ miles southward of the Sea buoy and Entrance bell buoy are several shoals with 17 feet of water over them.

1 A. ***From the Westward.***—Passing close to the southward of Charleston Light-vessel, steer **NE.** by **E.** ¼ **E.**; this course made good for 29½ miles will lead about ½ mile southward of Cape Romain Shoal buoy and bring Cape Romain Lighthouse to bear **NW.** by **W.** distant 6¼ miles. Then steer **NE.** for 12¼ miles. Georgetown Lighthouse should then bear about **NNW.** ¾ **W.**; then steer **N.** by **W.** for 5½ miles; the Sea buoy should then be about ½ mile distant on the port beam.

Remarks.—The **NE.** by **E.** ¼ **E.** course leads about 1 mile southward of Bull Breakers buoy and ¼ mile southward of Romain Shoal buoy. Bull Bay and Cape Romain lighthouses are left 5¾ miles distant when

abeam. After having stood on the **NE.** course for 12¼ miles, and when the course has been changed to **N.** by **W.**, Georgetown Lighthouse and the Sea buoy should be on the port bow, and East Bank buoy should be left about 1 mile on the port hand.

Dangers.—**Bull Breakers** make southward from the eastern end of Bull Island for a distance of 4¼ miles and are marked by a buoy (nun, red and black horizontal stripes).

Cape Romain Shoal extends nearly 4 miles southeastward from the pitch of Cape Romain and is marked by a buoy (can, red and black horizontal stripes and letters "C. R.") which lies 5½ miles **SE.** by **E.** from Cape Romain Lighthouse.

Shoals make off for a distance of about 3 miles from the shore between Cape Romain and Winyah Bay entrance, and there are spots with 17 feet of water over them lying 5¾ miles from the shore and 10½ miles **NE.** from Cape Romain Shoal buoy. The sailing line passes about ¾ mile southeastward of these spots. See also the dangers under section 1, preceding.

SANTEE RIVER.*

This is one of the largest rivers in the State of South Carolina and empties into the Atlantic just westward of Winyah Bay entrance. Of its many tributaries the most important are the **Congaree** and **Wateree** rivers, which empty into the Santee 120 miles above its mouth. There are two mouths to the Santee River, known respectively as the **North Santee** and **South Santee**, but there is only about 3 feet of water on the bars at the entrances to either of these mouths, and although marked by buoys, even in smooth water a pilot is necessary to carry this depth. In bad weather light-draft steamers can pass from the South Santee through Alligator Creek and by the inland passage, which is described in another part of this volume. The steamers running between Georgetown and landings on the Santee River pass through the Estherville-Minim Creek Canal.

The city of **Columbia** on the Congaree River, about 162 miles above the mouth of the Santee, and the town of **Camden**, about 177 miles above the mouth of the Santee, can both be reached by steamers of about 3 feet draft during a part of the year.

No directions that would be of use to a stranger can be given for either crossing the bars or the navigation of the rivers. Winyah Bay pilots will take vessels in over Santee River bar. A vessel desiring to enter should follow the directions for approaching Winyah Bay and take a pilot.

CAPE ROMAIN HARBOR.*

This is a small but good anchorage for light-draft vessels inside of **Cape Island** (**Cape Romain**) and about 14 miles southwestward of Georgetown Lighthouse. There are two entrances, one around the north end of Cape Island, with a depth of 4 feet at low water, and one from southward, leading to the westward of Cape Island, with about 5 feet of water. Romain Harbor communicates with the inland passage to the Santee River eastward, and to Bull Bay and Charleston westward. It is not safe for a stranger to attempt to make Cape Romain Harbor, as the shoals at both entrances are subject to changes.

The mean rise and fall of tides is 5 feet. High and low waters occur 24 minutes and 23 minutes, respectively, before high and low waters at Charleston. The tidal currents in the channels leading to Cape Romain Harbor have considerable velocity. Crossing the North Channel Bar they set about fair with the channel. Crossing South Channel Bar the set is across the channel, the ebb setting eastward and the flood westward; after crossing the bar the set is fair with the channel.

Cape Romain Harbor is only entered by those acquainted with the channels. A stranger seeking an anchorage should go to Bull Bay.

Sailing directions for Cape Romain Harbor that would be of use to a stranger can not be given.

BULL BAY†

is broad and shallow. The eastern point at its entrance is 6 miles westward of Cape Romain Lighthouse, and the western point, **Bull Island**, bears **SW.** by **W.** ¼ **W.** distant 11 miles from Cape Romain Lighthouse. The bay is full of shoals, between which there are a number of crooked channels. Its only importance is as a harbor of refuge for moderate-draft coasting vessels, and as an approach to the inland passage between Winyah Bay and Charleston. There is about 11 feet of water in the channel over the bar, and the anchorage is easy of access in southerly and easterly winds if the sea is not too heavy. **Bull Bay Lighthouse** is the principal guide for the channel over the bar and to the anchorage, which is off the north side of the point on which the lighthouse is situated. Shoals extend nearly 5 miles southward from the lighthouse and 3 miles southeastward from it, and all the way across the entrance of the bay.

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*Shown on charts **152, 153**, scale $\frac{1}{80,000}$, price of each $0.50.

†Shown on chart **153**, scale $\frac{1}{80,000}$, price $0.50.

Tides.—The mean rise and fall of tides is 4.7 feet. High and low waters occur about 20 minutes earlier than high and low waters at Charleston. The tidal currents generally set fair with the channel, but outside the Sea buoy the flood sets southward and the ebb northward and eastward.

SAILING DIRECTIONS, BULL BAY.

The following directions are good for a draft of 10 feet at low water and about 13 feet at high water with a smooth sea.

1. ***From the Eastward.***—Passing at least 6 miles southeastward and southward of Cape Romain Lighthouse, steer **WSW.** until Bull Bay Lighthouse bears **NW.** Steer for the lighthouse on this bearing, passing close to the Sea buoy (can, white and black perpendicular stripes), and when the lighthouse is about ¾ mile distant ahead haul northward, course about **NNW.**, until the lighthouse bears about **WSW.** and is distant about 500 yards; then follow the shore, giving it a berth of about 300 yards until well sheltered from the sea, and anchor in 3½ to 5 fathoms of water.

1 A. ***From the Westward.***—From Charleston Light-vessel steer **NE.** by **E.** about 14½ miles, passing south of Bull Breakers buoy. Then steer **NNE.** until Bull Bay Lighthouse bears **NW.**, and follow the directions in the preceding section.

CHARLESTON HARBOR*

is 260 miles southwestward of Cape Hatteras and about 65 miles northeastward of Savannah entrance. The harbor is the approach to the city of Charleston and to Cooper and Ashley rivers, and is also one of the approaches from seaward to the inland passage which extends northeastward to Winyah Bay and southwestward to the St. Johns River. The port has a large foreign and coastwise trade, the principal articles shipped being cotton, phosphate, lumber, naval stores, and rice. The harbor affords excellent anchorage for any vessel that can enter, but it is seldom used as a harbor of refuge by sailing vessels on account of the impossibility of entering by the narrow channel between the jetties except with a fair wind.

The entrance is obstructed by a dangerous bar, which extends nearly 3 miles to seaward, and is being improved by the Government. Two partly submerged jetties, one from the north side and the other from the south side of the entrance, extend out across the bar. Between these jetties the main channel, narrow, with a depth of 20 feet, leads into the harbor, and at high water with a smooth sea a draft of 24 feet can be taken through it and over the bar. Inside the entrance and northwestward of Fort Sumter is the lower anchorage in the harbor.

Cooper River enters Charleston Harbor from northward, and on the eastern side of the city of Charleston. There are no towns or villages of importance, the principal landings being at the phosphate works on its banks. The river is navigable for vessels of 5 feet draft to **Wadboo Bridge**; 7 feet can be taken to **Mulberry Bluff** and 15 feet to **Strawberry Ferry**, the latter being about 30 miles above Charleston. The channel is good up to Strawberry Ferry, but above this it is narrow and crooked. There are no aids to mark the channel.

Ashley River enters Charleston Harbor from northwestward and along the southern and western side of the city of Charleston. Vessels enter this river to load lumber and phosphate, the deeper draft vessels usually taking part of their cargo up river and finish loading below the new bridge, where the phosphate is brought to them in lighters. There are no villages on the river except the phosphate works and the houses of the employees. The principal landings, their distance above Charleston, and the draft that can be taken there, are: **Old Town**, 3 miles; **St. Andrews**, 10 miles, 15 feet; **Lambs**, 13 miles, 13 feet; **Middleton**, 12 feet; **Greggs**, 8 feet. **Dorchester** is at the head of navigation for light-draft river boats. Two bridges cross the river, the first at Spring street, in Charleston, known as the "New Bridge," which has a width of about 62 feet in the draw. At Bees Ferry, near St. Andrews, is the C. & S. railroad bridge, with a width of 78 feet in the draw. This bridge requires caution when passing up the river on the ebb current, which sets across the end of the draw. The north draw is the one mostly used by vessels.

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*Shown on charts 154, scale $\frac{1}{80,000}$, price $0.50; 451, scale $\frac{1}{20,000}$, price $0.50.

The city of **Charleston** is situated at the head of the harbor at the confluence of the Cooper and Ashley rivers, the eastern water front of the city extending along the west bank of the former and its southern and western water front along the north bank of the latter. The distance from the ends of the jetties to the city wharves is between 7 and 8 miles.

Prominent features.—Eastward of the entrance, on the Isle of Palms, is a large Ferris wheel, which shows prominently from seaward. On the southern side of the entrance is **Charleston Lighthouse** and about 2 miles southeastward from the entrance between the jetties **Charleston Light-vessel** (see table, page 18) is moored in 5 fathoms of water. On the eastern side of the entrance is the village of **Moultrieville**, and **Fort Sumter** is on the west side of the channel inside the entrance. The spires and houses of the city of Charleston will be seen from outside the bar when the entrance is fairly opened out. At night Charleston Light will be seen before the light-vessel is made by vessels approaching the entrance.

Channels.—There are two channels to cross the bar into Charleston Harbor. The **Main Channel**, which is being improved by the Government to a contemplated depth of 21 feet, leads between the jetties and now has a depth of 20 feet, which is maintained by dredging; it is well marked by buoys, and the range for entering by this channel is Fort Sumter Lighthouse in line with St. Philip's church spire; the latter also shows a fixed white light at night; Charleston Light-vessel is on the seaward end of this range. This is the channel now used by deep-draft vessels, but it is still quite narrow between the jetties.

The **Old Channel** extends from the deep water of the lower anchorage in a southerly direction, through a gap in the south jetty about ¾ mile from its shore end, to the crest of the bar southeastward of Charleston Lighthouse. The channel crosses the bar in a general southeasterly direction with a depth of about 12 feet. At present (September, 1900), there are no buoys as aids in this channel, and it should not be entered by a stranger.

Inside the harbor there are three channels from the lower anchorage up to the city: **Hog Island Channel**, leading along the eastern and northern shore; **Folly Island Channel**, leading between Shutes Folly Island and Fort Ripley Lighthouse; **South Channel**, which leads to the southward of Fort Ripley Lighthouse, and is the one used by deep-draft vessels.

Anchorages.—The lower anchorage has good holding ground, but it is somewhat exposed to southeasterly winds; this also applies to the anchorage off the eastern front of the city (see anchorage prescribed in the harbor regulations in Appendix I). The most severe winds from southeastward can not harm a vessel anchored in the Cooper River about 1 mile above the city. The quarantine anchorage is on the south side of the Main Channel abreast Fort Johnson, and is marked by two yellow buoys. The anchorage and the berthing of vessels is under the control and supervision of the Harbor master (see Appendix I).

Quarantine.—All vessels from infected or suspected ports will be directed to proceed to the Sapelo National Quarantine Station. Vessels subject to visitation by the health officer will be boarded when off the quarantine anchorage at Fort Johnson. (See also the quarantine regulations for the port in Appendix I, and National Quarantine in Appendix III).

Pilots will be found cruising outside the bar; the limit of their cruising ground is 30 miles from the entrance. Pilotage is compulsory for all foreign and nearly all coasting vessels (see pilot laws, regulations, and rates in Appendix I). Vessels desiring a pilot and not having obtained one, can anchor near the light-vessel until boarded by one.

Towboats will sometimes be found cruising outside the bar; the deeper draft sailing vessels tow in and out. All seagoing vessels bound into the Cooper and Ashley rivers employ towboats either outside the bar or at Charleston. Towboats can always be had by making signal while outside the bar, at the wharves, or may be ordered from the towboat offices in the city.

Wharves.—At most of the wharves deep-draft vessels lie aground in the soft mud at low water. The facilities for loading and discharging cargoes are good. The regulations in regard to fires on board vessels lying at the cotton wharves are very strict. (See also the harbor regulations in Appendix I.)

Supplies.—Coal, either anthracite or bituminous, in large quantities for steamers, can be had alongside the wharves or from lighters in the stream. Water can be had alongside the wharves or from water boats. Provisions and ship chandler's stores can be obtained in the city.

Repairs.—There is one marine railway 225 feet long and a capacity of about 1,200 tons, capable of hauling out a vessel of 13 feet draft. Repairs to the machinery of steamers and to the hulls of wooden or iron and steel vessels can be made at the shipyard.

Storm-Warning Displays of the **United States Weather Bureau** are made from the building on the corner of East Bay and Broad streets, and are visible to the shipping in the harbor. (See Appendix II.)

Naval Observatory time can be obtained, for chronometer comparison, at noon at the Western Union Telegraph office.

United States Marine-Hospital Service.—Medical attendance is furnished by a medical officer of the Service. Seamen requiring long-continued hospital treatment are sent to the marine hospital at Wilmington, N. C.; for short terms of hospital treatment they are sent to one of the hospitals in the city.

Tides.—For tidal data see table on page 10, also the tide tables of the Atlantic Coast of the United States, in which the tides for Charleston Harbor are predicted for every day of the current year. High water occurs on the bar about 15 minutes earlier than at the custom-house wharf.

Currents.—Off the bar the flood current sets 3 hours southwestward, then westward, and the last hour northwestward. The ebb for the first 3 hours sets northeastward, then eastward, and for the last hour southeastward. Inside the harbor the currents follow the general direction of the channels. At times during the ebb the current sets southward with considerable velocity across the south jetty. In the harbor the flood current continues from ½ hour to 1 hour after high water, and the ebb the same length of time after low water.

SAILING DIRECTIONS, CHARLESTON HARBOR.

The Main Channel has a depth of 20 feet and is more direct than the Old Channel; the latter in September, 1900, is used only by small local craft. With a working breeze between **NE.** through **E.** to **SW.** small sailing vessels can easily enter by the Main Channel if the sea is not too heavy on the bar and the buoys and ranges can be seen. This channel is recommended for all steamers. In easterly gales when the sea is breaking heavily on the bar vessels have frequently remained at anchor outside. It is not advisable for a sailing vessel to approach the harbor under such circumstances if she can make an offing, but if obliged to anchor outside there is a good prospect of riding out a gale in safety. A steamer can anchor and ride out almost any gale. The bottom is generally soft to the eastward and southeastward of the light-vessel, and the depths range from 5 to 6 fathoms.

In a northeaster anchor 1½ miles eastward of the light-vessel in 6½ fathoms. In a southeaster anchor about 3 miles southeastward of the light-vessel in 6½ fathoms, and in a southwester anchor about 1½ miles southwestward of the light-vessel in 5 to 5½ fathoms.

The following directions for entering by the Main Channel are good for a draft of 15 feet at low water. Strangers of deeper draft should never attempt to enter without a pilot. The Main Channel is liable to change and these directions can not be depended on to lead in the best water; the buoys should be followed closely.

1. ***Approaching from the Northward.***—If standing along the coast and following the directions in section 2, page 38, keep at least 5 miles offshore until Charleston Light-vessel is made; then, if desiring to enter by the Main Channel, steer for the light-vessel and when near it follow the directions in section 2.

In a rough sea in bad weather vessels of over 20 feet draft should give Cape Romain and the shore between it and Charleston entrance a berth of 10 miles.

Remarks.—Standing along the shore Cape Romain Lighthouse will probably be sighted and should be left at least 7 miles distant when abeam. In thick weather the shore between Cape Romain and Charleston entrance should not be approached closer than in 7 fathoms.

Dangers.—No shoals with less than 18 feet of water lie over 3¼ miles from the shore in the immediate vicinity of the entrance. A 27-foot spot lies 2¼ miles **E.** from the light-vessel.

Rattlesnake Shoal lies a little over 3 miles from the shore eastward of the entrance and has a least depth of 6 feet in several places. The shoal is about 2½ miles long in a general **E.** and **W.** direction and is marked by a red and black horizontally striped buoy at its eastern and one at its western end; the eastern buoy is a can and the western buoy a nun.

1 A. ***Approaching from the Southward.***—Passing ½ mile southeastward of Martins Industry Light-vessel, steer **NE. ¼ E.** This course made good for a distance of 54 miles from Martins Industry Light-vessel will lead to Charleston Light-vessel; from the latter follow the directions in section 2, for entering by the Main Channel.

Remarks.—On the **NE. ¼ E.** course the least depth encountered is 4½ fathoms, which will be found about 5 miles off the entrance to Stono Inlet. To carry a depth of 6 fathoms or over, a **NE. ¼ E.** course should be steered from Martins Industry Light-vessel until Charleston Lighthouse bears to the westward of **NNW. ½ W.**, then steer **N.** until Charleston Light-vessel is made, when the latter may be steered for.

2. ***Entering by the Main Channel and to the Lower Anchorage.***—From Charleston Light-vessel steer **NW.** by **W.** ¼ **W.**, heading directly for lighthouse on Fort Sumter and the tall white church spire which will be in range with it. Stand in on this range and leave the entrance buoy (bell, black) on the port hand; then follow the range, leaving the buoys on the hand indicated by their color and giving them a berth of about 35 yards. When past red nun buoy No. 8 steer about **NNW.** ⅜ **W.** on the Mount Pleasant Range (two white pyramidal structures, with lantern deck and gallery). Leave black buoy No. 11 and Cummings Point buoy (black, No. 13) about 150 yards on the port hand. When Fort Sumter bears abeam haul more westward, and when on the South Channel Range (near Fort Moultrie, front beacon red, rear beacon black) steer about **W.** ¼ **N.** keeping the range astern, and anchor when westward of the second yellow Quarantine buoy, or when Fort Ripley Lighthouse bears about **NE.**

If bound to the city, follow the directions in section 3.

Remarks.—When standing for the entrance to the Main Channel from the light-vessel the range of Fort Sumter Lighthouse and St. Philip's Church steeple will lead up to the entrance bell buoy. After passing the bell buoy close attention must be given to the range, and to the buoys, which are moved from time to time to indicate the best water. Attention must also be given to the currents, which are liable to set a vessel off her track while standing in between the jetties.

When standing on the Main Channel Range, after having passed black buoy No. 9, black buoy No. 11 will be ahead and black buoy No. 9½ on the port bow; the range should be held until black buoy No. 11 is about 250 yards distant ahead and the vessel is on the Mount Pleasant Range. When standing up for the anchorage **Shutes Folly Island,** low and marshy, with **Castle Pinckney** and a stake light (see table, page 18) at its southern end, and Fort Ripley Shoal Lighthouse will be on the starboard bow. The quarantine station is nearly 1¼ miles **W.** from Fort Sumter on the south side of the harbor.

3. ***From the Lower Anchorage to the City of Charleston.***—Having entered by the Main Channel, when on the Mount Pleasant Range and Fort Sumter is on the port beam, look out for the two beacons on Sullivans Island near Fort Moultrie; when these beacons come in range steer about **W.** ¼ **N.**, keeping the range over the stern until St. Philip's church spire bears **NW.** by **N.**; then steer for the church spire on this bearing and when about ¼ mile from the wharves, or, Fort Ripley Shoal Lighthouse opens southward of the southern point of Sullivans Island, steer **N.**

If desiring to anchor, be governed by the harbor regulations in Appendix I, which prescribe the anchorage limits off the city wharves.

Remarks.—The least width of the channel from the lower anchorage to the city is ¼ mile and the principal shoals on both sides are marked by buoys. The red and black horizontally striped nun buoy, which is left on the port hand when standing for St. Philip's church spire, marks the end of a long spit (known as **Battery Point Shoal**) which makes off from the southeastern point of the city. The channel into Ashley River leads southward of this buoy.

STONO INLET*

is the opening in the shore about 7 miles southwestward of Charleston Lighthouse. The entrance of the inlet is obstructed by a shifting sand bar which extends 2¼ miles seaward and usually has about 10 feet in the buoyed channel across it; the buoys marking this channel are moved to indicate the best water. Inside the bar the depth in the inlet ranges from 3 to 7 fathoms.

Stono River empties into the inlet from northward and about 1¾ miles above the entrance. On the west bank of the river, 3¼ miles above the entrance of the inlet, is the village of **Legareville.** The river is of little importance except for its phosphate rock, which is mostly shipped from Charleston. Its upper reach, above Wappoo Creek, forms part of the inland passage from Charleston to Savannah. There are no regular pilots for Stono Inlet, but Charleston pilots will take vessels in over the bar.

The mean rise and fall of tides is 5 feet. High water occurs at Legareville 5 minutes later and low water 15 minutes earlier than high and low waters at Charleston. The tidal currents at the Sea and Bar buoys set across the course, the flood southwestward and the ebb northeastward; but between Bird Key and North Breaker Shoals it sets fair with the channel.

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*Shown on chart 154, scale $\frac{1}{80,000}$, price $0.50.

GENERAL DIRECTIONS TO STONO INLET.

The following directions lead to the Sea buoy off the entrance; directions of a permanent character for crossing the bar can not be given. The buoys are the only guides.

I. *From the Northeastward.*—From a position ½ mile southward of Charleston Light-vessel steer **SW. ¾ W.**; this course made good for 11 miles should lead about 500 yards southward of the whistling buoy off Charleston entrance and about ½ mile southeastward of the Sea buoy off Stono Inlet.

II. *From the Southwestward.*—From Martins Industry Light-vessel make good a **NE. ⅛ E.** course for 43 miles; this should lead to the Sea buoy off the entrance to Stono Inlet.

Remarks.—Care should be taken when approaching the inlet to keep at least 3 miles offshore until the Sea buoy is made. The bottom at the anchorage in the inlet is hard sand, and the depth from 3½ to 5 fathoms.

NORTH EDISTO RIVER.*

The entrance to this river is 17 miles southwestward of Charleston Lighthouse and 16 miles northeastward of Hunting Island Lighthouse. The river has a depth of from 3 to 9 fathoms for a distance of 12 miles above its mouth, but is of little commercial importance; two of its tributaries, **Wadmelaw River** from eastward and **Dawho River** from westward, are part of the inland passage from Charleston to Savannah. Shoals extend offshore nearly 3 miles at the entrance of the river, forming a shifting bar over which there is a channel depth of about 10 feet. This channel is marked by buoys which are moved, when practicable, to indicate the best water. Strangers seldom enter the river; there are no aids except the buoys.

The mean rise and fall of tides is 5.8 feet. High water occurs 11 minutes before and low water about 26 minutes before high and low waters, respectively, at Charleston. On the bar the direction of the current is generally across the channel; the flood current sets about **SW.** by **W.** and the ebb **ENE.**, and both have considerable velocity. Inside the bar, in the channel between the breakers, the ebb current is to be guarded against, particularly as it sets across the North Breakers.

GENERAL DIRECTIONS TO NORTH EDISTO RIVER.

The following directions lead to the Sea buoy off the entrance. Directions of a permanent character for crossing the bar can not be given.

I. *From the Northeastward.*—With Charleston Lighthouse bearing **NNW. ½ W.** distant 4 miles, steer **SW.** by **W. ½ W.**; this course made good for 15½ miles will lead about ⅜ mile southward of Stono Inlet Sea buoy and ¾ mile **SSE.** from North Edisto River Sea buoy.

II. *From the Southwestward.*—From Martins Industry Light-vessel make good a **NE. ⅜ N.** course for 33¼ miles; this should lead to a position about 1 mile **S.** of the Sea buoy off the entrance to the river.

Remarks.—On the **NE. ⅜ N.** course Hunting Island Lighthouse should be at least 7 miles distant when it bears abeam; this will clear the shoals off the entrance to St. Helena Sound. A pilot for the bar may sometimes be found off the entrance to St. Helena Sound.

SOUTH EDISTO RIVER†

empties into the Atlantic about 8 miles northeastward of Hunting Island Lighthouse and just eastward of St. Helena Sound entrance. The river is of little commercial importance, but it is navigable for flatboats and rafts for a distance of about 220 miles above its mouth. For the first 11 miles above its mouth it is known as the **South Edisto**, and for a distance of about 5 miles, from Mosquito Creek to Dawho River, it is sometimes known as **Ponpon River**; above the Dawho River it is known as the **Edisto River**. The stretch of the river between Mosquito Creek and Dawho River forms part of the inland passage from Charleston to Savannah, and as the water here is usually fresh, steamers passing through the inland passage fill their boilers and tanks from the river. **Jacksonboro** is a village about 33 miles above the mouth of the river.

The entrance of the river is obstructed by a shifting bar which, properly speaking, is part of the extensive shoal which makes offshore for a distance of about 5 miles from the entrance to St. Helena Sound. The depth

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*Shown on charts **154**, scale $\frac{1}{80,000}$, price $0.50; **434**, scale $\frac{1}{50,000}$, price, $0.20.

†Shown on charts **154**, scale $\frac{1}{80,000}$, price $0.50; and entrance **436**, scale $\frac{1}{40,000}$, price $0.25.

through the buoyed channel into South Edisto River is from 9 to 11 feet, and the buoys are moved to indicate the best water whenever the channel changes.

Tides.—The mean rise and fall of tides is 6 feet. High water occurs at the time of high water at Savannah entrance, and low water 9 minutes before low water at Savannah entrance.

For sailing directions to the entrance see the sailing directions for St. Helena Sound. The South Breaker buoy lies about 3½ miles **N. ¼ E.** from the Sea buoy at the entrance to the Main Channel into St. Helena Sound. If desiring to enter the river a stranger should take a pilot. Pilots for the bar can sometimes be found off the entrance of the sound, or they may be obtained from Savannah, Charleston, or Port Royal.

ST. HELENA SOUND *

is the broadest opening in the coast of the United States between Chesapeake entrance and the Gulf of Mexico; from **Bay Point** on the east, which is also the eastern point at the entrance to the South Edisto River, to **Hunting Island** on the west the entrance is 6½ miles wide. About 1¾ miles from the northern end of Hunting Island is **Hunting Island Lighthouse** (see table, page 20), the principal guide to the entrance. Shoals make off for a distance of 6 miles seaward from the entrance, through which there are several channels leading into the sound. The principal channel, known as the **Main Channel**, has a depth of about 16 feet and is marked by buoys which are moved to indicate the best water whenever the channel shifts. Vessels of 21 feet draft occasionally enter the sound to load phosphate at the mouth of Bull River. The East (Slue) Channel has a depth of 8 feet.

A number of navigable rivers empty into the sound, the most important of which are the Coosaw, Ashepoo, Bull, Combahee, Morgan, and Harbor rivers. Some of these rivers and their tributaries form a part of the inland passage from Charleston to Savannah, connecting eastward with the South Edisto River and westward with Port Royal Sound. See description of inland passage south of Winyah Bay.

Coosaw River empties into the head of the sound about 5 miles above its entrance. The river is of some importance on account of its phosphate rock which is dredged from the river bed, prepared for shipment, and loaded into vessels; it also forms part of the inland passage from Charleston to Savannah. About 6 miles above its mouth **Brickyard Creek** from southward connects with Beaufort River and about 12 miles above the mouth of Coosaw River the **Whale Branch** connects it with **Broad River**; the latter is a tributary of Port Royal Sound. The channel in the river is marked by buoys for a distance of about 12 miles above its mouth, and a depth of 15 feet can be taken up to the mouth of Brickyard Creek at high water.

Bull River empties into Coosaw River from northward about 5 miles above its mouth; the river is narrow and crooked and for a distance of 3 miles the channel is good for a draft of 18 feet.

Combahee River empties into the Coosaw River from northward about 2 miles above its mouth. The river mouth can be entered by vessels of any draft that can cross the bar, but only 10 feet can be taken farther than 2 miles up on account of the numerous shoals.

Ashepoo River empties into St. Helena Sound from northward just inside the entrance. The river is important as forming part of the inland passage from Charleston to Savannah, and a draft of 12 feet can be taken up about 5 miles above its mouth.

Morgan River empties into St. Helena Sound from westward. The river is about 9 miles long to its head, where it connects with **Chowan Creek**, a tributary of Beaufort River, but the passage thus formed is of little importance. The best way to enter Morgan River from the main channel of St. Helena Sound is through **Parrotts Creek**, which has 13 to 14 feet of water and leads from the Coosaw River nearly opposite the mouth of Bull River. For a distance of 7 miles above its mouth the depth in the channel of Morgan River is not less than 17 feet.

Harbor River empties into St. Helena Sound from southwestward. At its head the river connects with **Story River** and the latter with **Station Creek**, forming an inland water way from St. Helena Sound to Port Royal Sound; but this passage is rarely used.

Pilots will sometimes be found cruising outside the bar between Port Royal Sound and North Edisto River. Charleston pilots will sometimes take vessels into the sound. Pilotage is compulsory for certain vessels (see Appendix I).

Towboats.—There are no towboats except those belonging to the phosphate works. If expecting a vessel, a towboat will sometimes be on the lookout at the entrance to tow her in.

Tides.—The mean rise and fall of tides on the bar and entrance to St. Helena Sound is 6 feet. High water occurs 3 minutes later and low water 11 minutes earlier, respectively, than high and low water at Savannah entrance.

* Shown on charts **154**, scale $\frac{1}{80,000}$, price $0.50; **436**, scale $\frac{1}{40,000}$, price $0.25.

SAILING DIRECTIONS, ST. HELENA SOUND.

The directions in section 2 are good for a draft of 13 feet at low water and 18 feet at high water in the daytime with a smooth sea. To take in a greater draft the services of a pilot are necessary.

The channel is subject to some change and the buoys are moved to indicate the best water; they should therefore be closely followed.

1. ***Approaching from the Northeastward.***—With Charleston Light-vessel bearing **NW.** distant ¾ mile, steer **SW. ¾ W.**; this course made good for 32½ miles will lead to a position ¾ mile southeastward of the Sea buoy at the entrance to the Main Channel.

Or, if Hunting Island Lighthouse is sighted and is distant over 7½ miles, bring the lighthouse to bear **W. ¼ S.** and steer for it on this bearing until up to the Sea buoy. Then follow the directions in section 2.

Remarks.—The **SW. ¾ W.** course leads about ½ mile southward of the whistling buoy off Charleston entrance and nearly 1 mile southward of Stono Inlet Sea buoy; after passing the latter buoy the sailing line draws offshore gradually and when nearly up to the Main Channel entrance the shore northward will be 7 miles distant. On a hazy day Hunting Island Lighthouse will not be seen until close up to the bar, and if the Sea buoy is not made the entrance should not be approached closer than in 5 fathoms of water. Care must be taken not to mistake the Sea buoy of the Main Channel for the Entrance buoy of the East Channel; they are both perpendicularly striped can buoys, but the Main Channel Sea buoy is the larger and has the letters "St. H." painted on it.

Dangers.—**The shoals** making off from the shore and at the mouths of the rivers between Charleston entrance and the entrance to South Edisto River extend seaward for a distance of 3 miles.

The shoals at the entrance to St. Helena Sound make off southeastward and eastward from Hunting Island for a distance of 5½ miles and depths of 4 to 9 feet will be found very near the outer edge of these shoals in several places.

1 A. ***Approaching from the Southwestward.***—Passing about ½ mile southeastward of Martins Industry Light-vessel, steer **NE. ¼ N.** for 19 miles, then steer **N.** until up to the Sea buoy and follow the directions in section 2.

Remarks.—On the **NE. ¼ N.** course the soundings should give depths of more than 6 fathoms. See the remarks and dangers under section 1, preceding.

2. ***From the Sea Buoy to anchorage off Bull River.***—The courses up to Pelican Bank bell buoy are only approximate, and to somewhat assist in picking up the buoys. Passing close on either side of the Sea buoy steer for the Bar buoy (can, white and black perpendicular stripes), course about **WSW.** Pass close to the Bar buoy and steer for North Breaker bell buoy, course about **WNW.**; leave this buoy on the starboard hand and Turn buoy (can, black, No. 1) about 40 yards on the port hand. Then steer about **NNE.** for Starboard Shoal buoy (nun, red, No. 2), leaving it on the starboard hand, and then for Lump buoy (can, black, No. 3), which should be left on the port hand. From the latter buoy steer for Mid-channel buoy (nun, white and black perpendicular stripes) course about **NNW. ½ W.**; leave this buoy on either hand and steer so as to leave Junction buoy (nun, white and black perpendicular stripes) about 100 yards on the starboard hand and Pelican Bank buoy (can, black, No. 3½) about 200 yards on the port hand.

From Pelican Bank buoy steer **NW.** by **W. ¼ W.**; on this course Combahee Spit buoy (nun, red and black horizontal stripes) should be left well on the starboard hand, and the ruins of the old lighthouse (standing in the water) should be left 600 yards on the starboard hand; Combahee Bank buoy (nun, red, No. 4) should be left about 150 yards on the starboard hand. The course may have to be changed a little more northward after passing Combahee Bank buoy so as to leave Marsh Island Spit buoy (can, black, No. 5) on the port hand. When abreast of Marsh Island Spit buoy, steer **NW.** by **W. ½ W.** nearly 1½ miles; Bull River will then be opened on the port bow and Bull Spit buoy (nun, red and black horizontal stripes) should be seen to the left of the entrance. Steer about **W.** with

the buoy a little on the port bow and anchor in 4 to 6 fathoms of water when about 1 mile from it.

Remarks.—Shoals extend along the channel on both sides and a detailed description of them would be useless. On the **NW.** by **W.** ½ **W.** course Pelican Bank, which shows bare at low water for a distance of about 4 miles, is left on the port hand. On the **NW.** by **W.** ½ **W.** course from Marsh Island Spit buoy, the entrance to Combahee River is broad on the starboard bow, and Marsh Island should be left about 500 yards on the port hand. A few iron piles still stand and mark the site of the old lighthouse.

PORT ROYAL SOUND *

is one of the largest and best harbors on the coast of South Carolina and has a better natural depth over the bar than any harbor between Chesapeake Bay and Key West; between **Bay Point** on the northeast, and **Hilton Head** on the southwest, the entrance is about 2 miles wide. Shoals extend 8 miles in a general **SSE.** direction from the entrance, forming a bar at the outer part through which two buoyed channels lead to the deep water inside. The easternmost of these channels, known as the **Southeast Channel,** is marked by **Hilton Head Range** (lighted beacons) and has a depth of 19 feet. The other channel is known as the **South Channel** and has a depth of about 16 feet. **Martins Industry Light-vessel** is moored outside of and about midway between the sea buoys marking the entrances to these channels. A draft of 25 feet can be taken over the bar at high water and with a smooth sea, but it requires local knowledge; strangers of over 16 feet draft should not attempt to enter without a pilot.

The principal tributaries of Port Royal Sound are the Beaufort, Broad, and Chechessee rivers; of these Beaufort River is the only one of commercial importance; it is also part of the inland passage from Charleston to Savannah.

Beaufort River empties into the sound from northward and just inside Bay Point. The river is important as the approach to the city of Beaufort and town of Port Royal, and to the **United States Naval Station,** which is situated on the west bank about 5¾ miles above Bay Point. The city of **Beaufort** is about 11 miles above the mouth of the river; it has a little trade and can be reached by vessels of 18 feet draft; there is 16 feet of water alongside the wharves. **Port Royal** is on the north bank of the mouth of **Battery Creek,** which empties into Beaufort River from westward 6¾ miles above Bay Point. The town is the terminus of a railroad, but at present (1900) has no trade. A draft of 25 feet can be taken to Port Royal at high water. There is 20 feet of water at one of the wharves at low water. The two large phosphate works on the west bank of Beaufort River, between Port Royal and Beaufort, ship considerable phosphate both by rail and in foreign vessels; a draft of 22 feet has been taken from the works and over the bar. **Archers Creek** is a narrow passage leading westward from the mouth of Battery Creek into Broad River; about 8 feet can be taken through at high water. **Chowan Creek** (known locally as Johnsons River) empties into Beaufort River from eastward 5¼ miles above Bay Point; this creek connects with Morgan River and forms an inland passage at high water for light-draft boats to St. Helena Sound.

Broad River empties into the head of Port Royal Sound from northwestward, and appears as an extension of the sound in that direction. It has a length of about 23 miles, and is navigable for vessels of 12 feet draft to **Mackeys Point**; a draft of 17 feet can be taken up 11 miles to **Whale Branch,** which connects Broad River with the Coosaw River. The **Coosawhatchie River,** the most important tributary of Broad River, is navigable only for light-draft steamers. Broad River is of no commercial importance, and no stranger should attempt its navigation without a pilot.

Chechessee River empties into the head of Port Royal Sound from westward; **Colleton River,** one of its tributaries, is of little importance, but has a good channel for a distance of 5 miles. A depth of 24 feet can be taken up the Chechessee to the mouth of the Colleton River, and 20 feet up the latter for a distance of 5 miles. These rivers are of no commercial importance, and should not be entered without a pilot.

Skull Creek enters Port Royal Sound from southwestward about 4 miles above Hilton Head. The creek forms part of the inland passage to Savannah; it is full of low marsh islands, many of which are under water at high water, and has a very narrow and crooked channel with a depth of about 12 feet.

Prominent features.—Martins Industry Light-vessel is the only aid that can be depended on to be made when approaching the bar. The **Hilton Head Range beacons** (see table, page 20) are 10 miles distant from the Sea buoy at the entrance of the Southeast Channel, and will not be seen in the daytime. There are no natural features that can be distinguished by a stranger until after the bar has been crossed. The **Paris Island Range beacons** (see table, page 20) lead up the channel from inside the bar to the mouth of Beaufort River; after crossing the bar this range will be over 10 miles distant, and in the daytime will not be distinguished until well up to the entrance.

* Shown on charts 155, scale $\frac{1}{80,000}$, price $0.50; 438, scale $\frac{1}{40,000}$, price $0.25.

Anchorages.—The usual and best anchorage is in the mouth of Beaufort River, with Bay Point bearing southward of **E.**; southward of Bay Point the holding ground is poor. There is good anchorage, with a depth of about 4 fathoms, in the channel of Beaufort River from a short distance below the Quarantine Station to a short distance above the Naval Station. Vessels should be careful not to anchor on the Paris Island Range. The sound is sometimes used as a harbor of refuge in winter.

Quarantine.—The local quarantine station is on the west bank of Beaufort River 5 miles above Bay Point; above this no vessel, subject to inspection by the health officer, is allowed to pass before obtaining pratique. (See the quarantine laws and regulations in Appendix I, and National Quarantines in Appendix IV.)

Pilots.—Licensed pilots usually cruise off the bar and will sometimes be found as far northward as Frying Pan Shoals Light-vessel. If a pilot is not obtained outside, the vessel may come to anchor off the Sea buoy with the pilot signal set until she is boarded by one. Pilotage is compulsory for all vessels trading out of the State. (See pilot laws in Appendix I.)

Towboats.—Sailing vessels seldom employ towboats either over the bar or in Beaufort River. Towboats can be had at the offices of the phosphate works if needed.

Supplies.—Coal in small quantities can be had at Beaufort. Water can be had alongside the wharves at Port Royal and Beaufort. Provisions and ship chandler's stores can be obtained in Beaufort and Port Royal.

Repairs.—The nearest place where a vessel can be hauled out is Savannah. The Government dry dock at the Naval Station is 448 feet long on the blocks, from 96 to 66 feet wide, and has 26 feet of water on the sill.

Hospital.—At Beaufort there is a relief station (Class IV) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Storm-Warning Displays of the **United States Weather Bureau** are made on a building at Port Royal.

Tides.—For tidal data see table on page 10. High water occurs at Hilton Head 2 minutes after high water and low water 1 minute after low water at Savannah entrance. It is high and low water at Port Royal 47 minutes later than at Hilton Head, and high water and low water at Beaufort about 1 hour later than at Hilton Head.

Currents.—No reliable information in regard to the currents on the bar can be given; they are influenced greatly by the winds.

SAILING DIRECTIONS, PORT ROYAL SOUND.

The directions in sections 1 and 1 A are good for vessels of any draft until up to the Sea buoy; but no vessel of over 16 feet draft should attempt to enter by section 2, or over 12 feet draft by section 2 A, without a pilot. No stranger should attempt to enter at night.

1. ***Approaching from the Northeastward.***—Coming from Frying Pan Shoals Light-vessel follow the directions in section 2, page 38. When Martins Industry Light-vessel is made, steer for it and then:

If desiring to enter by the Southeast Channel, when the light-vessel is about 5 miles distant bring it to bear **SW.** and steer for it on this bearing until it is 2¼ miles distant; the Sea buoy (can, white and black perpendicular stripes, "P. R." in white letters) at the entrance to the Southeast Channel will then be about 1 mile distant on the starboard beam. Haul up for this buoy and if of less than 16 feet draft follow the directions in section 2. If in a vessel of deeper draft, take a pilot.

If desiring to enter by the South Channel, pass close to Martins Industry Light-vessel and steer **WSW. ½ W.** about 2¾ miles; the Sea buoy (nun, white and black perpendicular stripes, "P. R." in white letters) at the entrance to the South Channel should then be close aboard. From this buoy, if of less than 12 feet draft, follow the directions in section 2 A, or, take a pilot.

Remarks.—The shoals forming the bar lie 8 miles off the entrance and no landmarks can be recognized by a stranger at this distance. Martins Industry Light-vessel is the only reliable guide for approaching from any direction. Vessels coming close alongshore should give Hunting Island Lighthouse a berth of at least 6 miles when it bears **NW.**

1 A. ***Approaching from the Southwestward.***—A good rule to follow is to keep 7 miles from the shore, and when Tybee Lighthouse bears **NW.** it should be at least 6 miles distant; from here a **NE. ½ E.** course should be steered, and when Martins Industry Light-vessel is made, steer for it and then:

If desiring to enter by the South Channel, bring the light-vessel to bear **NE.** by **E.** and steer for it, and when it is 2¾ miles distant the Sea buoy (nun, white and black perpendicular

stripes, "P. R." in white letters) at the entrance to the South Channel, should be about ¾ mile distant on the port beam; head up for this buoy and if of less than 12 feet draft, follow the directions in section 2 A, or, take a pilot.

If desiring to enter by the Southeast Channel, pass close to the light-vessel and steer **N.** by **E.** ½ **E.** about 2½ miles; the Sea buoy (can, white and black perpendicular stripes, "P. R." in white letters) at the entrance to Southeast Channel should then be close aboard. From this buoy, if of less than 16 feet draft, follow the directions in section 2, or, take a pilot.

See also the remarks under section 1 preceding.

2. ***Entering by the Southeast Channel.***—From the Sea buoy steer about **W.** by **N.** with the Hilton Head Range beacons ahead (they may be seen on a very clear day through good glasses); leave Mid-channel buoy close-to on either hand and Turning Point buoy (bell) on the starboard hand, and when it is abeam steer **NNW.** ⅜ **W.** On this course Paris Island Range beacons should be ahead (they may be seen with good glasses on a very clear day) and two Main Channel buoys should be left close-to on either hand when they are passed. After the Upper Main Channel buoy is passed the Paris Island Range beacons should be in plain sight and the range should be closely kept until past Bay Point. When Middle Shoal buoy (nun, red and black horizontal stripes) is abaft the port beam, haul off on either side of the range and anchor in 4¾ to 5¾ fathoms of water.

Remarks.—If the ranges can not be distinguished, close attention must be paid the buoys, care being taken not to be set off the sailing line by the tidal currents. When on the **NNW.** ⅜ **W.** course and after the Upper Main Channel buoy has been passed, three black buoys will be left on the port hand; the second one (can, No. 3) is left about 200 yards distant, the other two are left ⅜ mile and nearly ⅝ mile distant.

Middle Shoal buoy bears about **W.** from Bay Point and a vessel should anchor when this buoy bears about **SW.**

A detailed description of the shoals at the entrance would be useless as they are of a shifting nature; the buoys are moved to indicate the channels. Vessels entering must keep close on the sailing lines.

2 A. ***Entering by the South Channel.***—Passing close to the Sea buoy, steer about **NNW.** with Martins Industry (southwest end) buoy (nun, red, No. 2) a little on the starboard bow; leave this buoy 100 yards on the starboard hand and steer about **N.** by **E.** ¼ **E.** heading for Mid-channel buoy (can, white and black perpendicular stripes); passing this buoy close-to on either hand continue the course leaving Martins Industry Shoal (northwest end) buoy (nun, red, No. 4) about 150 yards on the starboard hand and standing for Main Channel buoy (can, white and black perpendicular stripes). Leave this buoy close-to on either hand and steer **NNW.** ⅜ **W.**; on this course Paris Island Range beacons should be ahead and Middle Main Channel buoy and Upper Main Channel buoy (cans, white and black perpendicular stripes) should be left close-to on either hand. Continue on the Paris Island Range and anchor as directed in section 2 preceding.

See, also, the remarks under section 2 preceding.

CALIBOGUE SOUND.*

The entrance to this sound lies 11 miles southwestward of Port Royal Sound entrance and 5 miles **N.** from Tybee Lighthouse; it is obstructed by shifting shoals through which there are several unmarked crooked channels. The usual way of entering the sound is from Tybee Roads and the depth that can be taken over the bar at low water is about 8 feet. The least depth in the channel, above the entrance and for a distance of 6½ miles to Skull Creek, is about 4 fathoms.

May River, which empties into the sound from westward about 5½ miles above the entrance, is the approach to the town of **Bluffton**, situated about 7 miles above its mouth. A draft of 8 feet at low water and 14 feet at high water can be taken to the town by entering May River through Tybee Roads and Calibogue Sound, and 12 feet at low water and 18 feet at high water by entering the river by way of Port Royal Sound and Skull Creek.

* Shown on chart 155, scale $\frac{1}{80,000}$, price $0.50.

Cooper River empties into the sound from westward about 2¼ miles above the entrance; this river is only important as a part of the inland passages to Savannah.

Mackays Creek enters the sound from northward at its junction with May River. About 1¼ miles above the mouth of the creek it is entered from northeastward by Skull Creek, which connects with Port Royal Sound and forms part of the inland passage.

On the south side of the entrance to Cooper River are two lighted beacons which form the Daufuskie Island Range (see table, page 20) for entering the sound from Tybee Roads. There should be no difficulty for a stranger to enter the sound, but if bound to Bluffton or into any of the tributaries a pilot should be employed.

See heading "Tybee Roads and Savannah River" for information in regard to tides and currents.

GENERAL DIRECTIONS, CALIBOGUE SOUND.

Entering Calibogue Sound through Tybee Roads a draft of about 8 feet can be taken at low water. Entering the sound from Port Royal through Skull Creek a draft of 12 feet can be taken at low water. To enter from Tybee Roads first follow the sailing directions for approaching and entering Savannah River.

From Tybee Roads to an anchorage in Calibogue Sound.—When in Tybee Roads and near Inner buoy (can, white and black perpendicular stripes), steer **NW.** ½ **N.** on the Bloody Point Range and keep a sharp lookout for the range on the western side of the entrance to the sound and for the two nun buoys on the bar which should be made on the starboard bow. When the vessel is nearly up to the nun buoys steer about **N.** by **E.** and leave Wreck buoy (nun, red and black horizontal stripes) and Bar buoy (nun, red) on the starboard hand and stand on the range over the bar and into the entrance of the sound. When Braddock Point, the low point on the east side of the entrance, is abaft the beam, follow a mid-sound course until the front range beacon bears **NW.** and anchor in 6 to 9 fathoms water, soft bottom.

Remarks.—The **Daufuskie Island Range** is described in the table on page 20. For entering the sound through Skull Creek a pilot should be employed in Port Royal Sound. A general description of the creek is given under the heading "Inland Passage South of Winyah Bay."

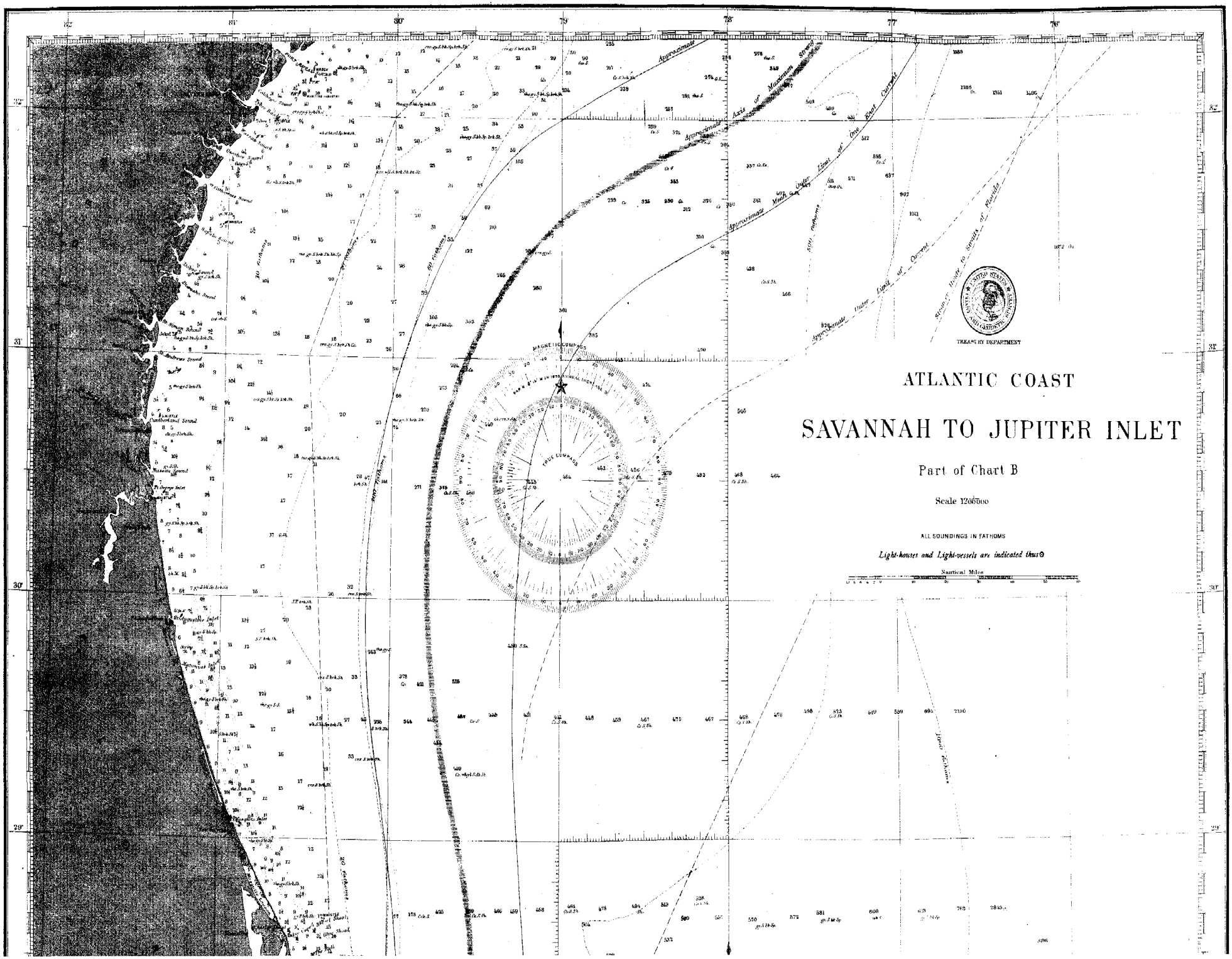
TYBEE ROADS AND SAVANNAH RIVER.*

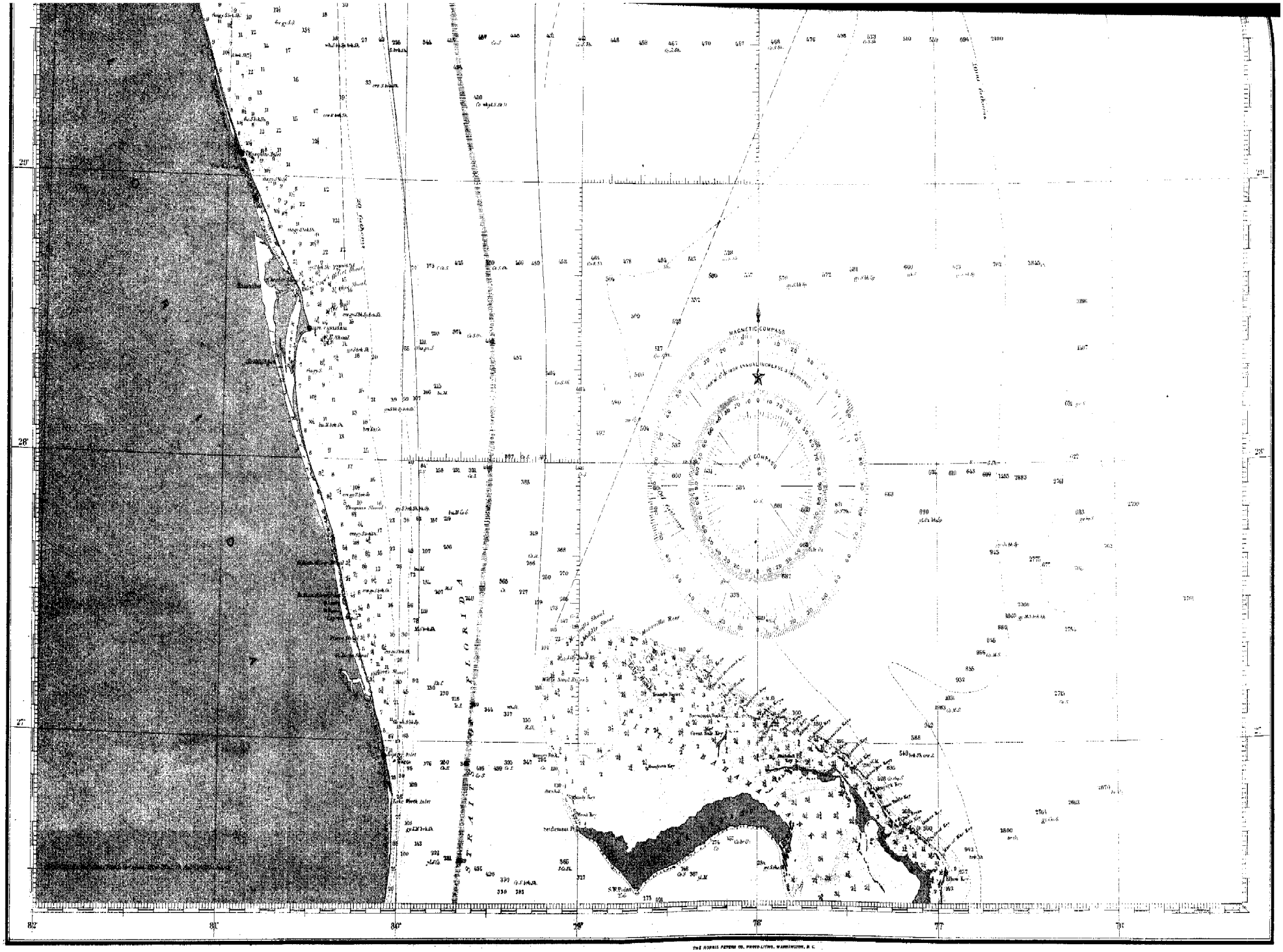
Tybee Roads is the name applied to an anchorage surrounded by the shoals which lie off the entrance to Calibogue Sound and Savannah River, eastward of the northeastern end of Tybee Island. This anchorage is important as a harbor of refuge in the fall and winter and can be entered either in the daytime or at night; its general depth is 19 to 23 feet and the shoals assist to break the sea from any direction. There are two good channels leading across the bar off the roads, the North Slue Channel with 14 feet of water and the Main Channel with 18 feet of water; both of these channels are marked by buoys and the Main Channel by a number of ranges which are easily followed. The entrance to Calibogue Sound lies directly north from the anchorage in Tybee Roads and the entrance of Savannah River west.

Savannah River forms the boundary between the States of South Carolina and Georgia, and is navigable during the greater part of the year for steamers of 4 to 5 feet draft to the **City of Augusta**, a distance of about 188 miles above its mouth; flatboats can be taken up the river about 14 miles farther. Between the cities of Savannah and Augusta there are numerous landings, but no towns or villages of importance; several bridges, with draws about 60 feet wide, cross the river below Augusta. From its entrance to the city of Savannah the river is being improved by the Government. The channel is narrow and crooked with wing dams and jetties on both sides; at present (1900) it has a least depth of 18½ feet at low water from Tybee Roads to the city; it is marked by a number of buoys and range beacons, but strangers of over 12 feet draft should always employ a pilot when entering the river. About 4½ miles below the city of Savannah and emptying into the river from a southerly direction is St. Augustine Creek, which connects with Wilmington River and forms a part of the inland passage to Fernandina, Florida.

The **City of Savannah** is on the south bank of the river about 15 miles above the entrance; it is the chief port of the State of Georgia and one of the important southern ports for the shipment of cotton, lumber, and naval stores. In 1900 vessels of 24 feet draft can be taken to Savannah at high water and vessels load at the city to this draft; there is sufficient water at the wharves for any vessel that can be brought to the city.

*Shown on charts **155**, scale $\frac{1}{80,000}$, price $0.50; **440**, scale $\frac{1}{40,000}$, price $0.50.


ATLANTIC COAST
SAVANNAH TO JUPITER INLET
Part of Chart B
Scale 1/200000
ALL SOUNDINGS IN FATHOMS
Light-houses and Light-vessels are indicated thus
Nautical Miles
TREASURY DEPARTMENT
MAGNETIC COMPASS
TRUE COMPASS
Approximate Axis of Maximum Gulf Stream Current
Approximate Mean Outer Limit of the Gulf Stream Current
Approximate Outer Limit of Current
Strong Tide to South of Florida
Hillsboro Inlet
Boca Raton Inlet
Lake Worth Inlet
Jupiter Inlet



THE HOBBS PETERS CO. PHOTO-LITHO. WASHINGTON, D. C.

Prominent Features.—**Tybee Lighthouse,** on the south side of the entrance to Savannah River, is the most prominent object and is easily recognized by vessels approaching the bar from seaward. Vessels approaching from eastward usually make Martins Industry Light-vessel before sighting Tybee Lighthouse. When in Tybee Roads and standing into the river, **Fort Pulaski** and **Cockspur Island Lighthouse** will be seen to the westward and a number of beacons (lighted at night) will be seen on both sides of the channel.

Ranges.—The range for entering by the Main Channel is formed by Tybee Lighthouse and **Tybee Beacon Light,** the latter a white skeleton structure bearing **ESE.** from the lighthouse and showing a fixed red light at night. **Bloody Point Range** is formed by a square, pyramidal, skeleton structure painted white, and a white and red triangular skeleton frame, both situated on the southeastern end of **Daufuskie Island,** and from 4¼ to 4¾ miles **N.** by **W.** ½ **W.** from Tybee Lighthouse. This range leads from North Breaker bell buoy to the anchorage in Tybee Roads. There are several ranges for leading in the channel between the jetties at the entrance to the river.

Anchorages.—The usual anchorage for vessels waiting for a favorable tide to go up the river is in **Tybee Roads,** 1½ miles eastward of Tybee Lighthouse. There is a small anchorage, with a depth of 18 feet, close to the beach northward of Tybee Lighthouse; this is the better anchorage in southerly winds. The holding ground is good at both anchorages, but vessels of 22 feet draft or over will lie aground at low water. Vessels in the river awaiting an opportnnity to go to a wharf usually anchor off **Fort Jackson,** about 2 miles below the city, as there is no room farther up for large vessels to swing at anchor. Vessels bound out and waiting for high water to cross the bar usually anchor in "The Bight" off Venus Point.

The **Branch Hydrographic Office** of the Navy Department is located at the Custom-House; this office is supplied with the latest information and publications affecting navigation, for the consultation of mariners.

Quarantine.—The National Quarantine Station and boarding station is on the south side of the channel west of Cockspur Island. The quarantine anchorage is a short distance above the station. (See National Quarantines in Appendix IV.)

Hospital.—At Savannah there is a relief station (Class II) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Pilots.—A pilot boat will be found outside the bar or cruising between Martins Industry Light-vessel and the bar. Pilotage is compulsory and only special vessels are exempt. (See the pilot laws, regulations, and rates in Appendix I.)

Towboats will come out over the bar to vessels making signal for one. With a fair wind sailing vessels usually sail into the roads, but a towboat is necessary for sailing vessels between the roads and Savannah.

Supplies.—Coal, either anthracite or bituminous, in large quantities, can be had at the wharves at Savannah. Fresh water is usually brought to shipping by tugs; the river water at Savannah is fresh at any stage of the tide. Provisions and ship chandler's stores can be had in the city or are sent down to the roads in tugs.

Repairs.—The facilities for repairs to the machinery of steamers are good. There are two marine railways; the largest will haul out vessels of 1,200 tons with a draft of 10 feet forward and 17 feet aft.

Storm-Warning Displays of the **United States Weather Bureau** are made on the Board of Trade Building at Savannah and on the Martello Tower at Tybee Island. (For an explanation of these signals see Appendix II.)

Tides.—For tidal data at Tybee Roads see table on page 10. High water occurs at Savannah 1 hour and 4 minutes after high water, and low water 2 hours and 4 minutes after low water at Tybee. The mean rise and fall at Savannah is .3 foot less than at the entrance of the river.

Freshets occasionally occur in the spring but do not endanger the shipping at the wharves at Savannah.

SAILING DIRECTIONS, TYBEE ROADS.

The sailing directions for the Main Channel across the bar are good for a stranger of 15 feet draft in a smooth sea either in the daytime or at night. The directions for entering by the North Slue Channel are good for a draft of 11 feet with a smooth sea in the daytime. Strangers of a greater draft than mentioned above should not attempt to enter the roads without a pilot. The river below Savannah is being improved by the Government, and permanent sailing directions to the city can not be given. Strangers are advised to take a pilot, and not to depend too much on the aids; the latter are changed frequently.

1. ***Approaching from the Eastward.***—I. *To enter by the Main Channel.*—Passing about ½ mile southward of Martins Industry Light-vessel, steer **SW.** by **W.** for 11 miles, when the whistling buoy off the entrance to the Main Channel should be ½ mile distant and in range with Tybee Lighthouse. Then follow the directions in section 2.

Remarks.—The **SW.** by **W.** course carries a depth of 6¼ to 8 fathoms, and leads well clear of the shoals off Port Royal entrance. The whistling buoy off the Main Channel entrance to Tybee Roads should be made on the starboard bow; Tybee Lighthouse bears **WNW.** ¼ **W.** from this buoy, and should be sighted some time before the buoy is made.

II. *To enter by the North Slue Channel.*—Passing ½ mile southward of Martins Industry Light-vessel, steer **WSW.** ⅝ **W.** for 10¾ miles, when the outer buoy at the entrance by the North Slue Channel should be about ¾ mile distant and in range with Tybee Beacon Light bearing **WSW.** ½ **W.** Then follow the directions in section 2 A.

Remarks.—On the **WSW.** ⅝ **W.** course the Sea buoy off the South Channel entrance of Port Royal Sound and Gaskin Bank buoy (black, No. 1) should both be left ¼ mile on the starboard hand. Care should be taken not to be set westward of the course, and Tybee Lighthouse should be kept a little on the starboard bow. When nearly up to the Outer buoy, Tybee Beacon Light should be seen ahead.

1 A. *Approaching from the Southwestward.—To enter by the Main Channel.*—Standing along the coast, when Sapelo Lighthouse bears **WNW.** distant 7½ to 8 miles, steer **NNE.** ½ **E.** for 44 miles.

Or, deep-draft vessels approaching Tybee Roads from sea and having fallen southward of the entrance should use the lead and not get inshore closer than in 6 or 7 fathoms water until Tybee Lighthouse is made.

When Tybee Lighthouse is made do not approach it closer than 5½ miles or in less than 6 fathoms water, and bring the lighthouse and beacon in range to bear **WNW.** at this distance. The whistling buoy off the Main Channel entrance should then be close aboard. Then follow the directions in section 2.

Remarks.—Standing along the coast on the **NNE.** ½ **E.** course the least depth should be 4½ fathoms; care should be taken not to be set northward in the first 12 miles after passing Sapelo Lighthouse. The whistling buoy off the entrance to Sapelo Sound will be sighted ahead and should be left on the port hand. After passing the whistling buoy off Sapelo Sound the sailing line leads well clear of the shoals making offshore. The coast is low and there are no prominent objects until Tybee Lighthouse is sighted well off the port bow. At night when up to the whistling buoy off the entrance to the Main Channel, Martins Industry Light-vessel may be seen. Vessels coming from southwestward will usually find it more convenient to enter by the Main Channel. The North Slue Channel can be more advantageously used in northerly winds by sailing vessels.

2. *Entering and to the Anchorage in Tybee Roads.—By the Main Channel.*—Having followed the directions in sections 1 or 1 A, pass close to the whistling buoy and steer about **WNW.**, keeping Tybee Lighthouse and Tybee Beacon Light on range and passing just southward of the red bell buoy. When abreast the red bell buoy the vessel should be on the Bloody Point Range; then steer about **NW.** ½ **N.**, keeping on this range, and anchor in about 22 feet of water a short distance southwestward of a perpendicularly striped buoy, with Tybee Lighthouse bearing **WSW.** ¾ **W.**

Remarks.—The channel leads over the bar between shoals, and care is necessary to keep the vessel on the range as directed. On the **WNW.** course after passing the whistling buoy, South Breaker buoy (can, black, No. 1) will be left on the port hand.

After passing the bell buoy and when on the **NW.** ½ **N.** course, Inner South Breaker buoy (can, black, No. 3) will be left about ⅜ mile on the port hand. The front range beacon of the Bloody Point range is a square, pyramidal, skeleton structure painted white. Inner buoy (can, white and black perpendicular stripes) should be made nearly ahead. Beacon Point Shoal buoy (can, black, No. 5) will be made well on the port bow.

2 A. *Entering and to the Anchorage.—By the North Slue Channel.*—Having followed the directions in section 1, paragraph II, and having Tybee Beacon Light ahead bearing **WSW.** ½ **W.**, steer for the beacon; pass Outer buoy (white and black perpendicular stripes) leaving it close-to on either hand. Pass southward of North Breaker buoy (nun, red, No. 2), continue the course and pass southward of Inner buoy (can, white and black perpendicular stripes). Anchor southwestward of the latter buoy.

If desiring to anchor in the Roads north of Tybee Island.—From Inner buoy steer **W.**; pass southward of a black bell buoy and black can buoy (No. 1, N.), and keep Tybee Knoll

Spit buoy (nun, red, No. 2) a little on the starboard bow. Pass 100 yards southward of the latter buoy and anchor in 18 feet of water southwestward of it, Tybee Lighthouse bearing **SE.**

Remarks.—When crossing the bar the buoys should be closely followed. When standing from the Inner buoy to the anchorage north of Tybee Island, Tybee Knoll Spit buoy (nun, red, No. 2) should be made and kept a little on the starboard bow and a black bell buoy should be left 300 yards on the starboard hand. The **W.** course carries a least depth of about 15 feet. The anchorage is about 300 yards from the beach.

WASSAW SOUND*

is the first sound southwestward of Tybee Roads; the entrance, which is about 1¾ miles wide, being a little over 6 miles southwestward of Tybee Lighthouse. The sound is about 2½ miles long in a **NE.** and **SW.** direction, and about 2 miles wide in a **NW.** and **SE.** direction. Shoals make off to a distance of 3½ to 4 miles from the entrance, forming a shifting bar through which there is a buoyed channel with a depth of about 13 feet. The distance from the whistling buoy off Tybee Roads to the entrance buoy off Wassaw Sound is about 8 miles. After crossing the bar there is a good channel with 3 to 7 fathoms, which leads along the southern and western part of the sound and for a distance of 6 miles up the Wilmington River. The sound is for the most part very shallow but the channels into its principal tributaries will permit any draft that can be taken over the bar.

Tybee River empties into the sound from northward; it is about 7 miles in length to its junction with **St. Augustine** and **Turners creeks**; by the former it is connected with the Savannah River about 5 miles below the city of Savannah; a depth of 14 feet can be taken through the river but only 7 feet into the Savannah River. The entrance to Tybee River is obstructed by a shoal in Wassaw Sound, over which a depth of 9 feet can be taken into the river. About 2 miles above the mouth of Tybee River it is entered from northeastward by **Lazaretto Creek**; this creek connects the river with Savannah River near its mouth and forms an inland passage with a depth of about 7 feet. Turners Creek connects Tybee River with Wilmington River and has a depth of 7 feet.

Wilmington River empties into Wassaw Sound from northwestward; its general direction for a distance of 8 miles to the village of **Thunderbolt** is about **NW.**; it then turns northward for about 4 miles and joining St. Augustine Creek connects with the Savannah River. The river is important only as being a part of the inland passage from Savannah to Fernandina. A depth of over 3 fathoms can be taken for a distance of nearly 7 miles above its entrance from Wassaw Sound where there is a shoal with 7 feet over it, and this depth can be taken into the Savannah River. **Skidaway River** empties into Wilmington River from southwestward about 5¾ miles above Wassaw Sound; the river is connected by several shallow streams with **Burnside River** and thus with **Vernon River** and Ossabaw Sound. **Isle of Hope,** a village on the west bank of Skidaway River, 3¾ miles above its mouth, can be reached by vessels of 13 feet draft. **Romerly Marsh Creek** enters the western end of Wassaw Sound at the mouth of Wilmington River; the creek is important only as being the principal connection of the inland passage between Wassaw and Ossabaw sounds. The channel is narrow and crooked, and at high water it is confusing even to pilots; it is also shoaling, but is navigable for a draft of about 7 feet. There is another channel through what is known as the **Old Romerly Marsh Channel** and Wassaw Creek; this has been improved by the Government; it is shoaling, but is now used in preference to the channel through the Romerly Marshes.

There are no prominent landmarks that can be readily recognized by a stranger when approaching the entrance. **Wassaw Island,** which forms the southern side of the entrance, is heavily wooded along its seaward side and presents a level, unbroken appearance, while **Tybee Island,** on the northern side of the sound, shows lower with scattered wooded hammocks. Vessels of 10 feet or less draft can easily enter the sound at high water by closely following the buoys. Strangers of over 10 feet draft should take a pilot. Savannah pilots will take vessels into Wassaw Sound.

Tides.—The mean rise and fall is 6.8 feet. High water occurs 15 minutes after high water and low water 5 minutes after low water at Savannah entrance.

Currents.—The tidal currents in Wassaw Sound have considerable velocity and must be allowed for. Advantage may be taken of them on the flood to beat in or on the ebb to beat out; but no vessel, however smart working, should ever attempt to beat against them.

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*Shown on charts **155, 156,** scale $\frac{1}{80,000}$, price of each $0.50; **440,** scale $\frac{1}{40,000}$, price $0.50.

SAILING DIRECTIONS, WASSAW SOUND.

The directions in section 2 are good for a stranger of 10 feet draft in the daytime when buoys can be readily seen, and with smooth water. Strangers of deeper draft should employ a pilot.

1. ***Approaching from the Northward.***—Having followed the directions in section 2, paragraphs I, or II, page 38, pass ½ mile southward of Martins Industry Light-vessel and steer **SW. ½ W.** for 19¼ miles; this course should lead to the Sea buoy (can, white and black perpendicular stripes and letter "W."). From here follow the directions in section 2.

Remarks.—Vessels should keep at least 5 miles from shore between Tybee entrance and Wassaw Sound entrance. In hazy weather the shore will not be visible a distance of 5 miles as the land is low, and the lead will have to be relied upon; a depth of less than 6 fathoms should not be entered until the Sea buoy is sighted. On the **SW. ½ W.** course, the whistling buoy off Tybee entrance should be left about 1½ miles off the starboard beam.

1 A. ***Approaching from the Southward.***—From a position ½ mile eastward of Sapelo Sea buoy, make good a **NNE. ¼ E.** course for 24¼ miles. Or, from Sapelo whistling buoy make good a **NNE.** course for 23¾ miles. Or, from Ossabaw Sea buoy make good a **NE. ¾ N.** course for 10½ miles.

Remarks.—The shoals which make off from the shore are the only dangers to be guarded against; southward of Wassaw Sound the shore must be given a berth of 6 miles to clear them. On the **NNE. ¼ E.** course the land will not be seen until nearly up to the Sea buoy off Wassaw Sound. The **NE. ¾ N.** course leads close to the shoals off the entrance to Ossabaw Sound; the least depth will be about 19 feet. When the Sea buoy is made it should be kept bearing northward of **NE. by N.**

2. ***From the Sea Buoy to the Anchorage.***—From the Sea buoy steer for South Breaker buoy (can, black) course about **WNW. ½ W.**, and leave it on the port hand. Then steer about **NW. by N.** for the North Breaker buoy (nun, red) and leave it on the starboard hand. From this buoy steer about **WNW. ½ W.** for Inner buoy (nun, red) which leave on the starboard hand and steer about **W. ½ N.**, heading so as to leave Cabbage Island Spit buoy (nun, red) on the starboard hand; after passing this latter buoy anchor in 5 to 6 fathoms water.

Remarks.—As the buoys are shifted to indicate the channel, the courses here given should only be used to assist in picking up the buoys; the latter should in every case serve as the guides for entering.

OSSABAW SOUND*

is a broad opening in the shore about 14 miles southwestward of Tybee Lighthouse and 30 miles northeastward of Sapelo Lighthouse. Two large rivers enter from westward, both of which appear as prolongations of the sound for several miles in their respective directions. The greater part of the sound is very shallow, but the two channels to the river entrances have a depth sufficient for any vessel that can cross the bars. Shifting shoals extend seaward off the entrance for a distance of from 3½ to 5 miles, through which two buoyed channels, the northern with a depth of 7 feet and the southern with a depth of 9 feet, lead into the sound. The navigation of these waters is confined to small local vessels and those using the inland passage. Strangers seldom enter the sound or its tributaries. There are no towns or villages of any importance on either the sound or its tributaries.

Vernon River is the northern of the two rivers which enter the sound from westward. A draft of 14 feet can be taken 5 miles up the river and 9 feet about 2 miles farther. **Burnside River** enters Vernon River from northward about 3½ miles, and the **Little Ogeechee River** from westward about 2 miles above its mouth.

Adams Creek enters Ossabaw Sound from northward about 2¾ miles above the entrance. This creek is part of the inland passage and connects with Odingsell River at the **Romerly Marshes**. **Odingsell River** enters Ossabaw Sound from northward at the entrance of the sound.

*Shown on charts 155, 156, scale $\frac{1}{80,000}$, price of each $0.50; 441, scale $\frac{1}{30,000}$, price $0.25.

Ogeechee River is the southern of the two rivers entering the western part of the sound, and is the second largest river on the coast of Georgia. The river is very shallow for the greater part of its length and of little commercial importance. It is navigable for a distance of about 30 miles for small craft. The mouth of the river for a distance of 2¾ miles is part of the inland passage to Fernandina. The **Florida Passage**, which enters the river from southward 2¾ miles above its mouth, connects with Bear River and thus with St. Catherines Sound.

There are no regular pilots for Ossabaw Sound or its tributaries; the buoys are the only guides a stranger can use unless some one with local knowledge is employed, or a Savannah pilot is taken.

Tides.—The mean rise and fall of tides is 6.6 feet. High water occurs 10 minutes after and low water 26 minutes after the times of high and low water at Savannah entrance.

The tidal currents in the sound have considerable velocity and allowance must be made for them. The ebb setting out of the Ogeechee River is particularly strong.

GENERAL DIRECTIONS TO OSSABAW SOUND ENTRANCE.

From Tybee whistling buoy make good a **SW.** ⅝ **S.** course for 18¾ miles. From the Sea buoy off Wassaw Sound make good a **SW.** ¾ **S.** course for 10½ miles. From the Sea buoy off Sapelo Sound make good a **N.** by **E.** ¾ **E.** course for 14 miles.

The above courses lead to the Sea buoy at the entrance to Ossabaw Sound. Vessels of less than 7 feet draft, on a clear day when the buoys can be seen, can stand in through the southern channel by closely following the buoys. Vessels of a deeper draft should not enter without a pilot.

ST. CATHERINES SOUND*

is about 24 miles southwestward of Tybee Lighthouse and 21 miles northeastward of Sapelo Lighthouse; the width at its entrance is 1⅝ miles, it extends westward about 2 miles, and has 3 principal tributaries which are wide at their entrances and appear as prolongations of the sound for several miles in their respective directions. The entrance to the sound is over a shifting bar which extends 5 miles offshore and has a least depth of about 10 feet in the channel, which is marked by buoys. The sound is for the most part shallow, but channels with 3 to 5 fathoms of water lead from inside the bar into the entrances of its tributaries.

Bear River enters St. Catherines Sound from northwestward just inside the entrance; about 8 miles above its mouth the river joins the **Florida Passage** and this affords an inside passage, with a depth of about 6 feet to Ossabaw Sound. A depth of 10 feet can be taken nearly 8 miles up the Bear River and about 3 miles up **Kilkenny Creek**, its principal tributary.

Medway River enters the sound from westward; the channel in some places is narrow, and between shoals, making it extremely difficult to navigate. A depth of about 14 feet can be taken 8 miles above the mouth of the river.

North Newport River enters St. Catherines Sound from southwestward, and with one of its branches (**Johnsons Creek**) and the **South Newport River** forms part of the inland passage to Fernandina.

Walburg Creek, just eastward of North Newport River, has a least channel depth of 8 feet; it connects with the North Newport River about 2½ miles above its mouth. The creek is used by some vessels as a part of the inside passage.

There are no towns on the sound, nor any of importance on its tributaries, all of which are short streams. Strangers seldom enter the sound; there are no regular local pilots, but Savannah pilots will take vessels in over the bar. The buoys are the only guides for entering as there are no natural features that can be recognized by a stranger seeking to enter. On a clear day the entrance may be recognized showing the break between the wooded points on its northern and southern sides.

Tides.—The mean rise and fall of tides is 7.3 feet. High water occurs 29 minutes after high water, and low water 31 minutes after low water at Savannah entrance.

Tidal Currents have considerable velocity at the entrance and in the sound, particularly during spring tides, and care must be taken to avoid being set out of the channel.

GENERAL DIRECTIONS TO ST. CATHERINES SOUND ENTRANCE.

When ½ mile eastward of the sea buoy off Ossabaw entrance, steer **SW.** ⅝ **S.** for 4 miles; this should lead to a position about 1 mile eastward of St. Catherines Sound Entrance buoy.

* Shown on charts 156, scale $\frac{1}{30,000}$, price $0.50; 443, scale $\frac{1}{40,000}$, price $0.25.

Or, from Sapelo Sea buoy steer **N.** by **E.** $\frac{1}{8}$ **E.** for $10\frac{1}{4}$ miles when St. Catherines Sound Entrance buoy should bear **W.** and be distant about 1 mile.

Reliable directions of a permanent nature, for entering can not be given; a stranger should take a pilot. Vessels seeking an anchorage in this locality should enter Sapelo Sound.

SAPELO SOUND*

is a little over 10 miles northeastward of Sapelo Lighthouse and 34 miles southwestward of Tybee Lighthouse. The entrance is obstructed by shoals, which extend nearly 5 miles to seaward, through which there is a buoyed channel with a depth of 18 feet. Inside the entrance the sound stretches westward for a distance of $4\frac{1}{2}$ miles with a width of 1 to $1\frac{1}{2}$ miles and is entered by three large tributaries and several small streams. The sound affords excellent anchorage for any vessel that can cross the bar, and is sometimes used as a harbor by vessels bound into Doboy Sound and unable to cross the bar of the latter on account of a heavy sea; it is also the National Quarantine anchorage for this section of the United States. Vessels of too deep a draft for Doboy or Altamaha sounds enter Sapelo Sound to load lumber, which is brought to them in rafts. The deepest draft that can enter is about 24 feet at high water with a smooth sea.

There are no towns or villages of any importance on the sound, or its tributaries, and no prominent landmarks that can easily be recognized by a stranger from outside the bar.

South Newport River enters the sound from northward just inside the entrance; the river has a channel depth of 11 feet for a distance of 11 miles to its junction with North Newport River, but there are no aids in the river. Entering the sound from northwestward, and about 1 mile west from the mouth of South Newport River, is an unimportant stream known as **Barbours Island River**.

Sapelo River enters the sound from westward; it is of little importance, the channel being narrow, crooked, and full of shoals.

Mud River enters the head of Sapelo Sound from southward; it is a broad shallow body of water important only as a part of the inland passage between Savannah and Fernandina.

Pilots for Sapelo Sound may be found cruising off the bar or off the bars at Doboy or St. Simon sounds. Pilotage is not compulsory unless the vessel is spoken by a pilot. (See Appendix I.)

Anchorages.—There is good anchorage anywhere in the channel of the sound, but vessels entering for shelter usually anchor on either side of Dog Hammock Spit. The quarantine anchorage is off the National Quarantine Station. Vessels entering for cargoes usually anchor off Front or Julienton rivers in the mouth of Sapelo River.

Quarantine.—The National Quarantine Station is at the north end of Blackbeard Island. Vessels with infectious diseases are sent here from ports between Hatteras and St. Augustine. (See National Quarantines in Appendix IV.)

Tides.—The mean rise and fall of tides is 7 feet. High water occurs 19 minutes after high water at Savannah entrance, and low water 5 minutes after low at Savannah entrance.

SAILING DIRECTIONS, SAPELO SOUND.

The directions for entering are good for a draft of 15 feet at low water, strangers of deeper draft should take a pilot.

1. ***Approaching from the Northward.***—From Martins Industry Light-vessel make good a **SW.** $\frac{1}{8}$ **S.** course for 41 miles. Or, from the whistling buoy off Tybee Roads make good a **SSW.** $\frac{3}{8}$ **W.** course for $31\frac{1}{4}$ miles. Or, from Ossabaw Sea buoy make good a **S.** by **W.** course for $13\frac{1}{4}$ miles.

These courses will lead to the whistling buoy off Sapelo Sound, from which the directions in section 2 should be followed.

Remarks.—Vessels approaching Sapelo Sound from northward should give the shore a berth of over 5 miles, to avoid the shoals which extend that distance offshore at the entrances of the sounds. In thick weather the water should not be shoaled to less than 6 fathoms, and a vessel should not stand inside of this depth unless the weather clears. The break in the shore at the entrance to the sound can be seen for a distance of 8 miles to seaward on a clear day, but there are no distinguishing marks that can be recognized from this

*Shown on charts **156**, scale $\frac{1}{80,000}$, price $0.50; **444**, scale $\frac{1}{30,000}$, price $0.25.

distance. The black whistling buoy bears about **E.** ¼ **S.** from the entrance and about **E.** by **N.** distant 2 miles from the Sea buoy. The Sea buoy bears about **E.** ½ **S.** from the south point at the entrance; it is a first-class can, with white and black perpendicular stripes and the letter "S." In ordinary gales breakers will be seen from 1½ to 2 miles southwestward of the Sea buoy and on both sides of the channel 2½ miles from the shore.

1 A. ***Approaching from the Southward.***—From the Sea buoy off St. Andrew Sound make good a **N.** by **E.** ¾ **E.** course for 38½ miles. Or, from a position 2½ miles east of the Sea buoy off St. Simon Sound make good a **N.** by **E.** ⅕ **E.** course for 29 miles. Or, from a position 2½ miles east of the Sea buoy off Doboy Sound make good a **NNE.** ¼ **E.** course for 13¼ miles.

These courses will lead to the whistling buoy off Sapelo Sound entrance and a **W.** by **S.** course should lead to the Sea buoy. From the Sea buoy follow the directions in section 2 for entering.

Remarks.—The shore southward of the entrance should be given a berth of over 5 miles to avoid the extensive shoals which make off from the shore. (See also the remarks under section 1 preceding.)

2. ***From the Whistling Buoy to the Anchorage.***—From the whistling buoy steer **W.** by **S.**; leave the Sea buoy close-to on either hand and steer about **WNW.** for the Entrance buoy (white and black perpendicular stripes); leave this buoy close-to on either hand and continue on the course for Middle Shoal buoy (red, No. 0); leave this buoy on the starboard hand and steer about **NW.** ½ **W.** for Breaker Shoal buoy (can, black) and leave it 200 yards on the port hand. Then steer about **W.** ¼ **S.** for the Channel buoy (can, white and black perpendicular stripes), passing 150 yards northward of Breaker Shoal Inner buoy (black, No. 1½); leave Channel buoy on either hand and continue the course with the Quarantine pier off the north end of Blackbeard Island ahead. Leave the Quarantine pier about 300 yards on the port hand and steer **W.** heading for Dog Hammock Spit buoy (nun, red and black horizontal stripes). Anchor about ¼ mile either northwestward or southwestward of this buoy in 5 or 6 fathoms of water.

Remarks.—When entering, a sharp lookout should be kept for the buoys and the courses laid from one buoy to another; the courses given in the sailing directions will assist in locating the buoys. In no case should a stranger attempt to enter at night or if the buoys can not be seen, and if there is a heavy sea, entering vessels should wait for high water to cross the bar. From Breaker Shoal buoy to the anchorage there is a good wide channel with a least depth of 5 fathoms. On the north side of the channel, inside the entrance, and marking the eastern end of Cedar Hammock Spit, is a buoy (nun, red and black horizontal stripes); the channel into South Newport River leads eastward of this buoy and there is good anchorage in the main channel of the sound about ¼ mile southward of the buoy. The most prominent mark in the entrance is the National Quarantine pier and building off the north end of Blackbeard Island.

DOBOY SOUND AND PORT OF DARIEN*

is 44 miles southwestward of Tybee Roads and 16 miles northeastward of St. Simon Lighthouse. The entrance, which is marked on its northern side by **Sapelo Lighthouse** (see table, page 22), is about 1 mile wide, and like all the other sounds along this coast, is obstructed by shifting shoals which extend offshore to a distance of 4½ miles, forming a bar over which there is a buoyed channel which has a depth of about 10½ feet; about 17½ feet can be taken through this channel at high water with a smooth sea. The sound extends northwestward for a distance of about 5 miles and has an average width of ¾ mile; it is the commercial outlet of numerous tributaries and also of the **Altamaha River**, a tributary of Altamaha Sound and the largest river in the State of Georgia. Doboy Sound is one of the harbors for the shipment of pitch pine timber and lumber.

Duplin River enters Doboy Sound from northward about 1½ miles inside of Sapelo Lighthouse; it is a small stream about 5 miles long and good for a depth of 9 feet some distance above its mouth.

New Teakettle Creek enters the sound from northward about 1 mile northwestward of Duplin River. This creek connects with **Mud River** and forms part of the inland passage; 9 feet is the depth through the creek, but Mud River is shoal, the depth in it being about 5 feet. **Old Teakettle Creek** branches from New Teakettle Creek and joins Mud River farther westward.

*Shown in parts on charts **156, 157**, scale $\frac{1}{80,000}$, price of each $0.50; **446**, scale $\frac{1}{40,000}$, price $0.25.

Atwood River and **Hudson Creek** are small streams emptying into the head of the sound from northwestward. About 7 feet can be taken up the former for a distance of 2½ miles and 9 feet about 3 miles up the latter.

Connegan River enters the head of the sound from southwestward; it joins North River by a branch known as **Buzzards Roost Creek** through which 8 feet may be taken.

North River enters Doboy River just above Doboy Island. It extends westward 5 miles to the post village of **Ridgeville**, to which a draft of 14 feet can be taken. Here it joins **May Hall Creek**, which, running southward, connects with Darien River 5 miles above its mouth. There is a depth of about 13 feet in May Hall Creek, except where it enters Darien River the depth is only 4 feet.

Doboy River is a short continuation of North River from the west end of Doboy Island to Doboy Sound, and through Doboy River both North and Darien rivers may be entered from the sound. **Doboy Island** is on the eastern side of the river at the junction of North and Darien rivers. **Back River** is on the southern side of the island and forms another entrance from the sound to North and Darien rivers.

Darien River extends southwestward for a distance of 11½ miles, where it joins the Altamaha River. The town of **Darien** is 9 miles above Doboy Island on the north bank of the river. A small steamer runs daily between Darien and Brunswick. Up to the town the river is navigable at high water for vessels of 17 feet draft; for a distance of 4½ miles below Darien the river channel has been improved by wing dams which extend out some distance from both banks. Large rafts of timber are usually secured to the banks of the river at and below Darien. There is about 1 foot of water at ordinary low tides into Altamaha River; only light-draft steamers are engaged in the carrying trade on the river. A branch of Darien River known as **Rockdedundy River** connects with Little Mud River from Altamaha Sound and forms part of the inland passage.

South River enters Doboy Sound from southwestward about ¾ mile inside the entrance. It extends in a general westerly direction for 3 miles, where it joins Little Mud River, forming a passage about 4 feet in depth from Doboy Sound to Altamaha Sound.

Pilots will sometimes be found cruising off the entrance of the sound, and if pilots are desired for the inland passage they can be obtained at either Darien or Brunswick. Pilotage is compulsory for certain vessels. (See the pilot laws, regulations, and rates in Appendix I.) Vessels not finding a pilot off the entrance can anchor outside the Sea buoy in about 6 fathoms of water until boarded by one.

Towboats will sometimes be found cruising outside if a vessel is expected to arrive, and they will come out to a vessel signaling for one; the towboats belong to the sawmills on the waters tributary to the sound. All the sailing vessels bound to Darien take a towboat, and when loaded tow out over the bar. Towboats can be had at Darien.

Quarantine.—Vessels with infectious or contagious disease on board or coming from infected ports are sent to the National Quarantine Station in Sapelo Sound or must anchor and remain in Back River until released from quarantine by the health officer. (See Appendix I and National Quarantines in Appendix IV.)

Hospital.—At Darien there is a relief station (Class III) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Anchorages.—There is good anchorage anywhere in the channel of the sound inside the entrance, but vessels usually stand up until abreast the mouth of Doboy River near Folly Marsh Spit buoy. Vessels subject to visitation by the health officer must wait to be boarded in the sound. There is good anchorage in about 21 feet of water in Doboy River, but the channel is too narrow for a large vessel to anchor in Darien River.

Supplies.—Provisions and ship chandler's stores can be had at Darien. Vessels can obtain fresh water from water boats. The nearest places for obtaining coal for steamers are Brunswick and Savannah.

Repairs to hulls of vessels and machinery of steamers can not be made nearer than Savannah. (See also Brunswick Harbor.)

Wharves.—The depth of water alongside the wharves at Darien is 12 to 14 feet.

Tides.—The mean rise and fall of tides is 7.2 feet at Sapelo Lighthouse. High water occurs 22 minutes after high water, and low water 22 minutes after low water at Savannah entrance.

The Tidal Currents have considerable velocity, and vessels must make allowance for them. Vessels should not attempt to beat in against the current, but light-draft vessels handled by skillful pilots may readily beat in with the current.

SAILING DIRECTIONS, DOBOY SOUND.

The following directions for entering are good for a stranger with a draft of 8 feet at low water, and about 14 feet at high water in clear weather and with a smooth sea. Vessels of deeper draft should employ a pilot, and strangers, no matter what their draft, should not attempt to enter at night.

1. ***Approaching from the Northward.***—From Martins Industry Light-vessel make good a **SW.** by **S.** course for 55 miles. Or, from the whistling buoy off Tybee Roads make good a **SSW.** ½ **W.** course for 45 miles. Or, from Sapelo whistling buoy steer **SSW.** ¾ **W.** about 14 miles.

These courses lead to a position 1 mile eastward of Doboy Sea buoy with Sapelo Lighthouse bearing **NW.** by **W.** ½ **W.** about 7 miles distant, and visible on a clear day. Steer for the Sea buoy and when up to it follow the directions in section 2.

Remarks.—While standing along the coast northward of the entrance to Doboy Sound, the shore should be given a berth of over 5 miles to avoid shoals. The **SW.** by **S.** course from Martins Industry Light-vessel leads well offshore; the least depth, about 4½ fathoms, will be found when southward of Sapelo Sound entrance, where the sailing line leads about 7 miles from the shore and outside of the whistling buoy. The **SSW.** ¼ **W.** course leads close to the whistling buoy off Sapelo Sound entrance. When there is a heavy sea on Doboy Bar and vessels are unable to enter they may make an anchorage in Sapelo Sound. As the entrance to Doboy Sound is approached **Sapelo Lighthouse** (see table, page 22) will be seen on its northern side. If the weather is very hazy or thick, soundings should be taken frequently and the shore should not be approached closer than in 6½ fathoms water.

1 A. ***Approaching from the Southward.***—From a position 1¾ miles eastward of St. Marys entrance whistling buoy make good a **N.** by **E.** ⅛ **E.** course for 38¼ miles. Or, from St. Andrew Sea buoy make good a **N.** by **E.** ⅛ **E.** course for 25 miles. Or, from St. Simon Sea buoy make good a **N.** by **E.** ⅞ **E.** course for 16¼ miles.

These courses lead to a position 1 mile eastward of Doboy Sea buoy. Steer for the Sea buoy and when up to it follow the directions in section 2.

Remarks.—The above courses lead well outside the shoals and the least water encountered on the sailing lines should not be less than 4½ fathoms. In hazy or thick weather soundings should be taken frequently and the water should not be shoaled to less then 6½ fathoms. Sapelo Lighthouse bears **NW.** by **W.** ⅛ **W.**, and is distant 6¼ miles from Doboy Sea buoy. On the **N.** by **E.** ⅞ **E.** course from St. Simon Sea buoy care must be taken not to be set northward of the course; the shoals off the entrance to Altamaha Sound are about ½ mile inshore of the sailing line.

2. ***From the Sea Buoy to the Anchorage.***—From the Sea buoy steer about **NW** by **W.** ½ **W.**; leave Outer Bar buoy (can, white and black perpendicular stripes) close-to on either hand and Starboard buoy (nun, red) on the starboard hand; from this buoy steer so as to leave the buoys on the hand indicated by their color until up to the black bell buoy. From the bell buoy steer **WNW.** leaving a red nun buoy about 300 yards on the starboard hand. When Sapelo Lighthouse bears **N.** distant not quite ¾ mile, steer **NW.** by **N.** up the sound. Anchor in 6 fathoms of water when the red nun buoy, which should be seen a little on the port bow, is between ¼ and ½ mile distant.

Remarks.—The buoys on the bar are shifted to indicate the best water, and no permanent courses can be given from buoy to buoy; they are, however, close enough to one another to be easily seen and distinguished in clear weather. Sailing vessels when entering require a good working breeze; the channel is too narrow for a vessel of any size to beat through. From the bell buoy in to the anchorage the channel has a width of about ⅜ mile, with a least depth of 20 feet. By giving the south shore of Sapelo Island a berth of nearly ¼ mile when on the **NW.** by **N.** course, a mid-channel course up the sound will be followed to the anchorage. Vessels bound to Darien should take a pilot or towboat while in the sound.

ALTAMAHA SOUND*

is 5 miles southward of Sapelo Lighthouse and about 11 miles northeastward of St. Simon Lighthouse. The entrance is so much obstructed by shoals and the sound itself is so full of them that it is rarely entered by anyone, and never by strangers. There is a channel with about 6 feet of water through the shoals, which extend out for a distance of 4 miles from the entrance, but this channel shifts and is not marked. The vessels entering the sound usually pass in through Doboy Sound and then through the inland passage; a local pilot is always necessary and can be obtained from near Sapelo Lighthouse or off St. Simon Bar.

Altamaha River is formed by the confluence of the **Oconee** and **Ocmulgee** rivers, 112 miles above the town of Darien, and flows in a general southeasterly direction, entering the western end of Altamaha Sound. This river

* Shown on charts **157**, scale $\frac{1}{80,000}$, price $0.50; **446**, scale $\frac{1}{40,000}$, price $0.25.

is shallow and crooked, but is navigable its entire length for steamboats of about 3 feet draft; the channel is being improved by the United States Government to maintain a depth of 3 feet at low water. Considerable timber is rafted down these rivers for shipment from Darien and Brunswick. The influence of the tides is felt in the river for a distance of about 20 miles above Darien. **Oconee River** is being improved by the United States Government to obtain a channel with a depth of 3 feet to the city of **Milledgeville**, about 126 miles above its junction with Altamaha River. **Ocmulgee River** is being improved by the United States Government and has a channel depth of 3 feet for a distance of 261 miles to the city of **Macon**. The principal cities, towns, and villages on the river, with their distances above the junction with the Altamaha River are: **Lumber City**, 10 miles; **Hollingsworth Ferry**, 86 miles; **Abbeville**, 124 miles; **Hawkinsville**, 167 miles, and **Macon**, 261 miles.

Little Mud River enters Altamaha Sound from northward about 2½ miles inside the entrance. It is important only as being part of the inland passage from Doboy Sound to Altamaha Sound.

Buttermilk Sound enters Altamaha Sound from southwestward. It has an average width of ½ mile, but is full of shoals, through which there is a narrow channel. At its head the sound connects with **Frederica River** and **Mackays River**, the latter connecting with **Back River**. These three rivers enter the western end of St. Simon Sound from northward, and Frederica River with Buttermilk Sound form part of the inland passage, through which a depth of 6 feet may be taken.

Tides.—The mean rise and fall of tides in the entrance to Altamaha River is 6.4 feet. High water occurs 33 minutes after and low water 43 minutes after high and low waters respectively at Savannah entrance.

Note.—Sailing directions of any value can not be given. It is advisable in every case where a vessel desires to enter Altamaha Sound, if coming from northward, to pass into Doboy Sound; or, from southward, to pass into St. Simon Sound, and then through the inland passages to Altamaha Sound. In either case a local pilot will be required.

ST. SIMON SOUND AND BRUNSWICK HARBOR*

lies 17 miles southward of Sapelo Lighthouse and 9 miles northward of Little Cumberland Island Lighthouse. On the northern side of its entrance, which is ⅞ mile wide, is **St. Simon Lighthouse** (see table, page 22). This sound is one of the most important harbors on the coast of Georgia, being the approach to the city of Brunswick, which is the second city in commercial importance in the State. The entrance is obstructed by dangerous shifting shoals, which make offshore to a distance of 5½ miles and through which there was a narrow buoyed channel with a depth of 18½ feet in May, 1900, but this depth is not permanent. A draft of about 24 feet has been taken through this channel at high water with a smooth sea. Inside the crest of the bar and in the channel of the sound there is a good depth of water and excellent anchorage.

Entering the western end of the sound from northward are **Frederica, Mackays,** and **Back rivers.** These all extend northward and connect with Buttermilk Sound, and thus afford a passage into Altamaha Sound. Frederica River is the easternmost of the three rivers and the one used by vessels passing through the inland passage.

Brunswick River enters the sound from southward and just inside the entrance. The river for a distance of 2¾ miles above its mouth has an average width of 1¼ miles, but the deep-water channel averages only a little over ¼ mile in width. Above Brunswick Point the river for a distance of about 2½ miles has an average width of ¾ mile, and above this it is divided into two branches by **Buzzards Island.** The southern branch, a stream of little importance, is known as **Turtle River**, and the northern branch, on which the city of Brunswick is situated, is known as the **East River** or **Brunswick Harbor.** A depth of 4 fathoms can be taken up the Brunswick River and about 4 miles up Turtle River, but there is only 15 feet in the dredged channel leading from Brunswick River into Brunswick Harbor and about 18 feet abreast the city. Vessels load lumber to a draft of 22 feet at the wharves at Brunswick but lie in the soft mud at low water. **Jekyl Creek** enters Brunswick River from southward about 2½ miles above its mouth, and connecting with Jekyl and St. Andrews sounds, to the southward, forms part of the inland passage to Fernandina. A depth of 5 feet at low water can be taken through the dredged channel from Brunswick River into the creek, and the jetty at the northern entrance to the creek is marked by a lighted beacon showing a fixed red light at night.

The city of **Brunswick** is situated on a branch of the Brunswick River about 7¼ miles above St. Simon Lighthouse. Two lines of railroads enter the city, and it has regular steamboat communication with Darien, Fernandina, and intermediate places, and to New York. About 1,000 vessels, including foreign steamships, enter and clear from the port each year.

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*Shown on charts 157, scale $\frac{1}{80,000}$, price $0.50; 447, scale $\frac{1}{40,000}$, price $0.25.

St. Simon Mills is a village on the east bank of the Frederica River about 1½ miles above its mouth. There are several lumber mills situated here, to which a number of vessels go for cargoes. There is 12 feet of water in the channel up to the village, and vessels load to a draft of 18 feet at the mills.

Prominent Features.—In clear weather the lighthouse shows very distinctly at a distance of 8 miles, and from the Sea buoy Little Cumberland Island Lighthouse can be seen to the southwestward. About 1½ miles northeastward of St. Simon Lighthouse is a large hotel. As the entrance is approached the houses, forming a summer resort near the lighthouse on the north side of the entrance, will be distinguished.

Pilots.—Pilot boats usually cruise off the entrance and one boat is always stationed off the bar, except in very heavy weather, when she is anchored inside. Pilotage is compulsory for certain vessels. (See the pilot laws, regulations, and rates in Appendix I.) Pilots for the inland passage can be obtained at Brunswick.

Towboats are usually employed by the larger and deeper draft sailing vessels; they can be had at Brunswick, and one will generally be found off the Sea buoy waiting for a tow.

Quarantine.—The National Quarantine Station is at **Brunswick Point** on the north shore of Brunswick River, about 1½ miles below the city. Vessels subject to visitation by the health officer will be boarded in the sound. (See National Quarantines in Appendix IV.)

Hospital.—At Brunswick there is a relief station (Class III) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Anchorages.—Vessels waiting for a favorable tide to cross the bar can anchor just northward or northeastward of the Sea buoy in about 5 fathoms water, soft bottom. There is good anchorage anywhere in the channel in St. Simon Sound or Brunswick River. Off the city of Brunswick there is anchorage, for small vessels, with a depth of 12 to 25 feet.

Supplies.—Provisions and ship chandler's stores; coal, either anthracite or bituminous, in limited quantities, and fresh water can be obtained at Brunswick.

Repairs.—Light repairs can be made to the machinery of steamers, and there is a small marine railway with a capacity of about 300 tons, but Savannah is the nearest place where large vessels can be hauled out for extensive repairs.

Wharves.—The facilities for loading and discharging cargoes at Brunswick are good, there is from 12 to 18 feet of water alongside the wharves according to locality.

Storm-Warning Displays of the **United States Weather Bureau** are made at Brunswick and at St. Simon Lighthouse.

Tides.—The mean rise and fall in the entrance of the sound is 6.8 feet. High water occurs 36 minutes after and low water 39 minutes after high and low waters, respectively, at Savannah entrance.

The tidal currents follow the general direction of the channel and have a velocity of 1 to 2 knots an hour; allowance must be made for them. Currents turn about 1 hour after high and low water.

SAILING DIRECTIONS, ST. SIMON SOUND AND BRUNSWICK HARBOR.

The directions in section 2 are good at present (1900) for a draft of about 13 feet at low water; strangers of deeper draft should take a pilot. Unless a pilot takes the vessel in, no attempt should be made to enter at night.

Caution.—Vessels of 18 feet or more draft should not approach the entrance closer than in 6 fathoms of water when there is a heavy sea on or in thick weather, unless there is a pilot on board; there is a spot with 27 feet of water over it lying nearly ⅝ mile **E.** of the Sea buoy, and another 2⅝ miles **ESE.** ¼ **E.** from the Sea buoy.

1. ***Approaching from the Northward.***—From Martins Industry Light-vessel make good a **SSW.** ¾ **W.** course for 71 miles. Or, from the whistling buoy off Tybee Roads make good a **SSW.** ⅝ **W.** course for 61 miles. Or, from a position 1 mile eastward of Doboy Sea buoy make good a **S.** by **W.** ⅝ **W.** course for 16 miles.

The courses lead 1 mile eastward of the Sea buoy off St. Simon Sound which lies **SE.** by **E.** ⅛ **E.** distant about 6½ miles from St. Simon Lighthouse. Stand for the Sea buoy and follow the directions in section 2 for entering.

Remarks.—The **SSW.** ¾ **W.** and the **SSW.** ⅝ **W.** courses lead well outside of the shoals and eastward 3 miles and 1 mile, respectively, from Sapelo whistling buoy; the depths while standing on these courses should not be less than 5 fathoms, but care should be taken when on the **S.** by **W.** ⅝ **W.** course not to be set westward and if the water is shoaled to 4 fathoms while on this course, the vessel should be headed offshore. On

a clear day the entrance of the sound can be recognized from a distance of 8 or 9 miles by St. Simon Light house. The wooded point on the south side of the entrance will also be seen before reaching the Sea buoy.

1 A. ***Approaching from the Southward.***—Standing northward along the coast, when Amelia Island Lighthouse bears **W.** distant about 6 miles, steer **N.** ⅝ **E.** for 15¼ miles to the Sea buoy off St. Andrew Sound; from this buoy continue the course for 8½ miles to a position about 1½ miles southeastward of the Sea buoy off St. Simon Sound. Steer for the Sea buoy and follow the directions in section 2.

Remarks.—Between St. Marys entrance and the Sea buoy off St. Andrew Sound the least water found on the sailing line will be 5 fathoms. To be assured of a depth of 7 fathoms or over a vessel must pass 11 miles offshore between St. Andrew Sound entrance and St. Simon Sound entrance, but a depth of 4 fathoms can be carried 5¼ miles from the shore. The Sea buoy off St. Andrew Sound lies 7¼ miles **ESE.** from Little Cumberland Island Lighthouse and on a clear day the lighthouse can be seen from the buoy. (See also the remarks under section 1 preceding.)

2. ***From the Sea Buoy to the Anchorage.***—From the Sea buoy steer **NW.** by **W.** ¼ **W.** for the bell buoy, leave it close-to on the port hand and continue on the course so as to leave the red buoys on the starboard hand, and the black buoys on the port hand, and head for Channel buoy (can, white and black perpendicular stripes); leave this buoy on the port hand and continue the course until up to Junction buoy (spar, red, No. 6½); leave this buoy close-to on the starboard hand, and steer **WNW.** ¾ **W.** keeping the two white beacons of the Plantation Creek Range in line ahead. Leave Jekyl Spit buoy (can, black) 100 yards on the port hand and when about ½ mile past the buoy haul northward, off the range, and anchor in 7 to 9 fathoms of water, soft bottom. Or, if bound to the City of Brunswick follow the directions in section 3.

Remarks.—When crossing the bar strict attention must be paid to the buoys, and they should be left on their proper sides regardless of the courses. A number of spar buoys, properly painted, are kept in position on the bar by the pilots; they are not permanent. The Government buoys on the bar are nun and can shaped. The **NW.** by **W.** ¼ **W.** course after crossing the crest of the bar leads fair for Channel and Junction buoys on the range of St. Simon Lighthouse and beacon. The south shore of St. Simon Island is bold-to near the lighthouse. Jekyl Spit buoy should be made on the port bow a short time after Channel buoy has been passed. The shore of Jekyl Island should be given a berth of at least 300 yards.

A range beacon, showing a white light at night, is on the north side of the entrance. This beacon and St. Simon Lighthouse in range will (in 1900) lead in the channel over the bar.

3. ***From the Anchorage to the City of Brunswick.***—Having followed the directions in section 2, and when about ½ mile westward of Jekyl Spit buoy (can, black, No. 5) and on the Plantation Creek Range, steer **SW.** ⅛ **S.** keeping the two white beacons of the Jekyl Island Range in line ahead. Keep on this range leaving red buoy No. 8 on the starboard hand, and leave red buoy No. 10 about 60 yards on the starboard hand and then steer about **W.** by **S.** Leave red buoy No. 2, off Brunswick Point, about 200 yards on the starboard hand and steer about **WNW.** ⅜ **W.** heading for the two white beacons of the Colonels Island Range. Give the shore on the starboard hand a berth of at least 300 yards and follow it until nearly up to the Buzzard Island Spit buoy (nun, red and black horizontal stripes). When this buoy is about 100 yards distant ahead steer **N.** by **W.** ⅞ **W.** heading so as to leave the wharves at Brunswick about 80 yards on the starboard hand.

Vessels should go to a wharf as there is not room for large vessels to swing while at anchor in the harbor abreast of the wharves.

Remarks.—On the **SW.** ⅛ **S.** course the beacon on the end of the Jekyl Creek jetty and the range beacons for entering Jekyl Creek will be on the port bow. The vessel should not go any to the west of the range. On the **W.** by **S.** course the vessel should be kept well southward of a line from red buoy No. 10 to red buoy No. 2. The north shore of Brunswick river, from Brunswick Point to the entrance of Brunswick Harbor, should be given a berth of at least 300 yards, except at the Quarantine Station, where the depth is 18 feet close up to the wharf. When the course is changed to **N.** by **W.** ⅞ **W.** steamers must slow down to pass along the wharves and through the dredged channel. When standing through the dredged channel the range astern must be kept very closely, as the channel is only about 100 feet wide. (See the regulations for the port in Appendix I.)

ST. ANDREW SOUND, JEKYL SOUND, AND SATILLA RIVER.*

St. Andrew Sound lies about 7 miles southward of St. Simon Sound and 16 miles northward of St. Marys entrance. On the southern point at its entrance is **Little Cumberland Island Lighthouse** (see table, page 22). The sound is 2½ miles wide at the entrance and extends westward about 3 miles to the mouth of Satilla River, which from the entrance appears as a prolongation of the sound. In the sound are extensive shoals, between which channels lead into its principal tributaries, which are known as Jekyl Sound, Satilla River, and Cumberland River. The entrance is obstructed by shoals, which extend offshore for a distance of 5 miles. Through these there is a shifting channel, marked by buoys, which is usually good for a depth of 14 feet at low water. The sound is little used as a harbor. A number of vessels enter Satilla River to load lumber, and the vessels using the inland passage cross the sound. Jekyl Creek and Jekyl Sound from northward, and Cumberland River from southward, are parts of the inland passage connected by St. Andrew Sound.

Jekyl Sound enters St. Andrew Sound from northward just inside the northern point at the entrance. The sound extends northwestward about 2 miles and has an average width of about 1 mile; it is full of shoals, between which there are three channels which lead to its three principal tributaries. **Jekyl Creek** enters the sound from northward; it is part of the inland passage, its northern part connecting with Brunswick River. The bar at its northern entrance at present (1900) has a depth of about 5 feet, but a depth of 12 feet can be taken from Jekyl Sound to the landing on Jekyl Island. **Jointer Creek** enters Jekyl Sound from northwestward; it is crooked and has a number of narrow branches, which connect with Brunswick River above Jekyl Creek. About 12 feet can be taken into the creek at low water, and about 4 miles above its mouth. **Little Satilla River** enters Jekyl Sound from westward; the channel in the river is narrow and crooked and is good for a depth of 12 feet for several miles above its mouth. Jointer Creek and Little Satilla River are of little importance and require local knowledge for their navigation.

Satilla River enters St. Andrew Sound from westward; the mouth of the river, which is about 1¼ miles wide, is obstructed by extensive shoals, between which leads a narrow and winding channel. The river is navigable for light-draft steamers for a distance of 50 miles to the village of **Baileys Mills**, and vessels are taken about 24 miles up the river where they can load lumber to a draft of 16 feet and then finish loading to a draft of 20 feet in Jekyl Sound. There are several buoys placed to mark the channel from St. Andrew Sound into the mouth of the river, but above this there are no aids, and local knowledge is necessary to keep in the channel.

Cumberland River enters St. Andrew Sound from southward just inside the point of Little Cumberland Island; its general direction is southerly for a distance of 11 miles, where it joins Cumberland Sound, thus affording a passage good for a depth of about 6 feet at low water. For a distance of 4½ miles from the north end of Little Cumberland Island the channel of the river is ¼ mile wide, and although it leads between shoals it is easily followed, but above this the channel is narrow, crooked, and subject to changes; a stranger is so apt to run aground that he should not attempt to pass through except on a rising tide. The most difficult part of the passage is at the "Divide" at the north mouth of Crooked River; the bend here is very sharp and the channel very narrow with a depth of 6 feet. **Brickhill River** is a branch of Cumberland River, from which it branches about 5 miles above its mouth and joins again where Cumberland River joins Cumberland Sound. **Floyds Creek** enters Cumberland River from westward about 4½ miles above the north end of Little Cumberland Island. For a distance of nearly 3 miles above its mouth the channel in the creek has a depth of about 19 feet. **Shellbine** and **Delaroche creeks** enter Cumberland River from westward; they are both narrow and crooked, the former is navigable for a draft of 8 feet at low water, and the latter for a draft of 7 feet, but neither creek is of importance.

Pilots will be found cruising off the bar or off St. Simon Bar. The pilot regulations and rates for pilotage for St. Andrew Sound and Satilla River are the same as for St. Simon Sound and Turtle River. Pilotage is compulsory for certain vessels. (See also Appendix I.)

Towboats.—There are no regular towboats in St. Andrew Sound, but vessels desiring to tow up the Satilla River can get a towboat from Brunswick.

Anchorages.—The best anchorage is in the channel, on the western side of Little Cumberland Island; here the depth ranges from 3½ to 4½ fathoms, and the holding ground is good. There is also good anchorage in the entrance to Jekyl Sound westward of the southern end of Jekyl Island, but this is not as convenient as the former.

Tides.—The mean rise and fall of tides in the sound is 6.8 feet. High water occurs 34 minutes after high water and low water 37 minutes after low water at Savannah entrance.

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*Shown on charts 157, scale $\frac{1}{80,000}$, price $0.50; 448, scale $\frac{1}{40,000}$, price $0.25.

SAILING DIRECTIONS, ST. ANDREW SOUND.

The directions for entering are good for a draft of about 10 feet at low water and 15 feet at high water; strangers of deeper draft should take a pilot. A stranger should not attempt to enter at night, or when there is a heavy sea on the bar.

1. ***Approaching from the Northward.***—From Martins Industry Light-vessel make good a **SSW.** $\frac{3}{8}$ **W.** course for 79 miles. Or, from a position 1 mile eastward of Doboy Sea buoy, make good a **S.** by **W.** $\frac{1}{8}$ **W.** course for 25 miles. Or, from St. Simon Sea buoy, make good a **S.** $\frac{1}{4}$ **E.** course for 9 miles.

These courses will lead to the Sea buoy off St. Andrew Sound, from which the directions for entering in section 2 should be followed.

Remarks.—The **SSW.** $\frac{3}{8}$ **W.** course leads well outside of the shoals. On the **S.** by **W.** $\frac{1}{8}$ **W.** course the least water should be about 5 fathoms. The Sea buoy off St. Andrew Sound lies $7\frac{1}{4}$ miles **SE.** by **E.** $\frac{1}{8}$ **E.** from Little Cumberland Island Lighthouse; if the weather is hazy the lighthouse can not be seen from the buoy. In thick weather the shore should not be approached closer than in 7 fathoms.

1 A. ***Approaching from the Southward.***—Standing along the coast from the southward pass 6 miles eastward of Amelia Island Lighthouse, and when the lighthouse bears **W.** steer **N.** $\frac{5}{8}$ **E.** for $15\frac{1}{4}$ miles. This course will lead to the Sea buoy off St. Andrew Sound, from which the directions in section 2 should be followed for entering.

Remarks.—While southward of the entrance the shore must be given a berth of over 5 miles to avoid shoals. The least water on the sailing line should be 5 fathoms or more. (See also the remarks under section 1 preceding.)

2. ***From the Sea Buoy to the Anchorage.***—From the Sea buoy steer about **W.**, heading for the bar buoy (can, white and black perpendicular stripes). Leave this buoy close-to on either hand, and steer about **NW.** for Outer North Breaker buoy (nun, red, No. 2); leave buoy No. 2 on the starboard hand and steer about **WNW.** for Inner North Breaker buoy (nun, red, No. 4), which should also be left on the starboard hand. From red buoy No. 4 steer about **NW.** $\frac{1}{2}$ **W.** for Mid-channel buoy (can, white and black perpendicular stripes); leave this buoy close-to on either hand, and continue the course, heading so as to pass about 100 yards northward of Pelican Spit buoy (can, black, No. 1). Leaving this buoy on the port hand steer about **W.** by **N.** and pass 400 yards southward of Horseshoe Shoal buoy (nun, red and black horizontal stripes). When Little Cumberland Island Lighthouse bears **SSE.** $\frac{1}{4}$ **E.**, and is distant about $\frac{1}{2}$ mile, steer **SSW.** Give the shore of Little Cumberland Island a berth of about 350 yards, and anchor when the lighthouse bears **NE.** in $3\frac{1}{2}$ to $4\frac{1}{2}$ fathoms water, soft bottom.

Remarks.—When crossing the bar the buoys must be closely followed and no attempt should be made to enter unless the buoys can be seen. The channel is subject to change and the buoys are shifted when necessary; the courses given in section 2 until up to the Mid-channel buoy only serve to locate the buoys approximately for anyone entering. The channel on the western side of Little Cumberland Island, for a distance of $1\frac{3}{4}$ miles from its northern end, is from 500 to 800 yards wide, and its eastern edge leads along about 100 yards from the shore of the island.

CUMBERLAND SOUND AND ST. MARYS ENTRANCE*

is 15 miles southward of Little Cumberland Island Lighthouse and 19 miles northward of St. Johns River. **Amelia Island Lighthouse** (see table, page 22,) is about 2 miles southward of the entrance. The sound extends northward and, connecting with Cumberland River, forms an inland passage to St. Andrew Sound; it is also the approach to the city of Fernandina and the town of St. Marys. The entrance, which is about 1 mile wide, is obstructed by shifting shoals which extend off for a distance of $2\frac{1}{4}$ miles from the shore and form a bar over which there is a buoyed channel which in May, 1900, had been improved by dredging to a depth of about $16\frac{1}{2}$ feet; this depth, however, is not permanent. The channel leads across a submerged jetty, which extends in

*Shown on charts 157, 158, scale $\frac{1}{80,000}$, price of each $0.50; 453, scale $\frac{1}{20,000}$, price $0.25.

a general **ENE. ½ E.** direction to the bar from the shore 1⅝ miles northward of Amelia Island Lighthouse. Inside the bar the depths in the channel range from 3½ to 8 fathoms. Vessels drawing as much as 22½ feet cross the bar at high water of spring tides; this draft can be taken to Fernandina. Improvements are being made with a view of obtaining a deep-water channel between the jetties.

St. Marys River is the principal tributary to Cumberland Sound and enters it from westward; the town of **St. Marys** is situated on the north bank about 4 miles above its mouth. This river has a good channel and is navigable for vessels of 18 feet draft to St. Marys and 14 feet draft to the village of **Colerain**, about 67 miles above the town of St. Marys; vessels of 11 feet draft can go 12 miles farther up, and light draft steamers run to **Traders Hill**, at the head of navigation and about 93 miles above the town of St. Marys. (The distances here given are those stated by the pilots on the river, and it is probable that they are greater than the true distances.) The channel is but little obstructed by shoals, but as the river is crooked and runs through a heavily wooded region it is difficult for vessels to navigate under sail, and towboats are generally employed at Fernandina or St. Marys by vessels bound up the river.

Amelia River enters the sound from southward just inside the entrance; the city of **Fernandina** is situated on the east bank about 2 miles above its mouth. About 2⅝ miles above Fernandina is **Kingslands Creek**, through which the **South Amelia River** is entered; the latter river extending southward to Nassau Sound forms an inland passage between the two sounds. **Bells River** enters the Amelia River from westward opposite the city of Fernandina; the former river joins the St. Marys River about 1¼ miles above the town of St. Marys and has a narrow and crooked channel. **Jolly River** branches eastward from Bells River about 6 miles above the mouth of the latter and empties into Cumberland Sound at the mouth of the St. Marys River. The city of Fernandina has railroad communication with Jacksonville and Western Florida, and steamboat communication with New York, Brunswick, and St. Marys. Considerable lumber, phosphate, and some naval stores are shipped from the port. About 300 vessels enter and clear from the port yearly, many of them foreign.

Prominent Features.—Amelia Island Lighthouse and a large water tower near the lighthouse are first recognized when approaching the entrance. When near the whistling buoy off the bar the high water tank on the south end of Cumberland Island will be plainly visible. **Fort Clinch**, a red brick structure with guns mounted en barbette, will be seen on the north end of Amelia Island.

Pilots will usually be found cruising outside the bar; their headquarters are at Old Fernandina. Pilotage is compulsory for vessels not owned in the State of Florida. (See pilot laws, regulations, and rates in Appendix I.) Pilots for the inland passages can be obtained at Fernandina. The pilot regulations and rates and harbor regulations for the port of Savannah have been adopted for the port of St. Marys.

Towboats.—Sailing vessels usually employ a towboat when crossing the bar or if bound up the St. Marys River; towboats are to be had at Fernandina.

Quarantine.—The quarantine boarding station for Fernandina and the St. Marys River is near Fort Clinch. Vessels bound to Fernandina must not proceed above the quarantine station until they have been visited by the health officer. Vessels with infectious disease on board are sent to Sapelo. Quarantine regulations are published from time to time by the Florida State Board of Health. (See Appendix I, also National Quarantines Appendix IV.)

Hospital.—At Fernandina there is a relief station (Class III) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Anchorages.—There is good anchorage in the channel of Cumberland Sound and in the Amelia River up to the city of Fernandina.

Supplies.—Provisions and ship chandler's stores can be had at Fernandina and St. Marys. Coal, both anthracite and bituminous, can be had at the wharves in Fernandina. Fresh water can be obtained at the wharves and from water boats at Fernandina, and be taken from the St. Marys River about 30 miles above its mouth.

Repairs.—There are no special facilities for repairs to vessels or machinery of steamers. Jacksonville and Savannah are the nearest places where vessels can be hauled out and where there are facilities for extensive repairs.

Wharves.—The facilities for loading and discharging vessels are good, the depth alongside the wharves at Fernandina is 16 to 25 feet according to locality, and at St. Marys from 18 to 20 feet.

Storm-Warning Displays of the **United States Weather Bureau** are made at the custom-house in Fernandina and can be seen from the shipping in the harbor.

Tides.—For tidal data see the table on page 10.

Tidal Currents.—No reliable information of value to the mariner can be given in regard to the currents at the entrance to the sound, as their set is being changed by the jetties. The currents in Amelia River set nearly with the channel and have a velocity of 1 to 1½ miles an hour.

SAILING DIRECTIONS, ST. MARYS ENTRANCE AND FERNANDINA HARBOR.

The depth and direction of the channel over the bar at the entrance changes from time to time, and the buoys are changed when practicable to indicate the best water. Only directions of the most general character can be given for crossing the bar with a draft of 12 feet in the daytime with a smooth sea. Strangers and vessels of over 12 feet draft are advised to take a pilot.

1. ***Approaching from the Northward.***—Standing along the coast from northward, the shore should be given a berth of 6 miles or more until Amelia Island Lighthouse bears **SW. ¾ W.** Or, from St. Andrew Sea buoy steer **S.** by **W.** for 12 miles, when Amelia Island Lighthouse will bear **SW. ¾ W.**

With the lighthouse bearing **SW. ¾ W.** steer for it on the bearing until up to the whistling buoy off the entrance. From this buoy follow the directions in section 2 for entering.

Remarks.—For the greater part of the distance between St. Andrew Sound and St. Marys entrance shoals make off from the shore for a distance of 5 miles; but abreast of the entrance the shoals extend offshore only about 2½ miles. On a clear day Amelia Island Lighthouse should be seen about 9 miles. If there is a heavy sea or swell no stranger should attempt to enter.

1 A. ***Approaching from the Southward.***—Standing along the coast and passing about ½ mile eastward of the whistling buoy off St. Johns River entrance, steer **N. ½ W.** for 18¼ miles. The whistling buoy off St. Marys entrance should then be ½ mile distant ahead and the bell buoy should be on the port beam. Steer for the bell buoy and when up to it follow the directions in section 2 for entering.

Remarks.—The least depth on the **N. ½ W.** course is about 5½ fathoms, and the Sea buoy off the entrance to Nassau Sound will be left nearly 1¼ miles on the port hand. The northern end of Amelia Island should be given a berth of 2¾ miles until nearly up to the whistling buoy off St. Marys entrance. On a clear day Amelia Island Lighthouse will be seen when off the entrance to Nassau Sound. (See also the remarks under section 1 preceding.)

2. ***From the Whistling Buoy to the City of Fernandina.***—From the whistling buoy steer for the bell buoy. Leave this buoy on the port hand and steer about **W. ¾ N.**; leave the red buoys on the starboard hand and the black buoys on the port hand, and take care to leave Jetty Crossing buoy (black, No. 3) about 20 yards on the port hand. Continue on a **W.** by **N.** course until on the Tiger Island North Range and stand in on the range, course about **W. ¼ N.** until Tiger Island South Range beacons are in line, then steer for the beacons, course about **S.** by **W. ¾ W.** for ½ mile; then haul more southward and follow the shore on the port hand, giving it a berth of 200 yards until nearly abreast Old Fernandina. Steer **S.**, giving the shore at Old Fernandina a berth of about 320 yards, and anchor in 3½ to 6 fathoms water; or, continue southward, following the port-hand shore at a distance of 150 yards to the wharves at Fernandina.

Remarks.—In standing across the bar the buoys are the only guides. Care must be taken not to mistake a couple of steamboat boilers which are wrecked on the shoal northward of the channel; these boilers, in hazy weather, and from a distance, may somewhat resemble can buoys When up to Jetty Crossing buoy the bar has been crossed and the vessel will pass through the narrow gap in the south jetty (the currents here have considerable velocity); the **Tiger Island North Range beacons** (two white skeleton structures) should be seen on the western shore of the sound northward of Fort Clinch. When standing on this range, and Fort Clinch is a little abaft the beam, **Tiger Island South Range beacons** (two white skeleton structures) will be seen southwestward and just clear of the northwestern point of Amelia Island. Before the vessel is on the latter range Amelia River will be fairly opened out to the southward. When standing on the Tiger Island South Range a red and black horizontally striped buoy will be left on the starboard hand.

When standing up the Amelia River care should be taken to avoid a shoal with 8 feet of water over it which lies in the middle of the river 500 yards **E.** by **N.** from the front beacon of the Tiger Island South Range. This shoal is avoided by giving the shore on the port hand a berth of 200 yards and passing eastward of it. Abreast of **Old Fernandina** the shoals make offshore to a distance of 225 yards, but above the village the port hand shore can be approached as close as 100 yards. Shoals extend off 250 yards from the western bank of the Amelia River near Fernandina.

NASSAU SOUND*

is 10 miles southward of Amelia Island Lighthouse and 6 miles northward of St. Johns River Lighthouse. The entrance is about 1½ miles wide but inside the sound is about ¾ mile wide and stretches northwestward about 2¼ miles to its junction with South Amelia and Nassau rivers. The entrance is obstructed by shifting shoals which extend about 1¼ miles seaward and form a bar over which the channel depth is about 4 feet; but there are no aids, except the Sea buoy off the entrance, to assist a stranger in entering. Vessels desiring to enter Nassau Sound should obtain a pilot off St. Johns River entrance. **Nassau River** is navigable for some distance by small vessels but is at present of no commercial importance. South Amelia River, which enters the sound from northward, connects with Kingsleys Creek, and through the latter has communication with Amelia River and Cumberland Sound; the depth through this passage is about 4 feet. The mean rise and fall of tides is about 5.4 feet. High and low waters occur about 1 minute later than high and low waters at Fort Clinch, Fernandina.

INLAND PASSAGE SOUTH OF WINYAH BAY.†

GENERAL REMARKS.

The following descriptions and directions will be found useful in connection with the charts of the localities. The intricacies of the passage and the prevailing marsh through which it leads, render any attempt at detailed directions of no value.

From Winyah Bay, North Carolina, to St. Johns River, Florida, there is an uninterrupted chain of inland water communication through the creeks, rivers, and sounds which border the coast. A description of the most general character only can be given of this inland passage, as it leads mostly through marsh land that presents no natural features easily recognized by a stranger, and there are but few buoys or ranges to indicate the channels. A local knowledge of the tides is necessary to prevent grounding in the shallower parts, and no stranger should attempt the passage without a pilot.

The streams connecting the inlets and sounds are all subject to tidal ebb and flow and receive their waters generally from both ends; at the meeting of the tides there is usually a shoal called the "**divide.**" In most of the streams the ebb tide forms a shoal in the eddy below the points, and the sharper the bend the larger the shoal. These are called "**ebb tide Shoals.**" As a rule the bottom is soft, the exceptions being in a few streams near the coast, in which there are oyster beds, and in the phosphate rock bottoms in South Carolina and part of Georgia.

From Winyah Bay to Charleston the passage has a depth of only about 5 feet at high water and is not recommended. A smooth sea and high water are necessary to cross Bull Bay, and weather that will permit crossing the bay will not prevent a small vessel from going outside, which is shorter, and entering the passage from Bull Bay, or continuing on to Charleston.

From Charleston to Beaufort a draft of about 7 feet can be taken by taking advantage of high waters at the shoaler parts of the passage.

From Beaufort to Savannah a draft of 12 feet can be taken, but only by vessels of less than 150 feet length, on account of the narrow and crooked channel in Skull Creek.

From Savannah to Fernandina a draft of about 8 feet can be taken by taking advantage of the tides: a draft of about 9 feet can be taken through the passage to Fernandina after passing through the Romerly Marshes, and some sections of the passage are good for a draft of 12 feet by taking advantage of the tides.

From Fernandina to St. Johns River the passage has only a depth of 1¼ feet at low water, and about 3½ to 5 feet at high water. On account of its depth and the difficulty of keeping in the channel of Sisters Creek the passage is rarely used, and is impracticable except for small boats.

Pilots.—To avoid unnecessary delay and worry a stranger should take a pilot. There are pilots for the inland passage at Georgetown, Charleston, Beaufort, Port Royal, Savannah, Darien, Brunswick, St. Marys, and Fernandina; but it is sometimes difficult to get one pilot who will take a vessel all the way through from Winyah Bay to Fernandina. There are no regular rates for pilotage; an agreement is usually made with the pilot as to the distance he will take the vessel and his charges.

GENERAL DESCRIPTION AND DIRECTIONS.

From Winyah Bay to Charleston—70 miles.—The entrance to the Estherville-Minim Creek Canal is a little more than 6 miles below the City of Georgetown in Winyah Bay. This

*Shown on chart 158, scale $\frac{1}{80,000}$, price $0.50.

†See Index Map in this volume for charts.

canal has a depth of 7 feet at high water, a width of 50 feet, and length of about 4½ miles. Entering Minim Creek from the canal, the course leads southward and then westward so as to pass north of Little Crow Island, then up the North Santee River 5¼ miles to Six Mile Creek; thence 3 miles through the creek, which is narrow and crooked, into South Santee River, and about 4 miles down the latter to Alligator Creek. A least depth of 4½ feet can be carried from the time of entering the North Santee until entering Alligator Creek. The passage leads through Alligator Creek, where the depth is about 3 feet in several places, through Ramhorn Creek, Needles, and down Cassino Creek, across the entrance to Mud Bay, through Cape Romain Harbor, and into Romain River by the passage north of Marsh Island. The passage through Alligator Creek, Ramhorn Creek, and Needles is narrow and crooked, and the rise and fall of tides is about 3 feet. Following Romain River, or Sett Creek, the passage leads across Five Fathom Creek into Bull River and down this river to its entrance into Bull Bay. Here it is necessary to wait for high water to cross the flats in Bull Bay, and good anchorage in 10 to 13 feet of water is found in the mouth of Bull River. The distance from South Santee River to Bull Bay is about 18½ miles. From the mouth of Bull River the passage is along the north shore of Bull Bay, crossing the mouth of Long Creek and Harbor River, and then in a general southwesterly direction across the bay to Bull Harbor; the distance across the bay to the mouth of Bull Creek is about 9 miles, and the depth across the flats at ¾ flood is about 4 feet. The mean rise and fall of tides in the passage between Cape Romain Harbor and Bull Harbor is about 4½ feet.

A draft of 5 feet can be taken through from Santee River to Charleston by waiting for two tides of ordinary high water.

The passage between Bull Bay and Charleston Harbor is obstructed by a number of "divides" which run nearly dry at low water and over which the mean rise and fall of tides is 4½ to 5 feet. This part of the passage, 22½ miles in length, is very narrow and crooked in places and difficult to follow on account of its numerous branches. Entering Bull Creek the passage leads up the creek through Bull Narrows, where the first "divide" is encountered, which has a depth of ½ foot; it then leads across Prices Creek into Santee Pass and along the south shore of Mark Bay; here there is another "divide" with a depth of about 2 feet. The passage continues through Santee Pass, entering a branch of Capers Creek, and thence to Capers Inlet. Crossing the inlet a good anchorage is found off the northeast end of Dewees Island for vessels waiting for high water to pass through Long Island Narrows. From here a vessel should start at ¾ flood and follow the passage through Bull Yard Sound, crossing Dewees Creek, then through Seven Reaches to Morgan Creek and up the latter about ¼ mile and into the narrow slue to starboard known as Long Island Narrows (Meeting Reach). The passage leads through the narrows, where there are depths of only 1 foot, and crosses Breach Inlet, entering Conch Creek leading about **WSW.** from the inlet, and following it. Pass through Sullivans Island Narrows to The Cove, which is eastward of Moultrieville in Charleston Harbor. Crossing The Cove pass through the drawbridge and northward of the northwestern end of Sullivans Island and into the lower anchorage in Charleston Harbor.

From Charleston Harbor to Port Royal—90 miles.—Vessels of over 100 feet in length sometimes experience difficulty in rounding some of the sharp bends which are encountered in the passage, the channel of which in some places is extremely narrow and crooked. Wappoo Creek should be entered from Ashley River at ½ flood so as to reach Church Flats, the first "divide," about 14 miles distant, before high water. Passing through Wappoo Creek (which has been straightened somewhat by 2 cuts and has a depth of about 6 feet) the passage leads into and up Stono River a distance of 11 miles to Church Flats, where the depth in a narrow channel is about 3 feet. The bottom from the time of entering Stono River until nearly up to Church Flats is mostly phosphate rock. Care should be taken not to enter Rantowles Creek. About 2 miles above Church Flats the broad part of Wadmelaw River (usually known as Wadmelaw Sound) is entered, and through a very crooked and difficult channel for part of the way, the passage leads for a distance of 8¾ miles to North Edisto River, and down the latter about 1¾ miles to the mouth of Dawho River, which enters from westward. On the north bank of Wadmelaw River about 6 miles below Church Flats is Youngs Island, a post village and terminal of a branch of the C. & S. R. R.

Dawho River is about 14½ miles long between North and South Edisto rivers; measured in a straight line the distance is a little less than 6 miles; the channel is tortuous and in some places quite narrow, but 2 miles above the North Edisto River a mid-river course can generally be followed. The passage leads from the western entrance of Dawho River down the south Edisto River for a distance of 4½ miles, the channel leading through extensive shoals, to the mouth of Mosquito Creek, which enters it from southwestward. Here it is necessary to wait for high water to cross the "divide" in Mosquito Creek, and the best place for steamers to anchor is just below the marsh island in South Edisto River below the mouth of Dawho River, where the river water is fresh and steamers can fill up. The depth over the "divide" is about 1½ feet, and the mean rise and fall of tides about 6 feet. Mosquito Creek is one of the most narrow, crooked, and difficult parts of the passage; it is about 7¾ miles long and should be entered about 1 hour before high water. The passage leads from the western entrance to Mosquito Creek down the Ashepoo River 8½ miles to the main channel of St. Helena Sound.

From St. Helena Sound pass up the Coosaw River, 14½ miles, following the ship channel to Brickyard Creek, which enters Coosaw River from westward. Entering Brickyard Creek the passage leads through the creek into Beaufort River and down the latter to Port Royal, the distance from Coosaw River to Port Royal being 12⅓ miles. The channel from Coosaw River into Brickyard Creek has been improved by the United States Government and now has a depth of 7 feet and width of 200 feet, except for a short distance where the width is about 55 feet.

Bound northward from Port Royal the time of starting should be arranged so as to arrive at the Ashepoo River entrance to Mosquito Creek about 1 hour before high water, so as to carry the best water over the "divide." The distance from Port Royal to Mosquito Creek is about 36 miles.

In fine weather time may be saved by running outside between Charleston and St. Helena Sound. The distance by this route is about 18 miles shorter and the delay of waiting for at least one high water is avoided.

There are two rarely used passages connecting St. Helena Sound and Port Royal Sound other than the one described above; one leading up the Coosaw River, through Whale Branch and down Broad River; the other leading from St. Helena Sound, through Harbor River, Story River, and Station Creek. The latter requires smooth water to cross the shoals in the entrance to St. Helena Sound.

From Port Royal to Savannah—42 miles.—If the weather is fine and there is a smooth sea it is advisable to take the passage leading through Tybee Roads, and this passage is the one generally used. If the passage by the way of Cooper River is taken the start from Port Royal should be made so as to reach Ramshorn Creek about 1 hour before high water, the distance being about 25 miles. From Port Royal the passage leads down Beaufort River to Port Royal Sound and across the sound, the distance to the entrance of Skull Creek being 11 miles. Skull Creek is full of shoals and islands, but there is a very crooked and narrow channel with a least depth of about 12 feet through the creek. Passing through Skull Creek, a distance of 4¾ miles, the passage leads down Mackays Creek and Calibogue Sound to the mouth of Cooper River, a distance of 5 miles. Here the passage by the way of Tybee Roads leads southward and the other leads westward into Cooper River. Following the former route the passage leads through the entrance of Calibogue Sound across the shoals, separating it from Tybee Roads and from Tybee Roads up the main channel of the Savannah River about 15 miles to the city of Savannah.

From Calibogue Sound the route through Cooper River leads up the river about 3¾ miles to Ramshorn Creek, which should be entered about 1 hour before high water on account of the "Divide," which has a depth of about 5 feet over it. Passing out of Ramshorn Creek, southward of the small island at its western entrance, the passage leads about 2¼ miles southwestward through New River to Walls Cut, through the cut and down Wrights River about 2 miles, then across the shoals at the entrance and into the main channel of Savannah River, following the channel for a distance of 11 miles to the city of Savannah. It is proposed to improve and shorten this passage by making a cut to enter the Savannah River at Venus Point. The mean rise and fall of tides in the passage between Port Royal and Savannah is about 6½ feet.

From Savannah to Fernandina—130 miles.—From Savannah to Darien the distance is 78 miles, and to Brunswick 103 miles. Steamers on this route do not draw over 6 feet to avoid being delayed by the shoals. The shoalest part of the passage is through the Romerly Marshes, where the depth is 3 feet. There is a passage from Wassaw Sound to Odingsell River by which the passage through the marshes is avoided; this passage leads through a small creek, known as Old Romerly Marsh Channel and then through the New Cut, which has a depth of 5 feet, into Wassaw Creek and down the latter to Odingsell River and up the river to Adams Creek where it joins the passage through the marshes. A depth of about 5 feet can be taken through this passage, which is now generally used. A vessel leaving Savannah should regulate her time of departure so as to enter Old Romerly Marsh Creek about 1 hour before high water; the distance is about 20 miles. By following the passages through Wilmington River, or, through Lazaretto Creek, Tybee River, and across Wassaw Sound, a least low water depth of 7 feet can be carried to Romerly marshes.

From the city of Savannah the passage leads down the ship channel of the river about 3½ miles and then through the gap in the jetty southward of Elba Island a little over 1 mile into St. Augustine Creek. Or, vessels can stand down Savannah River and enter Lazaretto Creek from Tybee Roads. When about 1 mile above the entrance to St. Augustine Creek the passage enters Wilmington River, which bends westward at its junction with the creek. The passage then continues for a distance of 14½ miles down the Wilmington River to Romerly Marsh Creek, which enters it from westward at its mouth in Wassaw Sound. If necessary to wait for the tide, good anchorage is found in Wilmington River about ½ mile above the mouth of Romerly Marsh Creek; or, if coming from southward, in Vernon River off the mouth of Adams creek. The passage through Romerly Marshes is seldom used; at high water of spring tides nearly all the landmarks are covered and experienced pilots find it difficult to keep in the channel. The mean rise and fall of tides in the Romerly Marshes is about 6 feet; westerly winds cause a lower range of tides. Enter Old Romerly Marsh Channel, which makes southward just inside the mouth of Romerly Marsh Creek, and pass through New Cut into Wassaw Creek and down the latter to Odingsell River; stand up the river and into Adams Creek and down the creek to its mouth, then diagonally across the mouth of Vernon River and through a narrow passage known as Hell Gate, which leads westward of a large marshy island (Raccoon Key) and into the Ogeechee River. The passage is up the Ogeechee River about 3½ miles, and northward of the Middle marsh, to the entrance of Florida Passage, which enters the river from southward; then through Florida Passage and Bear River, a distance of 10½ miles, to St. Catherines Sound.

From the mouth of Bear River the passage leads across St. Catherines Sound between Medway Spit and the Middle Ground, and enters North Newport River at the eastern side of its entrance, then 4½ miles up the river to Johnsons Creek and 5½ miles through the latter into South Newport River and down the latter river into Sapelo Sound. Crossing Sapelo Sound the passage leads through Mud River. This is a broad shallow stream, full of shoals and flats with a channel depth of only 5 feet. Here it may be necessary to wait for the tide, which has a mean rise and fall of about 7 feet. Vessels bound south can anchor in Sapelo Sound at the mouth of Mud River; or, if bound north they can anchor in Doboy Sound off the mouth of New Teakettle Creek to wait for the tide. About 4¼ miles above the entrance of Mud River the passage leads southward for a distance of 4¾ miles through New Teakettle Creek into Doboy Sound. The passage leads across Doboy Sound through the branch of North River known as Doboy River, thence through the Rockdedundy River into and through Little Mud River to Altamaha Sound. The channel between Doboy and Altamaha sounds leads between shoals, and in the mouth of Little Mud River the 7-foot channel is very narrow and difficult to keep at low water.

Crossing Altamaha Sound between the shoals, the passage leads through Buttermilk Sound into and through Frederica River to St. Simon Sound. The distance from the mouth of Little Mud River in Altamaha Sound to St. Simon Sound is 19 miles; the mean rise and fall of tides is about 6½ feet. During the last 2 hours of the ebb the water in Buttermilk Sound is fresh. The channel leads between the extensive shoals in Altamaha and Buttermilk sounds and is difficult for a stranger to follow. Crossing St. Simon Sound the passage leads into Brunswick River on the eastern side of its entrance, and up the river 2¼ miles to the entrance of Jekyl Creek. The entrance to the creek has been improved by a jetty and

by dredging, but the depth at present (1900) is about 5 feet and the mean rise and fall of tides is about 6½ feet. Vessels waiting for the tide to enter the creek can anchor in the channel of Brunswick River, if coming from northward; or, in Jekyl Sound, if coming from southward. The passage leads through Jekyl Creek into Jekyl Sound and thence across the entrance to St. Andrew Sound into Cumberland River and through it to Cumberland Sound.

The least depth in the channel usually followed from St. Andrew Sound to Fernandina is about 5 feet and the distance is 23 miles; a least depth of 7 feet will be found by going up the north mouth of the Crooked River and down the south mouth to avoid Horseshoe Shoal. The passage leads through Cumberland River into Cumberland Sound and down the latter into Amelia River to Fernandina. The channel in many places is quite narrow and leads between shoals which are subject to changes. At the mouth of Crooked River, about midway between St. Andrew Sound and the entrance to Cumberland Sound, is a sharp curve in the channel around what is known as the Horseshoe Shoal or "The Divide;" this is also the shoalest part of the channel and the point where the tides from St. Andrew and Cumberland sounds meet. The mean rise and fall of tides is about 6½ feet.

COAST FROM ST. JOHNS RIVER ENTRANCE TO CAPE FLORIDA.*

From the mouth of St. Johns River the coast has a general trend of about **SSE.** for 125 miles to Cape Canaveral, and is broken by three inlets—St. Augustine, Matanzas, and Mosquito. There are no prominent natural features along this stretch of coast, consisting as it does of sand beach, showing an almost continuous range of sand hills backed by woods; these woods in the vicinity of Cape Canaveral and for a distance of 17 miles northward from it are farther back from the shore and are consequently less distinct when seen from seaward. **False Cape** is the name given to a small part of the coast lying 9 miles northward of Cape Canaveral, which it somewhat resembles when seen from seaward.

At St. Augustine Inlet, Mosquito Inlet, and Cape Canaveral are lighthouses (see page 24), which will be the first object visible in approaching the inlets and cape from seaward.

Southward of Cape Canaveral the coast makes a sharp bend westward for a few miles then curves gradually southward, which direction it holds for about 15 miles, it then trends **SSE.**, approaching closely to a straight line for 88 miles to Lake Worth Inlet. This stretch of coast is formed almost entirely by a low narrow strip of sand, which lies at a distance of 1 to 2 miles from the mainland, from which it is separated by the shallow waters of Banana and Indian rivers (see descriptions). Seen from seaward, the coast shows a line of sand beach with many more or less conspicuous hillocks partly covered with coarse grass and scrub palmetto; behind all is the background of heavy woods on the mainland. There are four small breaks in this coast—Indian River Inlet, St. Lucie Inlet, Jupiter Inlet, and Lake Worth Inlet. None of these inlets are of importance; the depth on the bars at their entrances are variable, and generally a depth of only 3 or 4 feet at low water can be relied on.

Jupiter Inlet is marked by Jupiter Inlet Lighthouse, and near it is a station of the United States Weather Bureau where storm-warning displays are made and with which vessels may communicate by use of International Code flags.

From Lake Worth Inlet the coast trends about **S. ½ W.** for about 65 miles to Cape Florida and is broken by two unimportant inlets—Hillsboro and New River. This stretch of coast is very similar to that northward (previously described) and is without marked natural features.

Depths.—The soundings along shore from the mouth of St. Johns River southward until within 17 miles of Cape Canaveral are very irregular in depth. Except off St. Johns River and St. Augustine entrances, 5 to 7 fathoms can be taken to within less than 1 mile, and 3 fathoms within less than ⅛ mile of the beach. At a distance of 12 to 16 miles between **N.** and **NNE. ½ E.** from St. Augustine Lighthouse, and lying from 4 to 9¼ miles from the shore, is a broken shoal with spots that have from 5 to 6 fathoms over them. Spots with 7¼ to 7½ fathoms over them will be found in several places about 10 miles from the shore. The shoals off Cape Canaveral and False Cape are fully described on page 40.

From Cape Canaveral to New River Inlet, a distance of about 150 miles, 4 to 6 fathoms can be taken to within 1 mile of the beach except in the vicinity of the following named shoals (see descriptions, page 41): Thomas Shoal, Indian River Shoal, Capron Shoal, Pierce Shoal, St. Lucie Shoal, and Gilberts Shoal. About midway

* Shown in parts on charts 13, 14, scale $\frac{1}{400,000}$, price of each $0.50; 158, 159, 160, 161, 162, 163, 164, 165, scale $\frac{1}{80,000}$, price of each $0.50.

between Cape Canaveral and Jupiter Inlet there is a shoal with 4¾ fathoms over it lying 10 miles from the shore; this is the farthest outlying shoal on this stretch of the coast. From New River Inlet to Cape Florida, the southern extremity of Key Biscayne, shoal water will be found in places from 1 to 3 miles from the shore.

Abreast the mouth of St. Johns River the 20-fathom curve is 45 miles offshore and extends in a general **S.** by **E.** direction, gradually approaching the shore until abreast Cape Canaveral it is only 18 miles offshore. Within 10 miles of the shore the soundings are irregular, 5 to 7 fathoms being found as much as 9½ miles offshore and 10 fathoms within less than 2 miles of the shore.

Abreast Cape Canaveral the 20-fathom curve is about 18 miles offshore, but it extends in a general **S.** by **E.** direction, gradually approaching the shore, until abreast Lake Worth Inlet (about 10 miles southward of Jupiter Inlet Lighthouse) it is only 2 miles from the shore. Inside the 20-fathom curve the depth is very irregular and soundings are of but little use to determine the distance from shore.

From Lake Worth Inlet to Cape Florida the 20-fathom curve runs nearly parallel to the shore and for the greater part of the distance is less than 2 miles from the beach; inside the curve the shoaling is very rapid and 6 to 8 fathoms are found in places 1½ miles from the beach.

The currents along the coast from St. Johns River entrance to Cape Florida are influenced both in direction and velocity by the direction and force of the wind. The currents across the shoals in the vicinity of Cape Canaveral will generally be found setting with the wind; during or just after heavy easterly or southeasterly gales the western limit of the Gulf Stream will be found close to, if not actually crossing, these shoals.

ST. JOHNS RIVER.*

This river, the largest and most important of eastern Florida, is about 300 miles in length. It rises near the Atlantic Coast, in about latitude **28° 10′ N.**, flows in a northerly direction nearly parallel to the coast, and empties into the sea immediately south of **Fort George Island**, in latitude **30° 25′ N.**, about 18½ miles southward of the entrance to Cumberland Sound. The river is the approach to the city of Jacksonville and a large number of towns and villages and is navigable for steamers of 9 feet draft to **Welaka**, 91 miles above its entrance; steamers of less than 5 feet draft can go up as far as **Sanford** and **Enterprise**, two towns on **Lake Monroe**, 135 miles above Jacksonville. A depth of 4 feet will be found in the river channel as far as **Floating Islands**, about 235 miles above Jacksonville. The head of navigation for vessels of 10 feet draft is **Palatka**, 49 miles above Jacksonville; the lumber mills about 10 miles above Palatka are about as high up the river as sailing vessels usually go, as the river is narrow and very crooked above Palatka.

The entrance of the river is obstructed by a shifting sand bar, which is being improved by the construction of jetties, between which the channel depth is 13 feet. From Mayport, which is 3 miles inside the outer end of the jetties, to **Dame Point**, a distance of 11 miles, the river is full of shoals, between which the channel is quite narrow and winding; this stretch of the river has been improved by dredging and the construction of jetties; in 1900 the channel had a least depth of 15 feet. Above Dame Point a channel depth of 18 feet can be carried to the city of Jacksonville. The channel over the bar is marked by buoys and in the river by beacons, which are lighted at night, but even with these aids it is difficult for a stranger to navigate below Dame Point. The deepest draft taken out of the river is 18 feet, but only 16½ feet draft could be taken between Jacksonville and Mayport. The upper part of the river, between Jacksonville and Palatka, a distance of 49 miles, is comparatively easy to navigate.

Mayport is a village on the south bank of the river, 3 miles inside the ends of the jetties. Opposite Mayport, on the north bank, is a village known as **Pilot Town**. The small steamer running on the river below Jacksonville makes landings at both villages. A branch railroad is being constructed between Jacksonville and Mayport.

The city of **Jacksonville** is on the north bank of the river, 23 miles above the ends of the jetties. Large quantities of lumber, naval stores, and produce are shipped to northern ports. The city has railroad communication with the North, West, and South, and steamboat communication with Charleston, Philadelphia, New York, Boston, and with up-river landings as far as Enterprise and Sanford, a distance of 135 miles.

Prominent features.—Mount Cornelia, 63 feet high and thickly wooded, is the highest land on the coast between Cape Hatteras and Key West; it is about 2 miles northward of the entrance and forms a prominent landmark when approaching. **St. Johns River Lighthouse** is on the south side of the entrance among trees and does not show well in the daytime until nearly up to the ends of the jetties. At night the light can not be seen when coming from southward until it bears about W.

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* Shown on charts **158**, scale $\frac{1}{80,000}$, price $0.50; **454a**, scale $\frac{1}{30,000}$, price $0.40. The river above Jacksonville is shown on charts **468**, scale $\frac{1}{80,000}$, price $0.25; **458**, scale $\frac{1}{80,000}$, price $0.40; **455b**, **455c**, **455d**, scale $\frac{1}{40,000}$, price of each $0.40.

Pilots will generally be found cruising outside the bar, or they will come out to a vessel making signal for one. Sometimes when the pilot boats can not go out to vessels the pilots will come out in a towboat. The bar pilots always keep a lookout for approaching vessels. Up-river pilots can be obtained at Jacksonville. Bar pilotage is compulsory for certain vessels. (See pilot laws, regulations, and rates in Appendix I.)

Towboats are used by all sailing vessels for crossing the bar and in the river as far as Jacksonville. A towboat is usually stationed at Mayport or Pilot Town ready to go out to any vessel making signal outside the bar. Towboats can always be had at Jacksonville for towing up or down the river.

Quarantine.—The quarantine boarding station is at Mayport. Vessels subject to visitation by the health officer must wait to be boarded below the quarantine flag, which is displayed on the south bank of the river nearly opposite Pilot Town. (See Quarantine, State of Florida, in Appendix I, and National Quarantines in Appendix IV.)

Hospital.—At Jacksonville there is a relief station (Class III) of the U. S. Marine-Hospital Service. (See Appendix IV.)

Anchorages.—Vessels outside the bar waiting for high water to enter the river can, if the wind and sea are not too heavy, anchor in 4½ to 5 fathoms about 3 miles northeastward of the lighthouse. The best and usual anchorage inside the mouth of the river is in the channel abreast Mayport; the bottom is sand, but the anchorage is sheltered from all winds. It is advisable for vessels which anchor here to sight their anchors at least once a week. The anchorage abreast the city of Jacksonville has a depth of about 10 fathoms and the best bottom is just above the s ipyard; off the western end of the city the bottom is rocky and vessels anchoring here are liable to lose anchors.

Supplies.—Provisions can be obtained at Jacksonville and Mayport. Ship chandler's stores, anthracite and bituminous coal, and water can be obtained alongside the wharves at Jacksonville. The supply of water at Mayport and Pilot Town is limited to what is caught in cisterns during rainy weather, and vessels can not depend on getting a supply below Jacksonville.

Repairs.—There are two marine railways at Jacksonville, the largest has a capacity for hauling out vessels 260 feet long and about 1,200 tons, draft forward 9 feet, aft 13 feet. The facilities for repairs to vessels are excellent. There are several machine shops where ordinary repairs to the machinery of steamers can be made; at one of these shops forgings weighing 2,500 pounds can be made, and there is a crane with a lifting capacity of 50 tons; the nearest place for larger repairs to machinery is Savannah.

Wharves.—The depth of water alongside the wharves at Jacksonville is 12 to 17 feet, according to locality. The facilities for loading and discharging cargoes are good.

Storm-Warning Displays of the **United States Weather Bureau** are made on the building at the corner of Bay and Hogan streets and are visible from the river. They are also displayed at Fort George Island on the north side of the river entrance, but do not show well to vessels outside the bar.

Tides.—The mean rise and fall of tides at the entrance between the jetties is 4.6 feet; at Mayport, 4.3 feet; at Fulton, 2.8 feet; at Dame Point, 1.8 feet, and at Jacksonville 1 foot. High water occurs 1 hour 42 minutes and low water 1 hour 31 minutes later at Jacksonville than at the jetties. (See also the table on page 10.)

Currents.—The tidal currents have considerable velocity, but as a rule follow the direction of the channel; where the latter is contracted by shoals or the river banks, the current has too much velocity for a sailing vessel to stem except with a strong fair wind. At Mayport the ebb current begins 2 hours 11 minutes after high water and the flood current 2 hours 27 minutes after low water. The duration of the ebb is 6 hours 39 minutes and of the flood 5 hours 46 minutes. Continued rains and strong westerly winds increase the duration and velocity of the ebb current.

GENERAL DIRECTIONS TO THE ENTRANCE OF ST. JOHNS RIVER.

Sailing directions of a permanent character for entering the river can not be given; the narrow channel between the jetties had a depth of 13 feet in the spring of 1900, but its permanence was not established. The buoys are shifted to indicate the channel, but it is not safe for a stranger to attempt to enter the river without a pilot or towboat, and no stranger should attempt to enter at night. Vessels outside the entrance, waiting for the tide, will find good holding ground in 4½ to 5 fathoms water with St. Johns River Lighthouse bearing **SW.**, distant a little over 3 miles, and Mount Cornelia bearing **W. ½ N.**

The ranges in the entrance to the river can not always be depended on to lead in the best water on account of the shifting channel.

I. ***Approaching the entrance from the northward.***—Being southward of St. Marys entrance, stand to the southward giving the shore a berth of about 2½ miles. There is a

whistling buoy off the entrance about 1 mile eastward of the ends of the jetties; when near this buoy take a pilot or towboat. (See the remarks following.)

II. *Approaching the entrance from the southward.*—Being northward of St. Augustine Inlet, stand northward giving the shore a berth of 2 to 3 miles until the whistling buoy off the entrance is made or St. Johns River Lighthouse bears **W. ½ S.** and is distant 3 miles; then take a pilot or towboat.

Remarks.—There are several spots with 27 to 30 feet of water over them lying 4½ miles from the shore between St. Marys entrance and St. Johns River. In a heavy sea vessels should keep 5 miles from the shore to avoid them. In the night St. Johns River Light is the principal guide for the entrance, but on account of the trees which surround the light it can not be seen when approaching from southward until it bears about **W.** In the daytime Mount Cornelia, a hill over 60 feet high and about 2¼ miles northward of the lighthouse, will usually be distinguished before the lighthouse is sighted. The range beacons in the entrance to the river can not always be depended on to lead in the best water on account of the frequent changes in the channel. There are several spots with 5 to 6 fathoms over them lying from 4 to 9¼ miles from the shore between St. Augustine Inlet and St. Johns River.

ST. AUGUSTINE INLET*

is the entrance to St. Augustine Harbor and the approach from sea to the city of St. Augustine; the inlet is about 30 miles southward of the entrance to St. Johns River and is marked on its southern side by **St. Augustine Lighthouse.** The entrance to the inlet is obstructed by a shifting shoal which extends 1½ miles seaward and forms a dangerous bar over which the channel depth is about 6 feet. Buoys are placed to mark this channel, and shifted when necessary to indicate the best water, but vessels of 8 feet draft or over should not attempt to enter except near high water, and a stranger should always take a pilot. Although there is good anchorage inside of the inlet it is not used as a harbor of refuge because in easterly gales the sea makes the bar impassable even for small vessels.

Tolomato or **North River** enters the inlet from northward just inside the point of the **North Beach**; it rises about 15 miles northward of the inlet, has an average width of ¼ mile and a depth of 15 feet for several miles from its mouth. At present this river is of no particular importance.

Matanzas River enters the inlet from southward; it is about 13 miles long to Matanzas Inlet and separates Anastasia Island from the mainland. Above the city of St. Augustine the river has a narrow channel with a depth of 10 feet for a distance of 8 or 10 miles. At the "divide" there is only 3 feet of water, and 6 feet is about the greatest draft that can be taken through to Matanzas Inlet with a favorable tide.

The city of **St. Augustine** is situated on the west bank of Matanzas River opposite the north end of Anastasia Island; it is of little commercial importance, but a popular winter resort. Vessels should make inquiries from local pilots as to the depth over the bar before taking a charter. There is 9 feet of water alongside of the wharf.

Pilots.—Pilots will come out to a vessel if the sea on the bar will permit. Pilotage is compulsory for certain vessels. (See pilot laws, regulations, and rates in Appendix I.) The deeper draft sailing vessels desiring to enter should take a towboat from Jacksonville to cross the bar.

Quarantine.—The quarantine boarding station at North Beach is marked by a yellow flag, above which no vessel subject to visitation by the health officer is allowed to pass before being boarded. (See also Appendix I and National Quarantines in Appendix IV.)

Anchorages.—There is a good anchorage in the channel inside North Beach Point in about 4 fathoms water. Abreast the city of St. Augustine there is good anchorage in 12 to 23 feet of water, according to locality.

Supplies.—Provisions, water, and bituminous coal in limited quantities can be had alongside the wharf at St. Augustine.

Repairs.—The nearest place for repairs to vessels or machinery of steamers is Jacksonville.

Tides.—The mean rise and fall of tides is 4.2 feet. High and low waters occur about 6 minutes after high and low waters, respectively, at Charleston, S. C. (See also the table on page 10.)

GENERAL DIRECTIONS, ST. AUGUSTINE INLET.

When approaching St. Augustine Inlet the shore should be given a berth of at least 1½ miles, so as to keep outside the Sea buoy.

* Shown on chart 159, scale $\frac{1}{80,000}$, price $0.50.

No stranger, however light his draft, should think of attempting to enter without a pilot, as the channel shifts frequently and no information as to buoys or courses would be reliable for any length of time. The channel has a depth of 6 feet at low water, the mean rise and fall of the tide being about 4 feet. Pilots will come off if signal is made for them and the state of the bar is such that they can get across. A vessel bound to St. Augustine should telegraph the probable date of her arrival off the bar, so that a pilot will be sure to be on the lookout for her.

Having crossed the bar, there is a good channel with 3½ to 6 fathoms close along the beach of Anastasia Island. Vessels may anchor here if they get across too late to proceed, but the holding ground is not good till inside North Beach Point. From that anchorage two channels lead into the Matanzas River. The one close around Black Point has about 9 feet at high water. The other around the marshy island off that point has nothing less than 13 feet at low water, but it is only about 100 yards wide for nearly ½ mile. Off the city the river is ⅝ mile wide, and a vessel may anchor there in 12 to 23 feet, soft bottom.

MATANZAS INLET*

is 11 miles southward of St. Augustine Lighthouse; it affords an outlet for **Matanzas River**, which extends northward to St. Augustine and southward, following the coast for a distance of 8 or 10 miles, to **Graham Swamp**, in which it takes its rise. The inlet is obstructed by a bar, over which the high water depth is only about 6 feet, and on which, with easterly winds, the sea breaks at all times. Matanzas River southward of the inlet is shallow and navigable only for small boats; the river northward of the inlet is described under the heading "St. Augustine Inlet." Sailing directions that would be of use to a stranger can not be given. The shore in the vicinity of the inlet can be approached as close as ½ mile.

MOSQUITO INLET†

is about 53 miles southward of St. Augustine Lighthouse and 41 miles northwestward of Cape Canaveral Lighthouse; about ¾ mile northward of the entrance to the inlet is **Mosquito Inlet Lighthouse** (see table, page 24). The entrance, which is about ½ mile wide, is obstructed by shifting shoals, which extend about ¾ mile seaward and form a bar, over which the channel depth ranges from 5 to 7 feet. Vessels of about 7 feet draft can enter the inlet at high water and with a smooth sea, but the services of a pilot are necessary for any stranger, as the channel changes frequently and there are no buoys to mark it. Pilots will come out to a vessel making the pilot signal outside the bar.

Halifax River extends north from the inlet about 25 miles, running parallel to the beach, from which it is separted by a low strip of land only ¼ to ½ mile in width. For a distance of 6 miles from the inlet the depth in the channel is not less than 8 feet; for a distance of 14 miles farther the depth is 3 to 8 feet, above which the depth is 2 feet. **Port Orange, Daytona,** and **Ormond** are the principal landings on the river.

Hillsboro River extends southward from the inlet for a distance of 16½ miles to Mosquito Lagoon. The river in some places is narrow and crooked, but the channel is deep in many places, and by closely following it a least depth of 4 feet can be taken through to Mosquito Lagoon. The only place of any importance on the river is **New Smyrna,** which is situated on the west bank 3 miles above the inlet; a depth of about 10 feet can be taken up to the town.

The long chain of interior waters, including Halifax and Hillsboro rivers, which skirt the east coast of Florida, form parts of the proposed and much talked of inland passage from the St. Johns River to Biscayne Bay.

Tides.—The mean rise and fall of tides in the inlet is 2.3 feet. High water occurs 4 minutes after high water and low water 16 minutes after low water at Fort Clinch, Fernandina.

INDIAN RIVER‡

is, properly speaking, a long, shallow lagoon varying in width from 4 miles to a few hundred feet; it extends along just inside the coast from latitude 28° 48′ N. about 107 miles in a southerly direction and is connected

*Shown on chart 159, scale $\frac{1}{80,000}$, price $0.50. †Shown on chart 160, scale $\frac{1}{80,000}$, price $0.50.

‡Shown in parts on chart 161, 162, 163, scale $\frac{1}{80,000}$, price of each $0.50.

with Jupiter Inlet by a chain of narrow waters about 13 miles long. From a point about 17 miles southward of Cape Canaveral to Jupiter Inlet, Indian River and its connecting waters are separated in many places from the Atlantic only by narrow strips of beach; and in two places north of Jupiter Inlet this beach is broken by inlets, through which, in fine weather, small craft can enter the river. In a large portion of Indian River the channel depth is 8 to 10 feet, but there are many places with depths of but 3 feet.

There are a number of towns and villages on the river, the principal ones being **Titusville, Rock Ledge, City Point, Georgiana, Eau Gallie, Melbourne, Fort Pierce, and Eden.** The Florida East Coast Railway extends along parallel to the west bank of the river and has stations at all the towns and villages. The only entrances to the river are through Indian River Inlet, St. Lucie Inlet, and Jupiter Inlet, and the draft of the vessels entering is limited to a little less than 4 feet. (See description of the inlets for the draft that can be taken into them.)

Eastward of the northern end of Indian River and extending along the coast for a distance of about 17 miles is **Mosquito Lagoon,** an unimportant shallow body of water having an average width of about 2 miles. Mosquito Lagoon is connected with Indian River by a canal, and northward with Hillsboro River by several narrow and shallow streams; through these there is a passage for small boats of less than 3 feet draft from Indian River to Mosquito Inlet and thence into Halifax River.

Between Indian River and Cape C naveral and extending for a distance of 27 miles along the coast is **Banana River,** a large shallow lagoon with an average width of 2½ miles for the greater part of its length. Banana River is separated from Indian River by **Merritt Island,** but may be considered as a branch of Indian River as it is connected with the latter at its northern end by a shallow, crooked stream called **Banana Creek,** and at the southern end by a deep but narrow passage, which is opposite and a little southward of Eau Gallie. A draft of about 4 feet can be taken the whole length of Banana River and through the southern passage, but only 2 feet can be taken through Banana Creek.

These waters are only navigated by small sailboats and the light-draft steamers plying on the Indian River between the towns and villages on its banks.

INDIAN RIVER INLET*

is about 60 miles southward of Cape Canaveral and 35 miles northward of Jupiter Inlet Lighthouse. Shoals extend seaward for a distance of ¾ mile from the entrance, over which the channel depth is about 5 feet, and this depth can be taken into Indian River through a dredged channel 100 feet wide in Negro Cut. The inlet communicates with Indian River, but is only used by small local craft and by them at high water with a smooth sea. There are no buoys to mark the channel, which shifts with every easterly gale. The mean rise and fall of tides is about 1½ feet. High and low waters occur about 8 minutes before high and low waters, respectively, at Fort Clinch, Fernandina.

ST. LUCIE INLET*

is a break in the beach about 13½ miles northward of Jupiter Inlet Lighthouse; it forms one of the approaches from seaward to Indian River. The inlet has a depth of about 15 feet in the entrance, but inside the depth is only 3 feet, and this is the best depth that can be taken through into Indian River. Outside the inlet there is a ridge or reef extending some distance parallel with the coast, over which the depth is about 8 feet. Strangers should not attempt to enter the inlet, as it is constantly shifting.

JUPITER INLET†

is 94 miles southward of Cape Canaveral and 82 miles northward of Fowey Rocks Lighthouse. The inlet connects with the long chain of inland waters which skirt the coast, but its entrance is obstructed by a bar with about 3 feet of water in the channel, and is only entered by small local craft at high water with a smooth sea. Northward of the entrance and nearly ½ mile back from the beach is **Jupiter Inlet Lighthouse** (see table, page 24). Near the lighthouse is a **Storm-Warning Display Station** of the United States Weather Bureau with which vessels may communicate by use of the International Code and be reported by telegraph.

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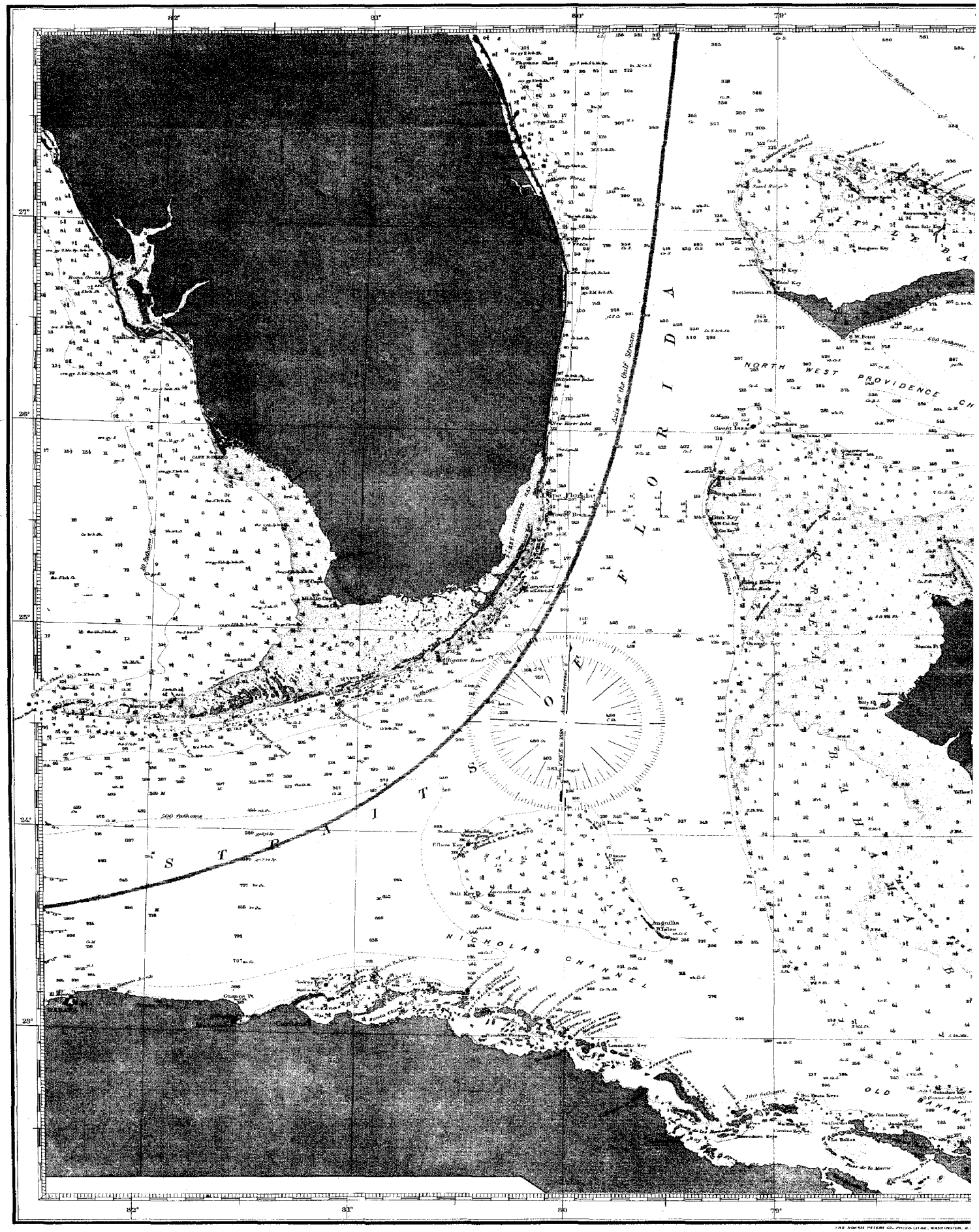
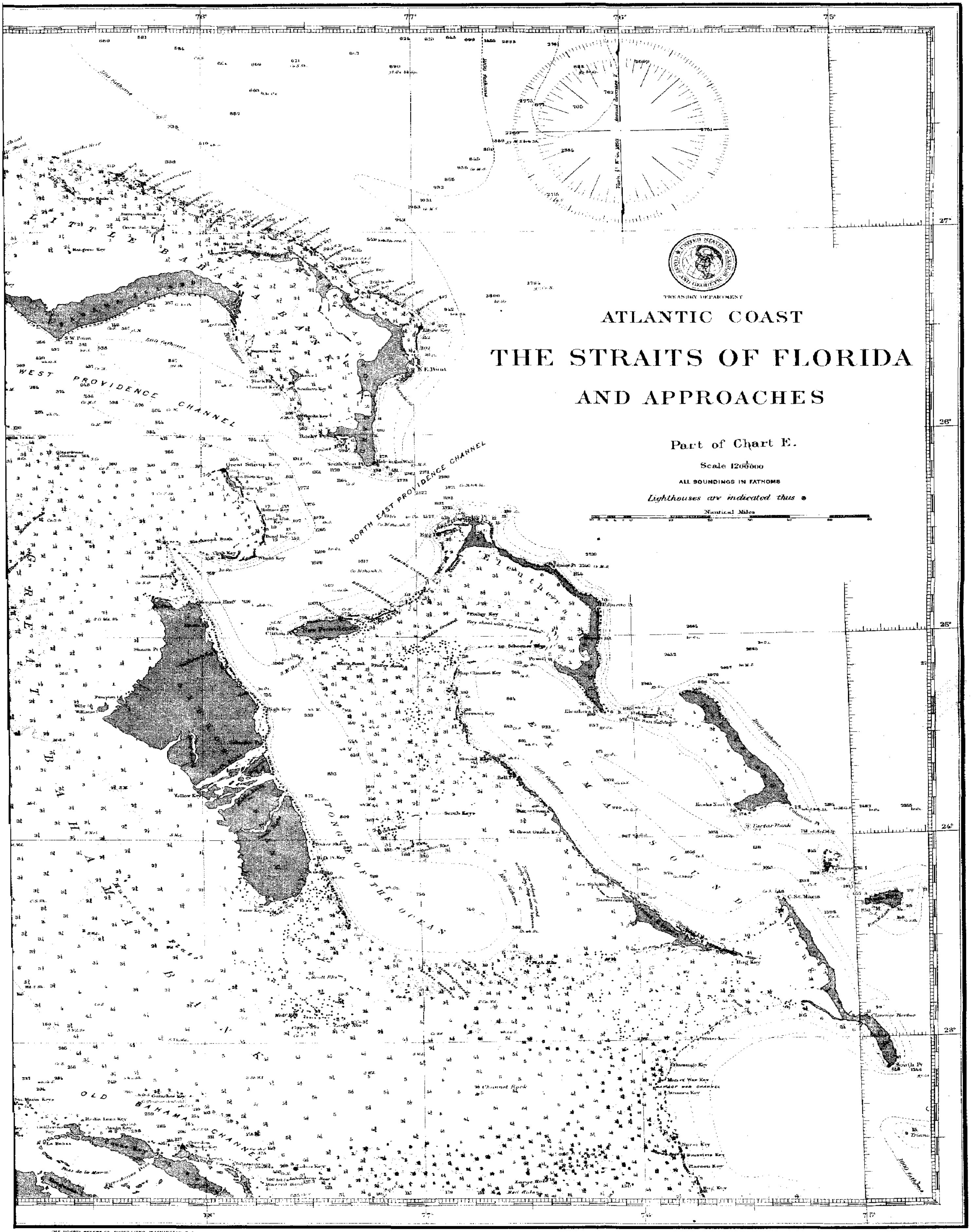
*Shown on chart **163**, scale $\frac{1}{80,000}$, price $0.50.

†Shown on chart **164**, scale $\frac{1}{80,000}$, price $0.50.



THE HOMER PETERS CO., PHOTO LITHO., WASHINGTON, D.C.



THE NORRIS PETERS CO., PHOTO LITHO., WASHINGTON, D.C.

LAKE WORTH INLET*

is 9¾ miles southward of Jupiter Inlet Lighthouse and connects with **Lake Worth**, a shallow body of water extending 18¾ miles along the coast with an average width of ½ mile. The inlet is very shallow and only small craft can enter with a smooth sea. About 4¾ miles southward from the inlet is **Palm Beach**, a fashionable winter resort; the large hotels and long pier at this place form prominent landmarks for vessels standing along the coast.

HILLSBORO INLET*

is 42 miles southward of Jupiter Inlet Lighthouse and is the approach to a narrow, shallow stream known as **Hillsboro River**. The inlet has a depth of about 2½ feet and can only be entered by small boats with a smooth sea.

NEW RIVER INLET*

is nearly 28 miles northward of Fowey Rocks Lighthouse and communicates with **New River**, a narrow stream which extends northward about 5 miles and is separated from the Atlantic only by a narrow strip of beach. The depth on the bar, under favorable conditions, is about 4 feet, and 6 feet can be carried some distance up New River. It requires local knowledge and a smooth sea to cross the bar, and it should not be attempted by a stranger.

KEY BISCAYNE BAY†

is a large, shallow body of water, commencing in latitude **25° 55′ N.** and extending in a southerly direction about 33 miles to **Card Sound**. For the first 10 miles the bay has a width of about 2 miles and is separated from the Straits of Florida by a very narrow peninsula, which terminates at a shallow opening called **Norris Cut**, through which a depth of 5 feet can be taken at high water. For the remainder of the distance the average width of the bay is nearly 7 miles and it is separated from Hawk Channel by a number of keys and coral banks, between which there are several narrow and shallow passages. A great part of the bay has depths of 9 and 10 feet; a draft of about 11 feet can be taken in through the principal passage to Cape Florida Anchorage and to the town of Miami, at Miami River entrance, by local pilots at high water.

Cape Florida Channel is one of the passages into Key Biscayne Bay and also leads to Cape Florida Anchorage; it is sometimes used by vessels of 8 feet or less draft that are bound through the Hawk Channel. The buoyed channel through this passage commences 2⅝ miles **W.** from Fowey Rocks Lighthouse, and follows the buoys in a general northerly direction past **Cape Florida** (the southern end of Key Biscayne) and then to the westward into Key Biscayne Bay. Cape Florida Anchorage is on the western side of Cape Florida and affords good shelter in any wind; it is seldom used except by small local craft. The **Cape Florida Swash Channel** is well marked by buoys and has the better water; its entrance is about 3¼ miles **NW.** by **N.** from Fowey Rocks Lighthouse.

FLORIDA KEYS AND REEFS.‡

The Florida Keys consist of a remarkable chain of islands, beginning with **Virginia Key**, in about latitude **25° 45′ N.**, longitude **80° 09′ W.**, and extending in a circular sweep to **Marquesas Keys**, in latitude **24° 33′ N.**, longitude **82° 10′ W.**, a distance of nearly 145 miles. For a distance of nearly 100 miles they skirt the southeast coast of the Florida peninsula, from which they are separated by shallow bodies of water known as Key Biscayne Bay, Card Sound, **Barnes Sound**, and **Florida Bay**, which are connected in the order named. Key Biscayne Bay has a depth of 9 to 10 feet for a great part of its length; the other bodies of water are shallow, full of small keys and shoals, and of no commercial importance. Westward of Florida Bay the Florida Keys separate the Straits of Florida from the Gulf of Mexico.

The most important of the keys named in order from north to southward and westward are: Virginia Key, Key Biscayne, Key Largo, Long Island, Upper and Lower Matecumbe Keys, Long, Conch, Duck, Crawl, Fat Deer, Vaca, Bahia Honda, Big Pine, Torch, Summerland, Cudjoe, Sugar Loaf, Saddle Bunch, and Boca

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*Shown on chart **165**, scale $\frac{1}{80,000}$, price $0.50.

†Shown on charts **165, 166**, scale $\frac{1}{80,000}$, price of each $0.50.

‡Shown on chart **15**, scale $\frac{1}{400,000}$, price $0.50; and in parts on charts **166, 167, 168, 169, 170**, scale $\frac{1}{80,000}$, price of each $0.50.

Chica Keys, Key West, Boca Grande Key, and Marquesas Keys. Those named border on the Hawk Channel, which separates them from the Florida Reefs (see description), and there are others with names and many small ones without names. No detailed description of the keys can be given, and none is necessary; they are mostly of coral formation, all are low and for the most part covered with a dense growth of mangroves, though some are well wooded with pine, and on a few are groves of cocoanut trees. A number of the keys are inhabited, but the only place of importance is Key West. (See description.)

There are several channels between the keys, through which a depth of 5 to 7 feet can be taken from the Hawk Channel to the Bay of Florida and Gulf of Mexico. These channels are only used by the small craft which trade among the keys, and should not be attempted by a stranger without a pilot.

Florida Reefs.—The Florida Keys are skirted on the side next to the straits throughout their whole extent by the Florida Reefs, a chain of dangerous reefs and shoals lying at an average distance of about 5 miles from the line of keys. Between the chain of reefs and keys there is a passage called the Hawk Channel. The reefs are more dangerous from the fact that they are not marked by breakers in smooth weather and few show above water. On the outer edge of and between the reefs the water shoals very abruptly.

In approaching the reefs from seaward warning of their proximity will usually be given by a difference in the color of the water, which will change from deep blue to light green; too much dependence must not, however, be placed upon this warning. In clear weather the lighthouses and beacons make navigation along the reefs easy; in thick weather the lead must be relied upon for safety. Soundings in 100 fathoms will assure the navigator of being within about 5 miles of the reefs, and great caution should be used in approaching them closer. Fogs, however, are not frequent in this locality.

The lighthouses along the reefs are fully described in the table of lights, pages 24–27.

The day marks are described in the "Buoy and Beacon List" of the Seventh Lighthouse District (see note on pages 12, 13).

The most important passages between the reefs and anchorages near them are described elsewhere in this volume.

THE HAWK CHANNEL.*

The navigable passage inside the Florida Reefs from Cape Florida to Key West is known as the Hawk Channel. It varies in depth from 11 feet to 5¾ fathoms and is ¼ of a mile wide at its narrowest part.

Vessels drawing 10 feet, bound southward and westward, may use this channel with great advantage, avoiding entirely the adverse current of the Gulf Stream and finding comparatively smooth water in all winds. Steamers, or sailing vessels with a leading wind, may run the courses through this channel without difficulty. Sailing vessels drawing more than 7 feet are advised not to try to *beat* through without a pilot. Pilots can generally be found by anchoring at Cape Florida and sending a boat up to Miami on Key Biscayne Bay, or they may be had at Key West, and from the small vessels which will sometimes be found cruising among the reefs.

Vessels using this channel must anchor at night. This they can do almost anywhere where soft bottom is found. (See anchorages along the Hawk Channel, pages 118 to 120.) Where the bottom is hard the holding ground is very bad, and vessels are liable to drag if it blows fresh.

The most important keys and reefs have been named (see Florida Keys and Reefs). A detailed description of the dangers is impracticable as well as useless. The navigator must rely almost wholly upon the aids to navigation, paying particular attention to the beacons and buoys; there are also a number of spindles and beacons which are intended for the guidance of vessels skirting along outside the reefs.

SAILING DIRECTIONS, HAWK CHANNEL—FROM CAPE FLORIDA TO KEY WEST.

While in from 6 to 8 fathoms of water, get Cape Florida old lighthouse tower, on the south end of Key Biscayne, to bear **SSW. ¼ W.**, and steer for it (leaving beacon "W," which marks the north end of the Florida reefs, about ⅝ mile on the port hand) until beacon "W" bears **E.**, distant ⅝ mile, and the south end of Virginia Key bears **SW.** by **W. ½ W.**, distant 2 miles. These cross bearings are in 4¼ fathoms of water. From this

* Shown in part on charts 166, 167, 168, 169, scale $\frac{1}{80,000}$, price of each $0.50.

position vessels entering the Hawk Channel should be guided by the tabulated directions following:*

From—	Side on which to leave it.	Distance at which to pass it.	Depth of water.	Course to make good.	Distance from aid to aid.	Least water between aids.	To—
			Feet.		*Miles.*	*Feet.*	
North end of Florida Reefs Beacon W.	Port	⅝ mile	14	South	3⅛	21	First P. S. buoy leading to Hawk Channel.
First P. S. Buoy leading to Hawk Channel.	Either	Close-to	21	South	3⅜	18	Second P. S. Bell Buoy leading to Hawk Channel.
Second P. S. Bell Buoy leading to Hawk Channel.	Either	Close-to	21	South	2¾	17	Fowey Rocks Beacon V.
Fowey Rocks Beacon V	Port	450 feet	14	S. by W. ¼ W	2½	14	Ragged Keys Buoy (red, No. 2).
Ragged Keys Buoy (red, No. 2)	Starboard	Close-to	17	S. by W. ¼ W	2½	17	Bowles Bank Beacon Light.
Bowles Bank Beacon Light	Port	300 feet	15	S. ¾ E	¾	14	Bache Shoal Buoy (black, No. 3).
Bache Shoal Buoy (black, No. 3)	Port	Close-to	15	SW. by S	1½	14	Beacon off Bache Shoal and south of Bowles Bank.
Beacon off Bache Shoal and south of Bowles Bank.	Either	Close-to	15	S. ¾ W	2½	15	Margot Fish Shoal Buoy (red, No. 4) and Day Beacon.
Margot Fish Shoal Buoy (red, No. 4) and Day Beacon.	Starboard	750 feet	13	S. ¾ W	1⅜	14	P. S. buoy off Elliott Key.
P. S. Buoy off Elliott Key	Either	Close-to	15	S. by W. ⅝ W	2½	14	Cæsar Creek Buoy (red, No. 6).
Cæsar Creek Buoy (red, No. 6)	Starboard	600 feet	12	S. by W. ⅝ W	2½	14	Old Rhodes Bank Buoy (red, No. 8) and Beacon Light.‖
Old Rhodes Bank Buoy (red, No. 8) and Beacon Light.‖	Starboard	600 feet	12	SSW. ⅞ W	4¾	14	P. S. buoy off Key Largo.
P. S. Buoy off Key Largo	Either	Close-to	13	SSW. ⅞ W	4⅜	11	P. S. buoy off Basin Hill.†
P. S. Buoy off Basin Hill	Either	Close-to	11	SSW. ½ W	5	11	Grecian Shoals Buoy (black, No. 5).
Grecian Shoals Buoy (black, No. 5)	Port	⅜ mile	15	SW. ¾ S	5	12	Mosquito Bank Buoy (black, No. 7)‡.
Mosquito Bank Buoy (black, No. 7)	Port	¼ mile	12	SW. ¾ S	5¼	11	Triangle Shoal Buoy (black, No. 9) and Tavernier Key Beacon.
Triangle Shoal Buoy (black, No. 9) and Tavernier Key Beacon.	Port	300 feet	17	SW. ⅞ S	6¾	12	Hen and Chickens Beacon Light (red), marked "H. & C."
Hen and Chickens Beacon Light (red), marked "H. & C."	Starboard	300 feet	16	SW. ⅞ W	6½	12	Indian Key Beacon (red).
Indian Key Beacon (red)	Starboard	300 yards	14	SW. ⅞ W	9¼	14	Long Key Shoal Beacon Light.‖
Long Key Shoal Beacon Light‖	Starboard	¾ mile	14	WSW. ⅛ W	5⅜	15	P. S. buoy off Duck Key.
P. S. Buoy off Duck Key	Starboard	Close-to	22	SW. by W. ¼ W	3½	14	East Turtle Shoal Beacon Light (black), marked "E. T."
East Turtle Shoal Beacon Light (black), marked "E. T."	Port	¼ mile	18	SW. by W. ¼ W	2½	14	West Turtle Shoal Buoy (H. S.).
West Turtle Shoal Buoy (H. S.)	Port	⅝ mile	16	SW. by W. ½ W	3	24	Jacobs Harbor Heads Beacon (red).
Jacobs Harbor Heads Beacon (red)	Starboard	400 yards	21	WSW. ½ W	2⅞	24	East Washerwoman Shoal Beacon Light (black), marked "E. W."
East Washerwoman Shoal Beacon Light (black), marked "E. W."	Port	¼ mile	15	WSW. ½ W	4	20	P. S. Buoy off Pigeon Key.
P. S. Buoy off Pigeon Key	Either	Close-to	28	WSW. ½ W	7	25	P. S. Buoy off Bahia Honda.
P. S. Buoy off Bahia Honda	Either	Close-to	26	WSW. ¾ W	10¼	20	Loggerhead Key Beacon Light.‖
Loggerhead Key Beacon Light‖	Starboard	½ mile	20	WSW. ¾ W	6¼	15	Four-Foot Shoal Beacon Light (black), marked "D. H."
Four-Foot Shoal Beacon Light (black), marked "D. H."	Port	¾ mile	24	WSW. ¾ W	1½	17	Washerwoman Shoal Buoy (black, No. 17).
Washerwoman Shoal Buoy (black, No. 17).	Port	⅜ mile	18	WSW. ¾ W	1¾	16	Pelican Key Beacon Light.‖
Pelican Key Beacon Light‖	Port	600 feet	12	WSW. ¾ W	8¾	18	Hawk Channel Turn Buoy (P. S.).
Hawk Channel Turn Buoy (P. S.)	Either	Close-to	33	W. by N	2⅛	30	Whitehead Spit Buoy (red, No. 6.).
Whitehead Spit Buoy (red, No. 6)	Starboard	300 feet	30	North	¾	27	South End Middle Ground Buoy (black, No. 11).
South End Middle Ground Buoy (black. No. 11).	Port	750 feet	17	NNE	¾	25	Wharves at Key West.

* Where changes in the course are given in these directions they should be made with the proper beacon or buoy abeam, on the side and at the distance directed. Vessels of less than 10 feet draft may, if necessary, pass close to any buoy in the channel. There are no rocks in this channel, and anchorages are good and numerous (see anchorages).

† Basin Hill Beacon Light should be left ½ mile on port hand.

‡ Mosquito Bank Beacon Light should be left ⅜ mile on port hand.

‖ Not lighted September 20, 1900.

HARBORS AND ANCHORAGES ALONG THE FLORIDA REEFS AND HAWK CHANNEL.*

The keys and reefs have been described. A detailed description of the dangers will not be attempted, as none could be given that would be of particular advantage to the navigator. He must rely almost wholly on the aids to navigation and on the lead.

Sailing directions for passing outside the Reefs are given on pages 41–43, and for the Hawk Channel on this page; the anchorages, with brief directions for making them, will be given, commencing near Cape Florida and going to the southward and westward.

Tides.—The mean rise and fall of tides is from 2 feet at Fowey Rocks to a little less than 1½ feet at Key West.

* In treating of these anchorages sailing directions are given only for the most important. There are many places where vessels using the Hawk Channel may anchor, and in the brief treatment of them names have been used with an idea of designating the locality, which may be easily recognized by reference to the Coast and Geodetic Survey Charts mentioned in the footnote on page 114.

FOWEY ROCKS ANCHORAGE.*

This anchorage is about 1 mile westward of Fowey Rocks, is fairly well sheltered, and affords anchorage for vessels of about 14 feet draft. There are spots of soft bottom in it, and a vessel anchored on one of these may ride out a heavy gale in perfect safety.

GENERAL DIRECTIONS, FOWEY ROCKS ANCHORAGE.

If drawing more than 12 feet, follow the directions for entering Hawk Channel (page 114). From a position $\frac{5}{8}$ mile westward of beacon "W," steer **S.**; this course made good for $9\frac{1}{4}$ miles should lead close to and past a white and black perpendicularly striped can buoy and a white and black perpendicularly striped bell buoy and so as to leave Fowey Rocks beacon "V" about 350 yards on the port hand. Anchor soon after passing this beacon, with Fowey Rocks Lighthouse (see table, page 24) bearing **E.** $\frac{1}{2}$ **N.**, distant a little over $1\frac{1}{4}$ miles.

If drawing less than 12 feet, and with a smooth sea, a vessel may stand in anywhere northward of Fowey Rocks Lighthouse by giving it a berth of 1 mile. After passing Fowey Rocks beacon "V," anchor in from 3 to 5 fathoms water, soft bottom.

Or, when $2\frac{1}{2}$ miles northward of Fowey Rocks Lighthouse leave the black can buoy 200 yards on the port hand and steer **SW.** $\frac{1}{2}$ **W.** until the lighthouse bears on the port beam; then steer **S.** and anchor when beacon "V" is abaft the port beam, as directed in the first paragraph.

CAPE FLORIDA ANCHORAGE AND MIAMI.*

There is a very good anchorage for vessels of 8 feet draft just inside Cape Florida, and with local knowledge a draft of 11 feet may be taken to the anchorage and through Key Biscayne Bay to the town of Miami, in the channel which has been improved by the Florida East Coast Railway Company. The steamers of this company drawing from 10 to $11\frac{1}{2}$ feet run between Miami and Nassau, but when drawing over 10 feet they take advantage of high water to avoid grounding.

There are two buoyed channels leading from the Hawk Channel to the anchorage—the **Cape Florida Channel** and the **Cape Florida Swash Channel**; the latter is the one improved by the railway company and is marked by a number of buoys placed by the company for the guidance of its vessels and a number of buoys and a beacon placed by the Government.

No stranger of over 8 feet draft should attempt to enter without a pilot. As no pilots cruise in this vicinity, a pilot at Miami will have to be notified to be on the lookout for the vessel when she is expected to arrive or a boat be sent to Miami for one.

The following directions are good for a draft of less than 8 feet: when entering by the Cape Florida Swash Channel care must be taken not to be confused by the number of private buoys which mark the channel followed by the steamers running to Miami.

The average rise and fall of tides is about 1 foot.

GENERAL DIRECTIONS, CAPE FLORIDA AND MIAMI ANCHORAGES.

To enter by the Cape Florida Channel.—Follow the directions given for entering Hawk Channel (page 114) until past Fowey Rocks beacon "V," when steer **W.** $\frac{1}{4}$ **S.** (keeping Fowey Rocks Lighthouse bearing **E.** $\frac{1}{4}$ **N.**) for Soldier Key buoy (black and white perpendicular stripes), which pass close-to on either hand. Continue the same course until up to Soldier Key beacon (red), which leave on the starboard hand, and then change course to **N.** $\frac{1}{8}$ **E.** On this course Sand Bore buoy (black and white perpendicular stripes) should be passed close-to on either hand and Cape Florida Shoals buoy (Red, No. 2) close-to on the starboard hand. When up to this buoy steer **NW.** $\frac{1}{4}$ **N.**, being careful not to close the white sand beach near the old tower on Cape Florida with the farthest green mangrove point to the **NW.** (on Key Biscayne), but gradually open it until the old tower is abeam and distant about $\frac{1}{4}$ mile. Here anchor in 16 or 18 feet of water; or, stand on a little farther toward Point of Middle Ground buoy (red, No. 4) and then anchor.

* Shown on Chart 166, scale $\frac{1}{80,000}$, price $0.50.

Or, to keep on for Miami River anchorage, leave Point of Middle Ground buoy close-to on the starboard hand and then steer about **W.** ½ **S.** for South Bank buoy (black, No. 5), which will be visible. Leave it about 30 yards distant on the port hand and then steer **W.** for Bar of Key Biscayne Bay beacon (red), which must be left close-to on the starboard hand. From the beacon steer **NW.** by **W.** for about 1 mile, and then stand **N.** ½ **E.** for 4½ miles, when anchor in 10 feet of water with the mouth of Miami River bearing about **N.** by **W.** ½ **W.**

To enter by the Cape Florida Swash Channel.—When outside the reefs bring Fowey Rocks Lighthouse to bear **S.** ¾ **W.** distant about 2½ miles, the Biscayne Bay Sea buoy (can, black, No. 1) should then be about ⅜ mile distant; steer for this buoy, leave it on the port hand and steer about **WNW.** ¾ **W.** for Cape Florida Shoals beacon (lighted, painted red). Leave red buoy No. 2 at the entrance to the channel on the starboard hand and steer northwestward, following the buoys and so as to leave the beacon and the red and black horizontally striped buoy on the starboard hand. Continue northwestward, following the buoys, to Cape Florida Shoals buoy (nun, red, No. 2), which should be left on the starboard hand. From the latter buoy follow the directions as given for entering by the Cape Florida Channel.

Or, if in the Hawk Channel, when near the bell buoy lying 3⅕ miles **NNW.** from Fowey Rocks Lighthouse, steer about **W.** for Cape Florida Shoals Beacon on the north side of the entrance to Cape Florida Swash Channel and follow the directions in the preceding paragraph.

Remarks.—When past red buoy No. 2, on Cape Florida shoals, and standing in for Cape Florida anchorage, or through the buoyed channel into Key Biscayne Bay, the shoals on both sides of the channel will be distinctly seen.

Pilots for Key Biscayne Bay and the Hawk Channel may be obtained by sending a boat to Miami.

LEGARE ANCHORAGE.*

This anchorage, just to the westward of Triumph Reef and 7 miles southwestward of Fowey Rocks Lighthouse, is about 1¾ miles in length and from ½ to 1 mile in width.

The bottom is mostly hard, but there are some soft spots on which vessels may anchor and ride out a gale in safety. The soft spots lie about **W.** ½ **N.** from Triumph Reef Beacon, distant 1¼ miles.

The anchorage is good for vessels of 18 feet draft, and may be entered from either outside or from the Hawk Channel. It is good anchorage for vessels running down outside the reefs, but as beacon "**O**" is the only guide, it must be entered with great caution.

GENERAL DIRECTIONS, LEGARE ANCHORAGE.

The following directions are good for a draft of 18 feet, with a smooth sea, when entering from the Straits of Florida; but strangers seeking shelter are advised to enter Turtle Harbor, which is 15 miles southwestward of Legare Anchorage, and is well marked by buoys. Both anchorages can only be entered by strangers in the daytime; the only aid to be depended on for making Legare Anchorage is beacon "**O**" on Triumph Reef.

I. ***To enter from the Straits of Florida.***—Coming from northward a sharp lookout should be kept for beacon "**O**"; when a **W.** course will lead so as to pass 1¼ miles northward of the beacon steer **W.**, and when the beacon bears **S.** ⅛ **E.** and is distant about 1¼ miles steer **SW.** ¾ **W.** and anchor when the beacon bears between **SE.** by **E.** and **ESE.** ½ **E.** in 4 to 5 fathoms water, soft bottom.

Coming from southward when beacon "**O**" is made, bring it to bear **N.** by **W.** and steer for it on this bearing until the beacon is a little over 1 mile distant on the bearing; then steer **NW.** by **N.** (leaving the beacon ⅜ mile on the starboard hand when abeam) until the beacon bears **ESE.** Then haul more westward until the vessel heads about **NW.** by **W.**; steady on this course until the beacon is distant about 1⅛ miles and bears between **ESE.** ½ **E.** and **SE.** by **E.** and anchor in 4 to 5 fathoms water, soft bottom.

*Shown on charts **166**, scale $\frac{1}{80,000}$, price $0.50; **465**, scale $\frac{1}{20,000}$, price $0.15.

II. *To enter from the Hawk Channel.*—From Fowey Rocks beacon "**V**" make good a **S.** ¼ **W.** course for 7 miles; beacon "**O**" should then bear about **ESE.** distant 1 mile. Then steer **SW.** ½ **S.** for ¼ mile and anchor in 4 to 5 fathoms water, soft bottom.

Or, from Bache Shoal buoy (black, No. 3) steer **E.** for ¾ mile, then steer **S.** ½ **W.** until beacon "**O**" bears between **ESE.** and **E.** ½ **N.** Anchor in 4 to 5 fathoms water, soft bottom.

ANCHORAGES ALONG THE HAWK CHANNEL.

Bowles Bank Anchorage.*—This is a good anchorage in all winds, with 14 to 16 feet of water and mostly soft bottom. The anchorage is between Bache Shoal buoy (black, No. 3) and the white and black perpendicularly striped beacon lying east of the north end of Elliot Key, and where the bottom is soft.

Cæsar Creek Bank Anchorage.*—This has 10 to 12 feet of water and is good in all winds. To make the anchorage, when anywhere between Margot Fish Shoal beacon and Cæsar Creek Bank bouy (red, No. 6), stand westward until the water is shoaled to 10 or 12 feet, and anchor in soft bottom.

Key Largo Anchorage.*—Northward and westward of the white and black perpendicularly striped buoy off the north end of Key Largo, with Carysfort Reef Lighthouse bearing about **SSE.** ½ **E.**, soft bottom in 14 feet of water will be found, and vessels may here anchor in safety without regard to the direction of the wind.

TURTLE HARBOR.*

This is an excellent well sheltered anchorage between the reefs lying northwestward of Carysfort Reef Lighthouse. The approach and entrance from the Straits of Florida is marked by buoys, and in smooth water a vessel of 21 feet draft should have no trouble in entering. The depth at the approach ranges from 4 to 6 fathoms and at the anchorage from 4 to 4½ fathoms. By following the buoys from Turtle Harbor Sea buoy a depth of 28 feet can be taken to the harbor.

Tides.—The mean rise and fall of tides is about 1½ feet. The flood sets northwestward and the ebb southeastward.

SAILING DIRECTIONS, TURTLE HARBOR.

The following directions are good for a draft of 21 feet in the daytime, when the buoys can be seen. No stranger should attempt to enter at night.

1. *Entering from the Northward.*—Standing along outside the reefs, as directed in section 5, page 41, when on the **S.** by **W.** ¾ **W.** course Turtle Harbor Sea buoy is abeam, steer for the buoy and leave it about 100 yards on either hand and then steer **W.** for the entrance buoy (nun, white and black perpendicular stripes). Leave this buoy close-to on either hand and steer **SW. Southerly** for black can buoy No. 1; leave this buoy 50 yards on the port hand and steer **SSW.** ½ **W.**, leaving the two red nun buoys about 150 yards on the starboard hand and black can buoy No. 3 on the port hand. Continue on until up to the anchorage buoy (nun, white and black perpendicular stripes) near which come to anchor in 4 to 4½ fathoms of water, soft bottom.

Remarks.—When standing from the Sea buoy to the Entrance buoy, Turtle Reef beacon "**K**" will be seen on the port bow and is left on the port hand. Farther westward Turtle Harbor beacon "+" will be seen; this is left well on the starboard hand when entering. Both of these beacons are iron shafts; the former has a red vane and white letter, and the latter a black cage with red cross on top. The best anchorage is within a radius of ⅜ mile from the anchorage buoy.

1 A. *Entering from the Southward.*—Pass from ½ to 1 mile outside of Carysfort Reef Lighthouse and steer **NNE.** about 4¾ miles until up to Turtle Harbor Sea buoy; leave this buoy close-to on either hand, then steer **W.** and continue as directed in section 1 preceding. (See also the remarks under section 1 preceding.)

Vessels of less than 21 feet draft can, as soon as Turtle Reef beacon is made, steer for the beacon on any bearing between **SW.** and **NW.**, and when the Entrance buoy (nun, white and black perpendicular stripes) is made steer for it, taking care to leave Turtle Reef beacon at least ¼ mile on the port hand. From the entrance buoy follow the directions in section 1 preceding, and see also the remarks under the section.

*Shown on chart 166, scale $\frac{1}{80,000}$, price $0.50.

ANCHORAGES ALONG THE HAWK CHANNEL.

Tavanier Key Anchorage.*—Good anchorage with soft bottom, in 16 to 20 feet of water, will be found with Tavanier Key bearing between **W.** and **NW.**, distant from ¾ to 1 mile.

Long Key Anchorage.†—Soft bottom, in from 15 to 20 feet of water, will be found ¾ mile to the westward of Long Key Shoal Beacon Light, but vessels anchoring here will be exposed to southerly winds.

Turtle Shoal Anchorage.†—Fair anchorage will be found in 4½ fathoms, soft bottom, ½ mile **NW.** by **W.** ¼ **W.** from East Turtle Shoal lighted beacon, and also ½ mile **NW.** from West Turtle Shoal buoy (red and black horizontal stripes), in from 4 to 6 fathoms.

Knights Key Anchorage.†—This is a good anchorage 3¾ miles **NNW.** from Sombrero Key Lighthouse, but it is somewhat exposed to southwesterly winds. To make this anchorage, bring Sombrero Key Lighthouse to bear **S.** by **E.** ¾ **E.** and steer **N.** by **W.** ¾ **W.** until Knights Key bears about **NE.**; anchor in about 3 fathoms water, sticky bottom. Pigeon Key will bear about **WNW.** from the anchorage. The westerly edge of a red sector in Sombrero Key Lighthouse leads to the anchorage.

Two channels with 7 feet of water lead from this anchorage into the Bay of Florida; they are known as the **Knights Key Channel** and **Moser Channel.** Vessels passing through must get a pilot or be guided by the chart.

BAHIA HONDA HARBOR.†

This is one of the best anchorages to be found among the Florida Reefs and Keys. It is nearly 30 miles eastward of Key West and affords fair shelter for vessels of 18 feet draft, but inside it is a safe anchorage in a hurricane for vessels up to 13 feet draft. The entrance, which is 9½ miles **W.** ¼ **N.** from Sombrero Key Lighthouse and 14¼ miles **NE.** by **E.** ¼ **E.** from American Shoal Lighthouse, makes northward between **Bahia Honda** on the east and the **West Summerland Keys** on the west; it can be approached both from the Hawk Channel and from outside the reefs with a depth of 4 fathoms. Vessels of 18 feet draft can anchor in the channel, with a depth of 5 fathoms, just westward of the western end of Bahia Honda; here they are sheltered from the sea, but the bottom is hard and not good holding ground. Farther to the northward and well inside of Bahia Honda and West Summerland Keys the bottom is soft and good holding ground, but the depth ranges from 14 to 16 feet. A beacon light and buoys mark the principal shoals when entering and one buoy marks the inside anchorage.

A channel with a least depth of 5 feet leads from the head of Bahia Honda Harbor to the Bay of Florida; it is known as the **Big Spanish Key Channel.**

Tides.—The mean rise and fall of tides at the entrance is 1½ feet. High water occurs 1 hour 16 minutes before high water at Key West and low water 37 minutes before low water at Key West.

SAILING DIRECTIONS, BAHIA HONDA HARBOR.

The following directions are good, in a smooth sea, for vessels of 18 feet draft to the outer anchorage and for vessels of 13 feet to the inner anchorage. The red sectors of Sombrero Key and American Shoal lights intersect at the entrance of the harbor, and a beacon light marks the end of the shoal on the east side of the entrance.

1. ***Approaching and Entering from the Eastward.***—Passing outside the reefs bring Sombrero Key Lighthouse to bear **N.** by **W.** distant 1 mile, then steer **W.** ¾ **N.** When Bahia Honda Beacon Light (painted red) is made steer so as to pass 300 yards southward of it, and when up to the beacon leave it 300 yards on the starboard hand, and steer **N.** by **W.** ¼ **W.** When the small rocky patch off the west end of Bahia Honda, and which is left on the starboard beam, bears **SE.** anchor in about 5 fathoms of water.

If bound into the inner harbor continue on the **N.** by **W.** ¼ **W.** course; leave black can buoy No. 1 on the port hand and stand for the Anchorage buoy (nun, white and black perpendicular stripes) on the same course. Anchor ¼ mile southward of this buoy in 16 feet water, soft bottom.

A vessel standing through the Hawk Channel, and when up to the perpendicularly striped buoy off Bahia Honda, should steer about **NW.** and leave the beacon light about 300 yards on the starboard hand, then steer **N.** by **W.** ¼ **W.** and follow the directions in the preceding paragraph.

*Shown on chart **167**, scale $\frac{1}{80,000}$, price $0.50. † Shown on chart **168**, scale $\frac{1}{80,000}$, price $0.50.

Remarks.—In heavy gales, when the sea is breaking on the reefs westward of Sombrero Key Lighthouse, the best water for crossing the reefs (4½ fathoms) will be found when heading for Bahia Honda Beacon Light on a **N.** by **W.** ½ **W.** course.

1 A. ***Approaching and Entering from the Westward.***—Bring American Shoal Lighthouse to bear **NNW.** distant 1 mile and steer **ENE.** ½ **E.** for 2⅞ miles; then steer **N.** ½ **W.** with the eastern end of Loggerhead Key ahead. When American Shoal Lighthouse bears **SW.** by **W.** ¼ **W.** steer **NE.** by **E.** ¼ **E.** keeping the lighthouse on the bearing and when Looe Key beacon "**6**" is on the starboard beam distant 1¾ miles, and Loggerhead Beacon Light bears about **NW.** by **W.** ½ **W.**, distant 2⅜ miles, steer **ENE.** ¼ **E.** for nearly 8 miles. Bahia Honda Beacon Light will then bear **N.** ½ **E.** and a **N.** course should be steered so as to leave this beacon 300 yards on the starboard hand. When abreast of the beacon steer **N.** by **W.** ¼ **W.** and anchor about ⅝ mile inside the beacon in 5 fathoms water; or continue, and follow the directions in the second paragraph in section 1 preceding.

Or, with American Shoal Lighthouse bearing **NNW.**, distant 1 mile, steer **ESE.** ½ **E.** for 14 miles; then steer **N.** by **W.** ½ **W.** for Bahia Honda Beacon Light, leaving the perpendicularly striped buoy ½ mile on the starboard hand; leave the beacon light 300 yards on the starboard hand and steer **N.** by **W.** ¼ **W.** Anchor as directed in the preceding paragraph.

A vessel standing through the Hawk Channel, when Bahia Honda Beacon Light is made steer for it on any bearing between **W.** ½ **S.** and **NE.** by **E.** ¼ **E.**; leave it 300 yards on the starboard hand and steer **N.** by **W.** ¼ **W.** Anchor as directed in the second paragraph of section 1.

ANCHORAGES ALONG THE HAWK CHANNEL.

Loggerhead Key Anchorage.*—About 1 mile eastward of Loggerhead Key and 1 mile northward of Loggerhead Key Beacon Light there is a fair anchorage in 15 feet water, soft bottom. To make this anchorage pass ¼ or ½ mile eastward of Loggerhead Key Beacon Light and anchor within 1 mile of it, having it bearing anywhere between **S.** and **SW.**

West Washerwoman Anchorage.*—Good anchorage can be found in 3¾ fathoms about 1½ miles **NE.** by **N.** from West Washerwoman Shoal buoy (black, No. 17).

Saddle Hill Anchorage.*—Soft bottom will be found in 4¼ fathoms water 1 mile **W.** from Pelican Key Beacon Light. Westward of this there is no good anchorage until up to Key West.

KEY WEST HARBOR.†

This harbor is large and commodious, and one of the best anchorages for large vessels south of Chesapeake Bay. It lies northward of a broken line of the Florida Reefs in latitude **24° 33′ N.** and longitude **81° 49′ 30″ W.** and is 16 miles westward of American Shoal Lighthouse and about 90 miles **N.** by **E.** ½ **E.** from Habana. On the eastern side of the harbor is the city of **Key West**, which has a population of about 20,000 and is of considerable commercial importance. It is the only city of any size on the west and north shores of the Straits of Florida, and has steamship communication with New York, Habana, Tampa, New Orleans, and Galveston. A large number of steamers and small sailing vessels enter and clear from the port, over half of which are from or for foreign ports. The greatest draft of vessels coming to the port is 25 feet and the average draft about 14 feet. Key West Harbor, through its Northwest Channel, affords a short route from the Straits of Florida into the Gulf of Mexico for vessels of less than 11 feet draft.

Prominent features.—When standing along about 6 miles southward of the Florida Keys, as the entrances from the southward are approached **Key West Lighthouse** (see table, page 26) will be seen near the western end of Key West Island, and **Fort Taylor**, a brick casemated structure, will show prominently a little westward of the island. **Sand Key Lighthouse** (see table, page 26) will be seen about 7 miles southwestward from Key West Lighthouse and the former will sometimes have the appearance of a sail. There are two brick Martello towers on the south side of Key West Island eastward of the lighthouse; these towers can be seen from some distance outside of the reefs. Eastern Triangle Beacon (painted red, showing a light) is midway between the Entrance buoy of the Main Ship Channel and Key West Lighthouse, and can be readily distinguished from outside the reefs. Northwestward of the harbor, and marking the entrance to the Northwest Channel, is **Northwest Passage Lighthouse** (see table, page 26). On the western end of Key West Island the **United States Naval Storehouse** and the **Lazaretto**, the latter a large yellow building, will show conspicuously.

*Shown on chart **169**, scale $\frac{1}{80,000}$, price $0.50. †Shown on charts **169**, scale $\frac{1}{80,000}$, price $0.50; **469**, scale $\frac{1}{50,000}$, price $0.25.

Channels.—There are eight different channels or approaches to the harbor, leading between the reefs and coral banks which surround it. These channels are easy to follow in a sailing vessel in the daytime with a leading wind, but it is not safe for a stranger of more than 14 feet draft to attempt to beat into the harbor.

1. **Southeast Channel** is good for a least depth of 25 feet and is marked by several buoys and at night by a red sector in Key West Light, but the channel is narrow and should not be attempted by a sailing vessel of over 14 feet draft except with a leading wind.

2. **Point of Reef Channel** is good for a least depth of 19 feet and leads from a point ¾ mile westward of Beacon 5, directly for Key West Lighthouse. This channel is not marked, and as there are spots with 14 feet of water over them lying near the channel it is not recommended for vessels over that draft.

3. **Main Ship Channel** is good for a least depth of 26 feet; it is quite narrow in places but well marked by buoys and a beacon and at night by a red sector in Key West Light. This is the channel commonly used by the deeper draft steamers. A stranger of over 15 feet draft should not attempt to enter by this channel at night.

4. **Rock Key Channel** leads between Sand Key Lighthouse and Rock Key; the channel is not marked and is not safe for vessels of over 15 feet draft.

5. **Sand Key Channel** leads between Sand Key Lighthouse and Western Dry Rocks; it is good in the daytime for vessels of about 18 feet draft. Vessels of less than 14 feet draft can pass through this channel on a straight course for Key West Lighthouse. A stranger should not attempt this channel at night.

6. **Southwest Channel** is convenient for vessels approaching from southward and westward; it has a least depth of 30 feet if closely followed and is marked by several buoys. Vessels of less than 17 feet draft can make one straight course nearly to the anchorage on a bearing of Key West Lighthouse in the daytime and by standing on the edge of a red sector of that light at night. Vessels of a greater draft than 17 feet should only enter in the daytime, when the buoys can be seen, and, if sailing vessels, they should have a leading wind.

7. **West Channel** is broad and clear and if marked by buoys would be good for a depth of 30 feet, but it is not now recommended for vessels of over 17 feet draft.

8. **Northwest Channel** is being improved by the United States Government and now has a depth of 11 feet. This channel affords a short cut from Key West Harbor to the Gulf of Mexico and is well marked by Northwest Passage Lighthouse and several buoys and a beacon.

Anchorages.—The best anchorage is in the Inner or **Man of War Harbor**, where the depth is 4 to 4½ fathoms; this anchorage is northward of the city between coral banks, which prevent a heavy sea. Vessels can anchor anywhere off the city northward of Fort Taylor, or in the entrance to the Northwest Channel abreast of the city in from 3½ to 5 fathoms of water, taking care, however, not to get too close to the reefs which in some places rise abruptly at the edge of the channels. The outer anchorage, about 1¼ miles southward and eastward from Fort Taylor, has depths of 4½ to 5½ fathoms and is somewhat exposed, but is safe for vessels with good ground tackle.

Quarantine.—The boarding station is near Fort Taylor; no vessel is permitted to pass above this before obtaining pratique. At night vessels must anchor outside Fort Taylor; in the daytime they may heave-to until boarded. The quarantine anchorage is in Man-of-War Harbor northward of Fleming Key. (See also the quarantine regulations in Appendix I, and National Quarantines in Appendix III.)

Pilots can always be had by making signal while outside the reefs. Pilot boats are usually cruising outside and a good lookout is kept for approaching vessels. Pilotage is compulsory for certain vessels. (See pilot laws, regulations, and rates in Appendix I.) Pilots for the Hawk Channel can be had at Key West.

Wharves.—The depth of water at the wharves ranges from 10 to 24 feet, according to locality.

Supplies.—A large supply of anthracite and bituminous coal is always kept on hand. Steamers go alongside the wharves and coal is put on board in wheelbarrows. Water can be obtained at the wharves through pipe and hose from cisterns. Provisions and ship chandler's stores can be obtained in the city.

Repairs.—There is a small floating sectional dock. Repairs to the hulls of wooden vessels can be made, but there are no facilities for repairing iron or steel vessels or the machinery of steamers except of the lighest description.

Storm-Warning Displays of the **United States Weather Bureau** are made so as to be visible to the shipping in the harbor. (See Appendix II.)

United States Marine-Hospital Service.—The Marine Hospital or Lazaretto is open to foreign as well as American seamen, but the former must pay at a rate fixed annually by the Secretary of the Treasury. (See Appendix IV.)

Tides.—The mean rise and fall of tides is 1.2 feet (see also the table on page 10).

Currents.—The set and velocity of the currents depend much on the Gulf Stream and the prevailing winds, and vary so frequently that no fixed rule can be deduced from observations. Occasionally the ebb and flow run nearly the whole 12 hours. Sometimes the current of a neap tide runs with great velocity while that of a spring tide is scarcely perceptible. The following statements will give an idea of what may be expected at the localities mentioned: At entrance to Main Channel, flood current **N.** by **W.** and ebb **SE.** by **S.**; at entrance to Southeast Channel flood current **NW.** and ebb **WSW.**; at Triangle buoys, flood current **N.** and ebb **SE.**; at Whitehead Spit buoy, flood current **NW.** and ebb **S.** by **E.**; Outer Harbor, flood current **NNW.** and ebb **SSW.**; Inner Harbor, flood current **NNE.** and ebb **SW.** by **S.**

Winds.—The prevailing winds are easterly, the strongest **N.** in winter and easterly during the hurricane months.

SAILING DIRECTIONS, KEY WEST HARBOR.

The directions for each channel are given in separate sections. (See also the descriptions of the channels on page 12.) In the following directions allowance must be made for the draft if there is a heavy swell or sea.

1. ***Entering by the Southeast Channel.—In the daytime for vessels of less than 24 feet draft.***—Being outside the reefs and with a depth of 15 fathoms, bring Key West Lighthouse to bear **NW.** ¼ **N.** and steer for it, keeping the lighthouse on the bearing. On this course leave red nun buoys Nos. 2 and 4 about 200 yards on the starboard hand and head directly for Hawk Channel Turn buoy (can, white and black perpendicular stripes.) When up to this buoy leave it close-to on either hand and steer **W.** ⅛ **N.**; pass southward of red buoy No. 6 (see remarks following). Leave this buoy 200 yards on the starboard hand and steer **N.**; on this course black can buoy No. 11 should be left about 150 yards on the port hand, and when it bears abeam, steer **NNE.**, leaving red nun buoy No. 8 on the starboard hand. Anchor about ¼ mile northward of this buoy in 4 to 5 fathoms of water, or continue on to the city wharves, which should be given a berth of 100 yards.

At night for vessels of less than 16 feet draft.—While outside the reefs and in the white rays of Sand Key Light, bring Key West Light to bear **NW.** ¼ **N.**, which will be on the edge of a red sector in the light. Steer for Key West Light on this bearing and keep on the edge of the red sector. When Sand Key Light changes from red to white haul sharp to port and steer **W.** ¾ **N.** for 2¼ miles; Key West Light will then show white and bear **NE.** ¼ **N.**; then change the course to **N.** by **E.** ¼ **E.** and anchor in 4 to 5 fathoms of water when westward of the Lazaretto.

Remarks.—When standing for Key West Lighthouse on the **NW.** ¼ **N.** course, care must be taken to keep close on the bearing as there are a number of shoal spots on both sides of the channel. It is not advisable for vessels of over 21 feet draft to go above red buoy No. 6 without a pilot. Vessels of this draft should anchor southeastward of red buoy No. 6 in about 5 fathoms of water. When standing on the **NNE.** course from black buoy No. 11, red buoy No. 8 should be left 150 yards on the starboard hand, and if the vessel is subject to visitation by the health officer she should come to near this buoy. Two black can buoys (Nos. 15 and 17) mark the edge of the channel abreast the city wharves; they should be left on the port hand when standing along the wharves or if bound into Man-of-War Harbor. When entering at night care must be taken not to foul the buoys.

Dangers.—**Whitehead Spit** makes off ⅝ mile from the southwestern point of Key West Island. Its extremity is marked by red buoy No. 6, which lies in 30 feet of water, and must be left on the starboard hand by vessels entering the harbor.

Middle Ground Shoal lies westward of the island of Key West, distant about ¼ mile. Its southeastern end forms the western boundary of the harbor proper and is marked by two buoys—South Middle Ground buoy (black, No. 11), lying in 21 feet of water off the south end of the shoal, and Inner Middle Ground buoy (black, No. 13), lying in 18 feet of water on the northwest side of the harbor. Both these buoys must be left on the port hand by vessels entering the harbor.

Fort Taylor Shoal extends about 200 yards westward from Fort Taylor; it is part of the same shoal which extends from Whitehead Spit along the western shore of Key West Island. The edge of the shoal is marked by a buoy (red, No. 8).

Frankford Bank is an extensive shoal lying westward of the Inner Harbor or Man-of-War Harbor. Its south point is marked by a black buoy (No. 15), which lies in 20 feet of water, and its eastern edge by black buoy No. 17 in 18 feet of water. These buoys must be left on the port hand by vessels entering the Inner Harbor.

1 A. ***Entering by the Point of Reef Channel.—In the daytime or night for vessels of 14 feet or less draft.***—Keep Sand Key Lighthouse bearing westward of **W.** $\frac{5}{8}$ **S.** until Key West Lighthouse is brought on the bearing of **N.** by **W.** $\frac{3}{8}$ **W.** Steer for Key West Lighthouse, keeping it on this bearing until Sand Key Lighthouse bears **SW.** $\frac{1}{4}$ **W.**, or, at night, when it changes from red to white. Then steer **NW.** by **W.**; pass 200 yards southward of red buoy No. 6, and when Key West Lighthouse bears **NE.**, or the Lazaretto is opened westward of Fort Taylor, change the course to **N.** by **E.** $\frac{1}{4}$ **E.** Leave black buoy No. 11 on the port hand and red buoy No. 8 on the starboard hand and anchor westward of the Lazaretto, or stand for the city wharves.

Remarks.—The bearing of Key West Lighthouse, when standing for it, should be kept closely, as there are scattered spots with 10 to 17 feet of water over them on both sides of the channel, which has a width of less than $\frac{1}{4}$ mile. (See also the remarks and dangers under section 1 preceding.)

1 B. ***Entering by the Main Ship Channel.—In the daytime for vessels of less than 26 feet draft.***—When over $1\frac{1}{2}$ miles eastward of Sand Key Lighthouse keep it bearing westward of **W.** $\frac{5}{8}$ **S.** until Key West Lighthouse is brought to bear **N.** $\frac{1}{4}$ **W.** Steer for Key West Lighthouse on this bearing until up to the Entrance buoy (nun, white and black perpendicular stripes), leave this buoy close-to on either hand and steer **N.** $\frac{1}{2}$ **W. Westerly**, heading for the Main Ship Channel Range. On this course leave red buoys Nos. 2 and 4 on the starboard hand and black buoys Nos. 1 and 3 on the port hand. Eastern Triangle Beacon Light* should be a little on the starboard bow and be left on the starboard hand. When about $\frac{3}{8}$ mile northward of Eastern Triangle Beacon Light,* and Sand Key Lighthouse bears **SW. Southerly**, change the course to **NW.** by **N.** Anchor a little over $\frac{1}{4}$ mile southward of red buoy No. 6, with Key West Lighthouse bearing about **NNE.**

If of less than 21 feet draft, continue the **NW.** by **N.** course; leave red buoy No. 6 about 200 yards on the starboard hand; from this buoy follow the directions in section 1 preceding.

Remarks.—On the **N.** $\frac{1}{2}$ **W. Westerly** course, Fort Taylor should be a little on the port bow and the western shore of Key West Island be ahead. The front beacon of the Main Ship Channel Range is a white pyramidal framework on the shore end of the wharf which runs out to Fort Taylor; the rear beacon of the range is a white platform on the ridge of the buoy shed on the Lighthouse Establishment wharf. Both of these beacons show a red light at night. When the buoys are made the vessel should head fair between them on this course. The channel is very narrow between buoys Nos. 3 and 4. On the **NW.** by **N.** course red buoy No. 6 should be on the starboard bow, and the red and black horizontally striped buoy on Raleigh Rock is left well on the starboard hand.

If bound to the anchorage off the Lazaretto or to the city wharves see the remarks and dangers under section 1 preceding.

At night for vessels of less than 15 feet draft.—Keep in the white rays of Sand Key Light until Key West Light bears about **N.** $\frac{1}{4}$ **W.** Steer for Key West Light on this bearing, taking care to keep on the edge of the red sector in the light until the two red lights of the Main Ship Channel Range are in line; then stand in on the range, course **N.** $\frac{1}{2}$ **W. Westerly,** and keep a sharp lookout also so as not to foul the buoys. When Sand Key Light has changed from red to white and Eastern Triangle Beacon Light* has been passed, steer **NW.** by **N.** until Key West Light changes from white to red. Then change the course to **N.** by **E.** $\frac{3}{4}$ **E.** and anchor off the Lazaretto in 4 to 5 fathoms of water.

Remarks.—These directions, while heading for Key West Lighthouse, lead near several spots with 17 feet of water over them. On the **NW.** by **N.** course red buoy No. 6 is left about 250 yards on the starboard hand, and the vessel will be in the white rays of Key West Light. On the **N.** by **E.** $\frac{3}{4}$ **E.** course a red sector in Key West Light will be crossed; a part of the time the light may be obscured by Fort Taylor, and just before the light clears the north end of Fort Taylor black buoy No. 11 should be left 100 yards on the port hand. When the light bears **E.** by **N.** red buoy No. 8 should be 150 yards on the starboard beam.

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*This beacon had not been lighted in September, 1900.

1 C. ***Entering by the Rock Key Channel.—In the daytime, with a smooth sea, for vessels of less than 15 feet draft.***—When a little over ½ mile eastward of Sand Key Lighthouse with it bearing northward of **W.**, bring Middle Ground beacon **"3,"** which is 1¾ miles **N.** by **W.** from the lighthouse, to bear **NNW.** ½ **W.**; steer for the beacon on this bearing, and when Sand Key Lighthouse bears **S.** ⅜ **W.** and the beacon is ¾ mile distant ahead, steer **NNE.** ⅞ **E.** heading for the northwest end of Key West Island. Leave Eighteen-foot Shoal buoy (red, No. 8) about 200 yards on the starboard hand and continue on the course to the anchorage of the Lazaretto, taking care to leave the buoys on the side indicated by their color.

Remarks.—There is a spot with 15 feet and several with 17 feet of water over them lying on both sides of the channel, and as they are not marked great care is necessary while standing on the bearing of the beacon and when the course is changed to **NNE.** ⅞ **E.**

1 D. ***Entering by the Sand Key Channel.—In the daytime, with a smooth sea, for vessels of less than 18 feet draft.***—Being southwestward of Sand Key Lighthouse, as soon as Western Dry Rocks beacon **"2"** is made bring it to bear **W.** distant ⅝ mile. From this position steer **N.** by **E.** ¼ **E.**, with West Crawfish Key directly ahead. When Key West Lighthouse bears **NE.** ¾ **E.**, steer for it on the bearing until the buoy off Whitehead Spit (red, No. 6) is about 2 points forward of the starboard beam, then haul up to **N.** by **E.** ½ **E.** and stand for the anchorage off the Lazaretto, leaving black buoy No. 11 on the port and red bouy No. 8 on the starboard hand.

Remarks.—On the **N.** by **E.** ¼ **E.** course red buoy No. 4 and a red and black horizontally striped buoy will be left nearly ½ mile on the port hand. **West Crawfish Key** is the smallest and most southern of the three keys closest westward of Key West Island. When standing for the key East Crawfish Key will be open to the eastward and Snipe Key to the westward; both these keys are more distant than West Crawfish Key. A shoal extends ⅞ mile to the westward from Middle Ground beacon "3"; to avoid it the beacon should be left 1 mile or more on the starboard hand. On the **NE.** ¾ **E.** course, with Key West Lighthouse ahead, beacon **"3"** should be ¾ mile on the starboard hand when abeam, red buoy No. 6 is left on the starboard hand, and 2¼ miles farther on this course black buoy No. 7 is left on the port hand.

In the daytime or at night, with clear weather, for vessels of less than 14 feet draft.—Bring Sand Key Lighthouse to bear **ENE.** ¼ **E.** distant about 1½ miles, and if Key West Lighthouse can be seen (it will be distant a little over 8 miles), steer for Key West Lighthouse, course **NE.** ½ **N.** Keep the lighthouse close on this bearing until the buoy off Whitehead Spit (red, No. 6) is about ⅜ mile distant ahead; then steer **N.** by **E.** ½ **E.** and stand for the anchorage as directed in the first paragraph of this section.

Remarks.—On the **NE.** ½ **N.** course for Key West Lighthouse beacon **"3"** should be ⅝ mile distant when on the port beam, and the sailing line passes close to a 15-foot spot and two 17-foot spots. Red buoy No. 2, which is about ½ mile northward of Sand Key Lighthouse, should be left nearly ½ mile on the starboard hand, and red buoy No. 8 should be left about 200 yards on the starboard hand when it is passed.

1 E. ***Entering by the Southwest Channel.—In the daytime to carry a depth of 30 feet.***—As soon as Sand Key Lighthouse is sighted bring it to bear **E.** by **N.** and steer for it on this bearing. When the lighthouse is 6¼ miles distant ahead on this bearing, Vestal Shoal buoy (can, black, No. 1) should be a little over ¼ mile on the port beam. Continue on for the lighthouse ¾ mile farther, and then steer **NE.** ⅝ **E. Easterly.** Leave Satan Shoal buoy (can, red and black horizontal stripes) about 200 yards on the starboard hand and red buoys No. 2 and 4 about 400 yards on the starboard hand. Parsonage Shoal buoy (nun, red and black horizontal stripes), which will be made ahead, should be left 100 yards on the starboard hand while heading for Key West Lighthouse. After passing this buoy continue on the **NE.** ⅝ **E. Easterly** course with Key West Lighthouse ahead and pass red buoy No. 6, leaving it 500 yards on the starboard hand when abeam. When Middle Ground beacon **"3"** is in range with Sand Key Lighthouse bearing **S.** by **E.** steer **NE.** by **E.** ½ **E.** for 3¼ miles; the East Martello tower should be ahead on this course. Just before the northwestern corner of Fort Taylor comes in range with the Lazaretto steer **NNE.** ¾ **E.** for the Lazaretto, keeping it slightly open northward of Fort Taylor.

If over 21 *feet draft*, when the buoy off Whitehead Spit (red, No. 6) is about ½ mile distant off the starboard bow, haul eastward and pass a little over ¼ mile southward of the buoy, then anchor in 5 fathoms of water.

If less than 21 *feet draft* continue on the **NNE.** ¾ **E.** course until a **N.** by **E.** ¼ **E.** course will lead about 150 yards eastward of black can buoy No. 11, then steer that course and anchor in 4 to 5 fathoms of water off the Lazaretto.

Remarks.—On the **NE.** ⅝ **E. Easterly** course two black buoys, marking shoals, will be seen some distance northward of the sailing line. There is 19 feet of water on Parsonage Shoal, and the buoy, which is placed on the middle of it, can be left on either hand, giving it a berth of 100 yards; it is said that the best water is southward of the buoy. There are several 17-foot spots about ¼ mile westward of Parsonage Shoal buoy. On the **NE.** by **E.** ½ **E.** course West Crawfish Key Bank buoy (can, black, No. 7) will be left ½ mile on the port hand. (See also the dangers under section 1, on page 122.)

1 F. ***Entering by the West Channel.—In the daytime for vessels of less than 17 feet draft.***—Passing about 3¼ miles south of Marquesas Keys steer **E.** ¼ **N.** so as to pass about 2 miles southward of Boca Grande and Man keys. As soon as entrance to West Channel buoy (can, white and black perpendicular stripes) is made steer for it. Leave this buoy close-to on either hand and steer **ENE.** ⅝ **E.** until up to West Crawfish Key Bank buoy (can, black, No. 7). Pass 400 yards southward of this buoy, and when it is in range with Northwest Passage Lighthouse on a **NNW.** bearing steer for Key West Lighthouse, course about **NE.** ½ **E.** until a **NNE.** course will lead eastward of black buoy No. 11 and clear the wharves of the city. Then steer **NNE.** and anchor off the Lazaretto in 4 to 5 fathoms of water.

Remarks.—The Marquesas Keys must be given a berth of at least 3 miles while southward of their eastern end. The **E.** ¼ **N.** course should lead about ½ mile southward of South buoy (can, white and black perpendicular stripes), which marks the southern entrance of the Boca Grande Channel. When **Boca Grande Key**, the first key eastward of Marquesas Keys, is abeam and about 2 miles distant the Entrance to West Channel buoy should be 2 miles distant ahead. The city of Key West is 9 miles distant in a straight line from this buoy. The **ENE.** ⅝ **E.** course leads about ¾ mile southward of the large shoal which lies between Key West Island and Marquesas Keys. When standing for Key West Lighthouse the red buoy off Whitehead Spit will be made on the starboard bow. (See the dangers under section 1, page 122.)

1 G. ***Entering the Northwest Channel.—In the daytime for vessels of less than 11 feet draft.***—When Northwest Passage Lighthouse is about 5 miles distant bring it to bear **S.** and steer for it on this bearing until up to the entrance bell buoy. Turning Point beacon (red piles) will then be in range with Sand Key Lighthouse. Steer for the beacon, keeping it in range with Sand Key Lighthouse, and pass between the red buoys and black buoys which mark the channel over the bar; when the beacon is about 250 yards distant ahead steer **SE.** ½ **E.** with Key West Lighthouse a very little on the starboard bow. Leave Middle Mid-channel buoy (nun, white and black perpendicular stripes) close-to on either hand and from this buoy steer directly for Key West Lighthouse. Leave black can buoy No. 7 about 150 yards on the port hand and from it steer **SSE.** ⅞ **E.**, leaving black can buoy No. 9 about 300 yards on the port hand and heading directly for Inner Mid-channel buoy (nun, white and black perpendicular stripes). Leave the latter buoy close-to on either hand and steer **SE.** by **E.** so as to pass southward of black can buoy No. 13. Passing southward of this buoy haul up more to the eastward and anchor, or stand for the city wharves, leaving black can buoy No. 15 on the port hand.

Remarks.—The range of Turning Point beacon and Sand Key Lighthouse leads through the dredged channel, which has a depth of about 11 feet in 1900. The range can only be seen on a clear day; at other times the buoys on both sides of the dredged channel must be the guides. From Turning Point beacon, on the **SE.** ½ **E.** course, Key West Lighthouse should be nearly ahead and the Middle Mid-channel buoy should be made directly ahead. Above this buoy it is only necessary to keep a sharp lookout for the buoys and leave them on the proper side. A wreck, marked by a red and black horizontally striped buoy, lies on the Middle Ground about ¾ mile **SE.** by **E.** ¾ **E.** from Inner Mid-channel buoy, but this wreck buoy should be left well on the port hand. When standing to pass southward of black buoy No. 13, the vessel will cross the southern end of the Middle Ground in about 16 feet of water. (See also the dangers under section 1, page 122.)

BOCA GRANDE CHANNEL.*

This channel lies eastward of Marquesas Keys and forms a short cut from the Straits of Florida to the Gulf of Mexico. It has a least depth of 11 feet and is marked by 4 buoys, but is seldom used, as the Northwest Channel from Key West Harbor has as deep water and cuts off more distance for vessels coming from or bound northward or eastward.

The buoys are the only aids and must be closely followed, as the channel leads close to the extensive shoals which make eastward from Marquesas Keys. A **N.** course from the south buoy and a **S.** course from the north entrance buoy will lead through the channel, passing close to mid-channel buoy.

BAHAMA ISLANDS AND BANKS.†

As many vessels navigating the Straits of Florida either enter or leave them by the Providence channels or by crossing the banks, a brief description of these channels, banks, and islands is first given, followed by a more detailed account of such portions as are of importance to vessels approaching and navigating the Providence channels. Persons requiring information concerning other portions are referred to the West India Pilot, Volume II, issued by the British Admiralty, and to the charts and publications of the United States Hydrographic Office.

The entire group extends in Latitude from **27° 24′ N.** to **20° 00′ N.**, and in Longitude from **68° 50′ W.** to **79° 20′ W.** It is very irregular in shape, but, in a general way, may be said to be triangular, the southern side or base trending from the Navidad Bank **W.** by **N.** 600 miles, the northern side about **NW.** by **W.** 720 miles, and the western side **N.** by **W.** 250 miles.

The islands of the group are irregular in shape, and, in general, thinly wooded. The higher ones are about 400 feet high, but the majority are less than 100 feet, while many of the smaller keys rise but a few feet above the surface of the water. The most important product is salt, which is raked in great abundance at many of the islands. Fruit and a coarse description of sponge are also largely exported. Good water is rather scarce; supplies are generally obtainable at Nassau. A most remarkable feature is the exceeding clearness of the sea water, which enables the bottom to be seen at considerable depths and at some distance from aloft. On account of this, the navigation of the banks is conducted almost entirely by eye, care being taken not to run with the sun ahead of the vessel.

The group is divided into two principal portions by the Providence channels. The northernmost portion is known as the **Little Bahama Bank** and the southernmost the **Great Bahama Bank.**

LITTLE BAHAMA BANK.

Under this name are included Great Bahama, Great and Little Abaco islands, and the shoals, keys, and reefs between and northward and westward of them. It extends from the Hole in the Wall, on the **SE.** point of Great Abaco Island, in about Latitude **25° 51′ N.**, Longitude **77° 11′ W.**, in a northwesterly direction about 140 miles, to Latitude **27° 24′ N.**, Longitude **79° 08′ W.** Its breadth varies from 30 to 50 miles.

The eastern and northeastern part of Little Bahama Bank is occupied by **Great Abaco Island** and the keys and reefs lying close to its northeastern side. Great Abaco is the largest of the islands on the bank, having a length of nearly 70 miles, and in some places a breadth of 15 miles. It is all high and well wooded, and is inhabited. Its eastern shore trends north for 47 miles from the **Hole in the Wall**, as its south point is called. About 800 yards from the southern extremity of the island, on one of the hills, is **Abaco Lighthouse** (see page 28), and it is a good point of departure for vessels coming out of, or mark for vessels entering, Northeast Providence Channel. On the hillsides among the trees numerous houses show conspicuously. The coast in front of the hills shows a range of bold bluffs with perpendicular faces. From the headland a narrow tongue of low, flat rock extends about ¼ mile into the sea. Through this the water has washed an arched opening, which is visible from a distance of 3 miles when bearing between **SSW.** and **WSW.**, or the opposite. From this opening comes the name "Hole in the Wall." From this point a narrow spit makes off in a southeasterly direction to a distance of 5 miles. It has from 9 to 15 fathoms on it and rises very abruptly from deep water. It is high water, full and change, at the Hole in the Wall at 8 hours, and the rise of the tide is 3 feet.

An Anchorage protected from northerly winds may be found on this bank in 10 fathoms of water under the southwest point of the island, ¾ of a mile from shore, with the lighthouse bearing **ENE. ¼ E.**

Little Guana Key, or Elbow Key (marked by a lighthouse, see page 28), lies 42 miles **N.** by **E. ¼ E.** from Great Abaco Island Lighthouse. The mainland of Great Abaco Island, opposite Little Guana Key, is rather

*Shown on chart **170**, scale $\frac{1}{80,000}$, price $0.50. †Shown on chart **C**, scale $\frac{1}{1,200,000}$, price $0.50; **1002**, Mercator, price $0.50.

low. Attention to the bearings of Elbow Key Lighthouse should keep the mariner clear of danger, but when in this vicinity at night, with the light not in sight or the reckoning doubtful and the wind from southward, it would be prudent to keep the ship's head offshore, as the lead will not give sufficient warning of danger.

From Little Guana Key, the edge of the bank extends in a general **NW. ¾ W.** direction for 46 miles, then **WNW.** 61 miles, thence **W.** 23 miles, to the northwest corner of the bank. Near the edge of the bank of the first two stretches named there is an almost continuous line of small islands or keys, which are generally low and scantily wooded and can not be seen from any great distance, and should be approached with caution, as they are skirted, at an average distance of about 5 miles, by reefs close to the edge of the bank. **Walker Key**, one of the most prominent, is about 50 feet high and well wooded.

West Edge of the Little Bahama Bank.—The northwestern extremity of this bank lies in latitude **27° 24′ N.**, longitude **79° 08′ W.**, where from 40 to 50 fathoms will be found on the edge of the bank, which rises very abruptly from deep water. From this corner of the bank the width of the straits across to the Florida coast is about 58 miles.

About 2 miles southeast of the northwest corner of the bank is **Northwest Matanilla Shoal**, between which and the edge of the bank proper there is a depth of 15 to 40 fathoms. The shoal itself is about ½ mile in diameter and the least depth on it is 2 fathoms. This shoal and the others lying eastward of it, along the northern edge of the bank, are extremely dangerous to vessels making the entrance to the Straits of Florida from northward and eastward, on account of their abrupt rise from the deep water of the ocean and because of their being entirely unmarked. Vessels in the vicinity of the Northwest Matanilla Shoal should proceed with great caution, taking advantage of every opportunity to check their reckoning.

From its northwest corner the edge of the bank, bordering on the Straits of Florida, takes a **SSW.** direction for about 15 miles, when it sweeps around **S.** and **SSE.** about 32 miles to **Settlement Point**, on the west end of Great Bahama Island. The whole of this part is closely skirted by narrow and shallow sand ridges and detached coral patches, and is extremely dangerous. There are small openings here and there with 3 and 4 fathoms of water in them, and in case of necessity a vessel might be guided by eye into safety on the bank, but the attempt would be extremely hazardous.

The south side of the Little Bahama Bank borders on the northeast and northwest Providence channels, sweeping around in an irregular curve to the westward, for about 125 miles to Settlement Point, on the west end of Bahama Island.

For 14 miles from the Hole in the Wall the edge of the bank is formed by the south end of Great Abaco Island, which, irregular in outline, trends generally **NW.** by **W.** to **Rocky Point.** Soundings in 12 to 14 fathoms will be found within about 1 mile of the shore.

From Rocky Point the edge of the bank trends in a general **NW.** by **N.** direction 45 miles to the east end of Bahama Island, rises very abruptly from deep water, and is skirted by a chain of keys, rocks, and reefs. It is a dangerous shore, which the mariner should avoid. The principal keys are **Gorda Key, Mores Island,** and **Burrow Key.** The first of these lies 9 miles **NW.** by **W.** from Rocky Point. There is an anchorage under the west side of Gorda Key.

Bahama Island is 65 miles in length **E.** and **W.**, and from 5 to 7 miles in width. It is inhabited, thickly wooded, generally level, and from 40 to 50 feet in height. Its south shore is somewhat in the shape of an elongated letter S., sweeping around in a shallow bight from its east point 43 miles, in a general westerly direction, to **Southwest Point,** and thence turning to northward and westward for 23 miles to Settlement Point, on its western extremity. Most of this shore is foul, being skirted by a reef at a distance of 1 to 2 miles.

Tidal Currents.—The tidal currents run on and off the Little Bahama Bank, and near the edge are at times strong. The current in the offing is very uncertain for some distance northward of the bank.

GREAT BAHAMA BANK.

The northeastern extremity of the bank, bordering on the Northeast Providence Channel, lies in about latitude **25° 35′ N.**, longitude **76° 40′ W.**, and consists of the small islands, reefs, and rocks lying from 2 to 5 miles off the shore of the northern part of Eleuthera Island. **Egg Reef**, the farthest offshore in a northwesterly direction, lies on the southeast side of the entrance to the Northeast Providence Channel and rises abruptly from deep water. The vicinity of this reef, both eastward and westward, is dangerous, and great caution should be exercised when approaching it. **Royal Island,** lying inside of Egg Reef and about parallel to it, is about 4½ miles in length **ENE.** and **WSW.**, but very narrow. Near the center of the island are two remarkable wood paps or hammocks close together and about 75 feet high. On the south side of the island there is a snug little harbor for small craft drawing less than 9 feet.

Westward of Royal Island, near the edge of the bank, are **Egg Islands**, on one of which is **Egg Island Lighthouse** (see page 28).

From the western end of Egg Reef the edge of the bank trends about south for 12 miles to **Pimlico Islands**, a range of small, barren, rocky islets, extending about 4 miles in a **SSW.** direction. From these islands the edge of the bank curves gradually westward and extends 42 miles to **Clifton Point**, the western extremity of New Providence Island.

Westward of New Providence Island the bank is broken by a deep body of water, from 15 to 25 miles in width and extending in a southeasterly direction for over 100 miles, called the **Tongue of the Ocean.**

On the southern side of the eastern entrance to Northwest Providence Channel there are numerous islands under the general name of **Berry Islands.** The northernmost of these is called **Great Stirrup Key.** It is about 1¾ miles in length, ¼ of a mile in width, wooded, about 60 feet in height, and on its eastern end stands **Great Stirrup Key Lighthouse** (see page 28).

From abreast of Great Stirrup Key the northern edge of the bank extends in a westerly direction for about 38 miles to the east end of the **Gingerbread Ground.** For this distance it is quite free of dangers and the lead will be a safe guide.

The Gingerbread Ground and the other shoals extending to Great Isaac in a broken line near the edge of the Great Bahama Bank are some of the most dangerous on the bank, the current setting over them with great velocity. This foul ground, full of rocky heads, lies close to the edge of deep water, on dark bottom, not easily seen from a distance, and may be said to extend from the above position given for its east end in a **NW.** by **W.** direction to the Great Isaac, a distance of 30 miles, and is from 2 to 5 miles in breadth.

The northwest corner of the Great Bahama Bank rises abruptly from very deep water to 15 or 20 fathoms. It then shoals gradually to 8 or 10 fathoms for about 5 miles to the **Great Isaac.** This is a narrow, barren, honeycombed rock, about ¾ of a mile in length and marked by a lighthouse (see page 28).

From abreast Great Isaac the edge of the bank extends in a **S.** by **W.** direction for about 18 miles to abreast **North Bemini.** This island and the one just southward of it, **South Bemini**, together about 6 miles in length, lie close to the western edge of the bank. They are irregular in shape and sandy, but partly covered in places with woods to a height of about 40 feet. About 1 mile off the northern end of North Bemini there is a remarkable black rock, appearing like a beacon and known as **North Rock.** Near the southern end of North Bemini there is a grove of cocoanut trees and a small settlement.

From off South Bemini the edge of the bank trends about **S.** for 7 miles to **Gun Key**, which is marked by a lighthouse (see page 28). Temporary anchorage may be found in 7 or 8 fathoms, with the lighthouse bearing **E.**, ¾ mile distant. For this whole distance there is a shoal bank with a range of detached rocks within ¾ of a mile of the edge of the main bank. Of these rocks the most conspicuous are **Turtle Rocks**, 18 feet high; **Picquet Rock**, 12 feet high, and **Holm Key**, 10 feet high. The northern extremity of Picquet Rock is marked by a spar beacon surmounted by a barrel. The tidal currents run through the openings with great velocity.

From abreast Gun Key the edge of the bank trends about **SSE. ½ E.** for 22 miles to **South Riding Rock.** Throughout this distance a shallow sand ridge, with numerous keys and detached rocks, skirts the bank at an average distance of about 1 mile within its edge. Between this ridge and the edge of the bank the soundings are generally clear, shoaling from 10 to 20 fathoms on the edge to about 3 fathoms near the line of keys.

Orange Key, bearing **S. ½ E.** from Riding Rock and about 17 miles distant, is the southernmost islet on the western edge of the Great Bahama Bank. It is a barren rock about 13 feet high and lies 2 miles within the edge of the bank. The ground between it and Riding Rocks is foul and almost choked up with a line of small rocky heads. In some places there are 3 or 4 fathoms of water between them, but, except in case of necessity, it would not be safe to attempt to pass through.

From Orange Key the west side of the Great Bahama Bank trends **S.** and for a distance of 20 miles, to the parallel of **24° 35′ N.**, there are very few shallow patches, although there are depths of 3 and 4 fathoms 1½ miles within its edge.

Vessels crossing the Great Bahama Bank from the Providence Channel clear the bank just southward of Orange Key and enter the Straits of Florida. As the bank southward of this point borders on Santaren Channel, and not on the Straits, no further description of it is given.

SALT KEY BANK.

This bank, bordering on the southeast side of the Straits of Florida, has very much the shape of a pear with its stem end turned southeast. In that direction it has a length of 60 miles from Elbow Key to the south point of Anguilla Island, while its greatest width, from Salt Key to its northeast edge, is about 40 miles. It is separated on the north from the Florida coast by the Straits of Florida, about 50 miles wide; on

the east, from the west side of the Great Bahama Bank, by the **Santaren Channel,** about 30 miles wide, and on the southwest, from the north coast of Cuba, by the **Nicholas Channel,** 25 miles wide.

The bank rises abruptly from deep water and is skirted on all sides except the south, by a line of keys and rocks, which lie but a short distance within its edge. It must therefore be approached with caution from all directions.

The north side of Salt Key Bank borders on the Straits of Florida for nearly 35 miles, trending generally in a **WSW.** direction from the northeast corner. It is skirted by a line of rocks and keys at an average distance of 3 miles within the edge.

On **Elbow Key,** at the northwest corner of the bank, is **Double Headed Shot Key Lighthouse** (see page 28).

The average depth of water over the bank inside the keys is from 4 to 5 fathoms, but in several places there are not more than 3 fathoms, and shoal spots and rocky heads are numerous.

The current of the Gulf Stream does not set across this bank, but runs close to its northwestern side. It is often of great benefit to sailing vessels navigating the Straits when bound westward to run across the bank, or with light winds and calms to anchor upon it.

Tides.—It is high water, full and change, on Salt Key Bank at about 9 hours. Spring tides rise from 2½ to 3½ feet. The direction of the tidal currents and the rise of the tide are much influenced by the wind, but generally the flood sets on to the bank from all sides, and the ebb off.

NORTHEAST AND NORTHWEST PROVIDENCE CHANNELS.

These deep and broad channels separate Little Bahama Bank from Great Bahama Bank. The entrance to Northeast Providence Channel is between the reefs off the northern end of Eleuthera Island and Hole in the Wall, the southern extremity of Great Abaco Island, and between the two the channel is 24 miles wide and has depths of over 2,000 fathoms. This channel connects with Tongue of the Ocean to the southwestward and Northwest Providence Channel to the northwestward. Northwest Providence Channel extends from its eastern entrance between Berry Island and Great Abaco Island in a general **WNW.** direction for about 100 miles to the Straits of Florida, and its width varies from 22 to 53 miles. Where this channel connects with the Straits of Florida it is 37 miles wide and on the southern side of its western entrance is **Great Isaac Lighthouse** (see page 28).

There are no dangers in either of the above-described channels if a vessel keeps well clear of the edges of Little and Great Bahama banks. The currents near the edge of the banks set on and off and should be guarded against. The lighthouses which aid in navigating these channels are given in the table on page 28.

GENERAL REMARKS AND SAILING DIRECTIONS FOR ENTERING THE STRAITS OF FLORIDA THROUGH THE PROVIDENCE CHANNELS.

The greater number of vessels bound to the Gulf of Mexico from ports in Europe, British North America, or the northern Atlantic ports of the United States enter the Straits of Florida from eastward through the Providence channels, which have a least width of 22 miles between Great and Little Bahama banks The point for which a course is shaped, and the first land sighted, is the south point of Great Abaco Island, known as Hole in the Wall. Vessels coming from northward, if at all doubtful of their reckoning, should make Latitude 26° 30′ N., well eastward of the eastern end of Abaco Island, so that in case the wind falls light or the weather becomes thick they will not be picked up by Elbow Key. At night, in a sailing vessel, if the wind is from southward when in this locality, and the light is not sighted or the reckoning is doubtful, the vessel's head should be kept eastward, as the lead will be of little use to give warning of danger. Near the northeastern end of Great Abaco Island the currents are strong and variable and have caused many wrecks in the vicinity of Elbow Key. In the Northeast Providence Channel the currents are also variable and the reefs and keys should not be approached too closely in light winds. In the Northwest Providence Channel, between Great Stirrup Key and Great Isaac, the flood sets southward on the Great Bahama Bank and the ebb northward off the bank. In the middle of the channel the direction of the currents is variable.

Steamers bound to ports in the Gulf of Mexico, after passing Great Isaac, will find it to their advantage to stand across the Straits of Florida for Fowey Rocks Lighthouse and follow the Florida Reefs into the Gulf. The reefs are so well marked in the daytime, and at night by the red sectors in the lights, that no uncertainty as to the position of a vessel is

possible with ordinary care. This route is also shorter than the one along the western edge of Great Bahama Bank and across Salt Key Bank.

Sailing vessels after passing Great Isaac stand along the western edge of Great Bahama Bank for a distance of about 75 to 80 miles and then stand for the northwest end of Salt Key Bank; or, if not over 18 feet draft, they can cross Salt Key Bank south of Double Headed Shot Keys, thus avoiding the strength of the Gulf Stream, which is weaker here than on its western side. From Salt Key Bank the wind generally decides whether the vessel bound into the Gulf of Mexico crosses the Straits of Florida so as to make Sand Key Lighthouse, or follows the north shore of Cuba and crosses the straits so as to pass westward of Tortugas.

Vessels of less than 12 feet draft can stand across the northwest end of the Great Bahama Bank after entering the Northwest Providence Channel, but this should not be attempted unless in the daytime, when the rocky patches can be seen so as to be avoided. A vessel using this route will leave the western edge of Great Bahama Bank about 78 miles southward of Great Isaac Lighthouse. The distance with a depth of less than 4 fathoms will be 70 miles; about half of this distance carries a depth of a little more than 2 fathoms; 15 miles of this is known as the Flats or Middle Ground, which has narrow sand ridges and small black heads, between which the vessel must be guided by eye. It is high water, full and change, on the bank at 8 hours and 0 minutes, and the current has a velocity of ½ to 1 mile per hour to within a short distance of the north side of the Middle Ground. On the Flats or Middle Ground there is little current, and on the south side of the Middle Ground the current sets regularly around the compass from **E.** to **S.** and **W.**, from high to low water, and the contrary. On the parallel of 25° N., and about 16 miles eastward of Orange Key, it is not high water, full and change, before 10 hours 15 minutes, and the rise is 3 feet, so that a vessel will carry 2 hours more of high water across the shallower part of the bank. A steamer of 13 feet draft, coming from northward and making the northern edge of the Middle Ground at ¾ flood, may cross before the tide begins to fall.

1. ***From Hole in the Wall Through the Providence Channels and Straits of Florida to the Gulf of Mexico or the North Coast of Cuba.—For vessels of 12 feet or more draft.***—When Hole in the Wall Lighthouse is made, steer so as to pass from 3 to 5 miles southward of it and steer **W.** by **N.**, taking care not to be set southward by the flood current when westward of Great Stirrup Key; this course leaves Great Stirrup Key Lighthouse 5 miles on the port beam, and made good for 95 miles should lead to a position from which Great Isaac Lighthouse bears **SW.** by **W.**, distant 6 miles, and the vessel should be in about 10 fathoms of water near the northern edge of the bank.

With Great Isaac Lighthouse in sight bearing **SW.** by **W.**, and about 6 miles distant, steer so as to pass about 3 miles northward of the lighthouse. With Great Isaac Lighthouse bearing **S.**, distant 3 miles, a vessel of 10 knots speed should steer **SW.** ¼ **W.** for 60 miles, or a vessel of 12 knots speed should steer **SW.** ½ **W.** for 60 miles. Fowey Rocks Lighthouse should be made nearly ahead. A vessel making the reefs southward of the lighthouse should keep it bearing to the westward of **N.** ¼ **W.**; making the reefs northward of Fowey Rocks Lighthouse it should be kept bearing westward of **S.** ½ **W.** Passing 1 mile eastward of Fowey Rocks Lighthouse, follow the directions in section 5, page 41.

Remarks.—A narrow spit, with 9 to 15 fathoms over it, extends 5 miles in a **SE.** direction from Hole in the Wall. The width of the entrance of the Northeast Providence Channel in a southeasterly direction from Hole in the Wall is 24 miles, and of the entrance to the Northwest Providence Channel in a northeasterly direction from Great Stirrup Key is 22 miles. This is the least width in either of the channels. When passing Great Stirrup Key Lighthouse care should be taken to check the vessel's distance from the lighthouse when it bears **S.** The **W.** by **N.** course, after passing Great Stirrup Key, should lead from 6 to 9 miles northward of Gingerbread Ground. This is a dangerous shoal about 11 miles long in a general **SE.** by **E.** and **NW.** by **W.** direction, rising abruptly from the deep water at the edge of the bank. The middle of Gingerbread Ground is 41 miles **W.** ¼ **N.** from Great Stirrup Key Lighthouse and 26 miles **ESE.** ¼ **E.** from Great Isaac Lighthouse.

Between the Gingerbread Ground and Great Isaac are a number of shoals and bare rocks, the latter from 6 to 12 feet high. These are known as the **East Isaac, Middle Isaac, Little Isaac, East Brother, West Brother,** and **Northeast Rock.** The latter lies 1½ miles **NE.** by **E.** from Great Isaac Lighthouse. It is said by Bahama pilots that some rocks, with not more than 12 feet of water over them, lie about 1½ miles northward of Northeast Rock in line with the east end of Great Isaac (1844).

Hen and Chickens is a group of barren rocks, the highest being 14 feet high, which lie about 3 miles **SW.** from Great Isaac. On a clear night Fowey Rocks Light should be made when the vessel has run about 28 miles after dropping Great Isaac Light.

To cross Great Bahama Bank.*—Vessels of less than 12 feet draft can pass about 1½ miles northward of Great Stirrup Key Lighthouse and bring the lighthouse to bear **ESE.** distant 4 miles; then steer **SW.** by **W.** for 33 miles to the edge of the Middle Ground. Thence a **SW.** ⅛ **S.** course made good for 65 miles should cross the Middle Ground and pass into the Straits of Florida 14 miles southward of Orange Key.

Remarks.—In crossing the Middle Ground the eye must guide the vessel between the numerous clear white sand ridges and small black heads, which are easily seen even in the night time if the weather is clear. Some attention should be paid to the tide on the **SW.** by **W.** course. Should a vessel enter upon the bank with the first of the flood and a commanding breeze she should steer a little more westward, and more southward if she enters on the first of the ebb. On the **SW.** by **W.** course the depth should decrease gradually to the Middle Ground. The **SW.** ⅛ **S.** course should lead 5 to 6 miles eastward and in sight of Orange Key.

Although the water is shallow and clear the lead should be used (the line being marked to feet). The approach to the banks on both sides of the sailing line is indicated by a gradual shoaling of the water. If eastward of the track and approaching what is known as **Long Bank** the little heads of sponge and dark fans will become more numerous. In the winter months, should the wind haul southward (a sure indication of a northwester), it is advisable to anchor and await the change instead of beating about among the shoals.

To stand along the western edge of Great Bahama Bank.—If possible daylight should be selected for the run.†

Having rounded Great Isaac Lighthouse shape a course to clear Hen and Chickens and then along the Keys, taking care in the night not to come within the depth of 10 fathoms or to bring the lighthouse to bear northward of **NE.** ½ **N.** until Moselle Shoal is passed, or, from aloft, Gun Key Lighthouse is opened westward of the Bemini Islands.

After passing North Bemini the Key must be closely hugged in order to avoid the Gulf Stream, which comes close home to the rocks with its full strength. A short calm within 1 mile of the edge of the bank might allow a vessel to drift so far northward as to oblige her to run out around the Little Bahama Bank and to enter again from eastward. Instead of attempting to beat along with a light wind it will be prudent to anchor under North Bemini and wait a slant to get around the elbow.

Vessels proceeding westward from the Great Bahama Bank should endeavor to strike soundings on the northwest end of Salt Key Bank. Should the wind be scant from westward they may run in on the bank on either side of Dog Rocks and pass off southward of the Double Headed Shot Keys; or, should the wind be light and tending to calm, they may anchor on the bank to avoid being set northward. At night vessels had better run down westward of the bank, paying great attention to the lead.

It is advisable for sailing vessels not to stand over for Salt Key Bank until after reaching Orange Key. In the summer months, when light southeasterly winds prevail, a strong northwest current frequently runs into the Straits of Florida from Santaren Channel, and vessels meeting with a calm or light airs at this period are sometimes drifted through the straits, even in sight of the keys along the bank.

Having passed Elbow Key Lighthouse and being clear of Salt Key Bank, the course should be about **SW.** ½ **W.** until close over to the coast of Cuba, to avoid the strength of the current. This course should lead toward the peak of Matanzas, and within about 12 miles northwest of Piedras Key Lighthouse, but this will depend upon where the vessel leaves the bank, and the set of the current which is very uncertain and sometimes strong into the Nicholas Channel. If bound to ports of the United States on the Gulf of Mexico, keep along the coast of Cuba as far west as Mariel, about 22 miles westward of Habana, and then shape a course to pass westward of Tortugas.

Vessels may shorten the passage by crossing over from Orange Key to the coast of Florida, and then proceeding as directed on pages 41 or 42.

Vessels coming down the Florida coast, and bound for Habana, generally shape a course for that port when abreast of Alligator Reef Lighthouse (see table, page 24).

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*See the remarks preceding section 1, on page 130.

†See charts 14, 15, scale $\frac{1}{400,000}$, price of each $0.50.

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APPENDIX I.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

NORTH CAROLINA.

PILOTS AND PILOTAGE.

Extracts from the Code of North Carolina, 1883, Chapter 46.

Section 3496. *When master of vessel need not take a pilot.*—No master of a vessel shall be required to take or keep a pilot on board or pay for pilotage in the river or over the bars who is or has been a full branch pilot or employs a full branch pilot as first mate of his vessel.

Sec. 3495. *Rate of pilotage when vessel is detained.*—Every master of a vessel who shall detain a pilot at the time appointed, so that he can not proceed to sea, though wind and weather should permit, shall pay to such pilot three dollars per day during the time of his actual detention.

Sec. 3520. *Pay to pilots for detention; pay when driven off coast after boarding.*—If the master of any vessel shall send for or take on board any pilot to conduct his vessel from her station to any other place, and shall afterwards neglect or delay to remove such vessel (wind and weather permitting), he shall pay to the pilot two dollars for attending each day he shall be so detained; and if any vessel which shall be boarded by a pilot, without or within any of the inlets, shall by violence of the weather or otherwise be driven to sea, the master or owner of such vessel shall allow and pay the pilot two dollars per day for every day he shall be on board, besides the fees of pilotage.

Sec. 3505. *Pilot entiled to full pay though refused when.*—When any master of a vessel shall refuse a pilot either up or down the Cape Fear River, then each pilot so refused shall be entitled to the full pilotage in the same manner as he would have been had he been actually employed for the purpose of piloting such vessel. But any vessel under sixty tons burden shall not be compelled to take a pilot while crossing the bar, or pay pilotage except where signals are made for a pilot; and no vessel coming in at either of said inlets with a view to the more convenient prosecution of her voyage, or to make a harbor, shall be subject to the payment of pilotage.

Sec. 3522. *Pilots when refused to be paid.*—If a branch pilot shall go off to any vessel bound in, and offer to pilot her over the bar, the master or commander of such vessel, if he refuse to take such pilot, shall pay to such pilot, if not previously furnished with one, the same sum as is allowed by law for conducting such vessel in: *Provided*, That the first pilot who shall speak such vessel so bound in shall be entitled to the pay provided for in this section and no other.

Sec. 3503. *One-third fee to be paid to pilots in certain cases.*—When any vessel shall come over the bar before a pilot boards her, she shall pay only one-third fees for coming in, unless when it may happen the weather is so bad that no person can board a vessel, in which case, if he shall hail her without the bar, he shall be entitled to full fees.

Sec. 3504. *Pilotage when vessels deepened or lightened.*—If any vessel deepens or lightens between Wilmington and the flats and Brunswick or between Brunswick and Fort Johnson, the pilot shall be paid for the greatest draft of water, and shall besides be entitled to demand, at the rate of two dollars per day, for every day, or part of a day he may be delayed in loading or unloading such vessel.

Sec. 3523. *No pilotage on ships under sixty tons; exceptions.*—No pilot acting under the authority of the commissioners of navigation for Newbern, Edenton, Washington or Old Topsail Inlet, shall be entitled to pilotage for any vessel under sixty tons burden, unless such vessel shall have given a signal for a pilot, or otherwise shall have required the assistance of a pilot.

Laws of North Carolina, Session of 1887, Chapter 416.

Sec. 3. That the commanders of all vessels of sixty tons or more, and all steam or sail yachts of forty tons or more, shall be compelled to take a pilot before crossing the bar upon being hailed by a pilot, and that any pilot bringing a vessel or yacht into port shall be compelled and entitled to carry said vessel or yacht out of port and entitled to his pilotage fees for the same, unless for sufficient cause, to be adjudged by the commissioners of navigation for the port.

Sec. 6. This act shall apply only to the port of Beaufort and the pilots thereof.

Chapter 95.

Sec. 3. That the following shall be the rates of pilotage from sea to Southport and vice versa, and from sea to Wilmington and vice versa:

	Southport.	Wilmington.		Southport.	Wilmington.
6 and under 6½ feet	$12.50	$18.50	13½ and under 14 feet	$42.00	$63.00
6½ " 7 "	13.25	20.25	14 " 14½ "	46.00	69.00
7 " 7½ "	14.75	22.75	14½ " 15 "	52.00	78.00
7½ " 8 "	15.50	24.00	15 " 15½ "	57.00	86.00
8 " 8½ "	16.00	25.00	15½ " 16 "	61.00	93.00
8½ " 9 "	17.25	26.75	16 " 16½ "	67.00	103.00
9 " 9½ "	17.75	27.50	16½ " 17 "	73.00	113.00
9½ " 10 "	19.00	29.50	17 " 17½ "	80.00	123.00
10 " 10½ "	20.00	31.25	17½ " 18 "	87.00	133.00
10½ " 11 "	23.00	35.00	18 " 18½ "	94.00	143.00
11 " 11½ "	25.00	38.25	18½ " 19 "	102.00	
11½ " 12 "	27.50	42.50	19 " 19½ "	110.00	
12 " 12½ "	30.50	46.50	19½ " 20 "	120.00	
12½ " 13 "	34.00	52.00	20 " 20½ "	130.00	
13 " 13½ "	39.00	58.50			

Session of 1889, Chapter 46.

Sec. 2. That section three of chapter ninety-five, laws of one thousand eight hundred and eighty-seven, be amended by adding: "That every vessel coming into Southport, seeking or for orders, and going away light, shall pay one-half the rate of pilotage from sea to Wilmington, in and out."

Session of 1891, Chapter 486.

Sec. 1. That all steam vessels calling at Southport on the Cape Fear River for coal for their own consumption shall only pay one-half the rate of pilotage from sea to Southport in and out as now established by law.

Session of 1897, Chapter 121.

Sec. 1. That the present rate of pilotage of the Cape Fear bar and river be reduced twenty-five per cent on vessels under coastwise license.

Extracts from the Code of North Carolina, 1883, Chapter 46.

Sec. 3524. *Rates of pilotage for Edenton, Washington, Newbern, Ocracoke and Hatteras.*—Branch pilots of Edenton, Washington, Newbern, Ocracoke or Hatteras shall be entitled to receive of the commander of such vessel as they may have in charge the following pilotage, namely: For every vessel of sixty and not over one hundred and forty tons burden, from the other side of the bar, at any place within the limits of the pilot ground, to Beacon Island Road or Wallace's Channel, ten cents for each ton, and the further sum of two and a half cents for each ton over one hundred and forty, and two dollars for each vessel over either of the swashes (that is, over said swashes either to or from Beacon Island Road, or Wallace's Channel, or over any shoal lying intermediate between either of said swashes and Beacon Island Road or Wallace's Channel); for every ship or vessel from the mouth of the swash to either of the ports of Newbern or Washington, one dollar per foot, and for every ship or vessel from the same place to the port of Edenton, twelve dollars; and to the port of Elizabeth City, ten dollars; and the same allowances down as up, and outwards as inwards.

Sec. 3534. *Rates of pilotage at Old Topsail Inlet.*—The branch pilots for Old Topsail Inlet shall be entitled to receive of the commander of such vessel as they may have charge of the following pilotage,* namely: For every vessel of sixty tons burden, from the outside of the inlet, at any place within the limits of pilot ground, into Bogue Road or Shackleford

* Sec. 3530 gives the commissioners of navigation authority to increase these rates twenty-five per cent, at their discretion.

Road, at the option of the commander, six dollars; for vessels drawing eight feet of water and less than twelve, one dollar per foot; for all vessels drawing twelve feet or upwards, one dollar and twenty-five cents per foot; and the same fees for piloting outwards as inwards.

Sec. 3535. Rates of pilotage at Bogue Inlet.—The branch pilots for Bogue Inlet shall be entitled to receive of the commander of such vessel as they may have charge of the following pilotage, namely: For bringing any vessel into the said inlet, drawing less than seven feet, from the outside of the bar to the anchorage before the town, or the customary place in Hill's Channel, fifty cents per foot; for a vessel drawing more than seven feet, seventy-five cents per foot; and the same fees for pilotage outwards as inwards.

Sec. 3536. Fees of pilots to be annexed to their commissions.—The commissioners of navigation for the several ports of this State shall annex to the branch or commission, by them given to each pilot, a copy of the fees to which such pilot is entitled.

Extract from laws of North Carolina, Session of 1881, Chapter 147.

Sec. 1. That no vessel sailing in or out of the inlets at Hatteras or Ocracoke shall be required to pay pilotage in or out of said inlets or over the swashes thereof, except upon stipulations or agreements of pilots with the commanders of such vessels, whenever said commanders shall produce a certificate from the board of navigation of the towns of Newbern, Washington, Elizabeth City, or Edenton, or the commissioners of navigation at Hatteras Inlet, setting forth that the commander is a competent pilot for said inlet through which such vessel is about to pass.

HARBOR CONTROL.

Extract from the Code of North Carolina, 1883, Chapter 46.

Sec. 3537. * * * *Penalty for throwing ballast, stone, etc., into navigable waters, or pulling down beacons.*—* * * and if any person shall cast or throw from any vessel, into the navigable waters of Carteret or Onslow counties, of Tar or Pamlico river, or into the navigable waters of the Cape Fear, or any other river in the state, or into any channel of navigable water elsewhere than in a river, any ballast, stone, shells, earth, trash, or other substance likely to be injurious to the navigation of such waters, rivers, or channels; or if any person shall wilfully pull down any beacon, stake, or other mark, erected or placed in virtue of this chapter, or any by-law, order or regulation, passed or ordained in pursuance thereof, the person so offending shall be guilty of a misdemeanor, and forfeit and pay two hundred dollars, to be recovered for the use of the commissioners in whose waters the offense was committed.

QUARANTINE.

Extracts from the Code of North Carolina, 1883, Chapter 24.

Sec. 2894. Vessels coming from infected place to anchor at quarantine ground; coming into port without permission, master or pilot indictable.—If any vessel shall be brought into the state from a place which at the time of her departure was infected with the yellow fever, smallpox, or other infectious disorder; or if any vessel, arriving in the state, shall have the smallpox or yellow fever or other infectious disorder on board, during the passage to the state, such vessel shall be anchored at the place appointed for quarantine, and there remain, until permitted to remove by the commissioners of navigation or by the commissioners of the town to which the vessel is bound, or by the justices aforesaid; and if any such vessel shall come to such town, or into its harbor, without permission obtained as aforesaid, the pilot or master, conducting the vessel, or ordering or permitting her to be conducted to such town or harbor, shall be guilty of a misdemeanor, and fined not less than one thousand dollars, and imprisoned not exceeding one year.

Sec. 2895. Such vessel to be removed.—The commissioners of navigation, or the commissioners of the town, in the harbor of which any vessel shall have arrived in violation of this chapter, or the justices as aforesaid, may use such force as shall be necessary to remove said vessel to the place of quarantine; their reasonable charge for which service shall be paid by the master or owner of the vessel, and may be recovered of either of them before any court having jurisdiction.

Sec. 2916. (As amended in 1891.) Every vessel subject to visit and inspection shall pay a fee of five dollars if of less than two hundred and fifty tons burthen; if of more than two hundred and fifty and less than five hundred tons burthen, eight dollars; if of more than five hundred and less than one thousand tons burthen, ten dollars; if of over one thousand tons, fifteen dollars, * * * *.

Sec. 2897. Penalty on passengers or crews breaking quarantine.—When a vessel shall be directed to perform quarantine, and any seaman or passenger shall, contrary to the order and direction of the commissioners or justices as aforesaid, leave the vessel and land on any

other place than they shall allow of, every person offending shall forfeit and pay two hundred dollars for each offense; and when he shall have left the vessel with the master's consent, the master shall pay a like penalty of two hundred dollars for every such offense of any of his passengers or seamen.

(See also National Quarantines in Appendix IV.)

PORT OF WILMINGTON.

Extracts from the Rules and Regulations of the Port of Wilmington, July 1, 1895.

It shall be the duty of the harbor master to secure berths for discharging ballast and other cargoes on the arrival of any vessel in this port, and no vessel shall take a berth for discharging ballast until notified by the harbor master to do so; and it shall be further ordered that no vessel shall discharge ballast on lighters while laying in the stream unless notified by the harbor master to do so; and all vessels whether laying in the stream or alongside of any dock in this port, waiting orders or loading, shall be subject to the orders of the harbor master.

HARBOR MASTER'S FEES.—Consignees and masters of all vessels, arriving in this port, shall be exempt from all other charges of the harbor master, by paying the following sums:

If over 100 tons and under 300 tons	$3.00
If over 300 tons and under 500 tons	5.00
If over 500 tons and under 700 tons	7.00
If over 700 tons and under 1,000 tons and over	10.00

1. All ballast, coal or other substance calculated to injure the river, shall be safely placed not less than four feet from the cap of the wharf; and in delivering or landing, must be done under such precautions as to prevent the escape of any portion into the river, under the penalty of fifty dollars. No ballast or coal shall be discharged from any vessel, while in this port after dark or before sunrise, under a penalty of one hundred dollars for each and every offense, to be paid by the captain. And no trash or substance calculated in any manner to injure the navigation, shall be thrown into the river, or discharged while in the stream into lighters, under a penalty of ten dollars for each and every offense, to be paid by the party offending.

2. All vessels crossing the bars either in or out, or navigating the rivers from or to the sea, shall be required to pay full pilotage to the pilot offering his services, whether such craft be in tow or otherwise—and that any pilot neglecting or detaining a vessel under his charge unnecessarily, shall suffer the severest penalty of the law. ORDERED FURTHER, That any person, without the authority of this board, attempting to pilot a vessel, or charging for such services, shall pay a penalty of forty dollars.

3. Any vessel hoisting her colors for a pilot, shall be compelled to pay the pilot offering his services full pilotage, whether such pilot be employed or not.

4. When no pilot is in attendance, any person may conduct into port any vessel in danger from stress of weather, or in a leaky condition; but if any person not duly qualified or licensed, shall presume to act as pilot under any other circumstances, he shall forfeit and pay forty dollars.

5. No master of a vessel shall be required to take or keep a pilot on board, or pay for pilotage in the river or over the bars, who is a pilot, or employs a full branch pilot as first mate of his vessel. Said master or mate must have leave of absence from this board, to exempt such vessel from pilotage charges.

6. Every master of a vessel who shall detain a pilot after the time appointed, so that he can not proceed to sea, though wind and water should permit, shall pay such pilot three dollars per day during the time of his actual detention; and if any vessel, which shall be boarded by a pilot, without or within any of the inlets, shall, by violence of the weather or otherwise, be driven to sea, the master or owner of such vessel shall allow and pay the pilot three dollars per day for every day he shall be on board, besides the fee of pilotage.

*7. All vessels at anchor or under way, within the bars of Cape Fear River, at night, shall exhibit a light in some conspicuous place, at least ten feet above the deck, so as to be seen by vessels or steamboats passing up and down the river, under a penalty of one hundred dollars for each and every neglect, and shall also be liable for all damages or the amount of injury sustained by any vessel or boat coming in contact, to be recovered for the benefit of the injured party. And it shall be the duty of the pilots to notify the master of each vessel coming over the bar of the existence of this order.

8. No vessel shall anchor in the river, or extend her fasts as to interrupt the navigation of said river, or the passage of the ferry boats to and from the usual place of landing on either side of the river, under the penalty of fifty dollars for each and every offense, after notice from the harbor master.

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*See also Appendix V, Inland Rules.

9. No vessel shall extend her hull, bowsprit, yards, rigging, or fasts so as to interrupt the passage into or out of the public docks, under the penalty of five dollars for each and every hour said offense shall continue, after notice from the harbor master.

10. No vessel that has discharged, or that is not engaged in discharging or taking on board a cargo, shall keep her place at any wharf, when, for the convenience of discharging or taking on board a cargo, said place may be required by any other vessel, under the penalty of fifty dollars for each and every day such offense shall continue.

11. No vessel shall careen for the purpose of burning, cleaning or repairing, at any wharf within the limits of Wilmington except at regular shipyards, under a penalty of one hundred dollars for each and every offense.

12. No master or commander of a vessel shall disobey or neglect such orders and directions as may be given by the harbor master, in times of gales of wind, relating to the safety of vessels in the harbor, under the penalty of one hundred dollars for each and every offense, to be paid by the master or commander of said vessel.

13. No vessel having on board grain, or articles evidently in a state of putrefaction, or offensive, shall haul to or lay at any wharf, but shall anchor in the middle of the river until the order of the board shall be known, under the penalty of one hundred dollars for each and every hour said offense shall continue, after notice from the harbor master. Nor shall any vessel discharge offensive bilge water within the limits of the city of Wilmington, under penalty of fifty dollars.

14. No vessel shall lay at any wharf with her yards and booms otherwise trimmed than as the harbor master shall direct, under the penalty of fifty dollars for each and every day said offense shall continue, to be paid by the master or commander of said vessel.

15. No vessel, whether loaded or empty, shall lay at anchor in the river opposite the city, between Red Cross and Castle streets, or obstruct the channel at any point, under a penalty of fifty dollars, after notice from the harbor master.

16. If a branch pilot shall go off to any vessel bound in, and offer to pilot her over the bar, the master or commander of such vessel, if he refuses such pilot (except lawfully exempt), shall pay such pilot the lawful pilotage.

18. The board of commissioners may designate the place whereat, within the waters under their control, may be cast and thrown ballast, trash, stones, and such like matter; and if any person shall cast or throw from any vessel into said waters any such substances, likely to be injurious to the navigation, shall forfeit and pay two hundred dollars. And if any pilot shall knowingly suffer such unlawful act to be done, and shall not, within ten days thereafter, give information to some one of this board, he shall be subject to the lawful punishment.

19. Authority is vested in the commissioners to hear and determine all matters of dispute between pilots and masters of vessels, or between pilots themselves, respecting the pilotage of vessels—appeal in certain cases to be allowed.

20. On the arrival of any vessel at this port, it shall be the duty of the harbor master to go on board and deliver to the captain or officer in charge of such vessel, the port regulations, under a penalty of ten dollars.

22. No vessel under sixty tons shall be compelled to take a pilot or pay pilotage unless a signal for a pilot shall be made.

25. The harbor master shall have power to regulate all fires which are burning or kindled on rafts, decks of flatboats, or lighters, and any owner, or agent of the owner, refusing to obey the orders of the harbor master, shall be liable to a fine of fifty dollars for every violation.

28. Vessels shall be exempt from pilotage charges when the master or first mate holds a full branch and leave of absence from this board.

29. In all violations of these ordinances, wherein no forfeiture is specified, a penalty not exceeding fifty dollars may be imposed, according to the aggravation of the case.

30. During the recess of the board the chairman shall be empowered to try and determine all cases of delinquency occurring, and an appeal from his decision to this board being allowed; and all matters connected with the navigation and regulations of the port, during the recess of the board shall be under his immediate supervision and control.

31. Any pilot, after having been notified for the purpose, who shall fail to be on board any vessel at the time set for sailing, shall forfeit and pay the captain ten dollars for each day's delay (unless at the time he shall have personal charge of some other vessel), and the further sum of one day's expense of such vessel. Pilots, however, may require advance pay for pilotage.

32. Pilots navigating vessels into port shall be entitled, exclusively, to navigate such vessels out of port, provided they be in attendance when the vessel is ready to sail; otherwise the captain may employ any other suitable pilot. Any pilot or other persons navigating a vessel contrary to the meaning of this regulation, shall forfeit and pay the injured pilot forty dollars.

34. All flats, lighters, or other boats or vessels, employed within the limits of the City of Wilmington, propelled wholly or in parts by gigs or poles, are hereby prohibited from using upon the ends of said gigs or poles, any iron or other metal points so sharpened as to make indentation into wood. And any vessel, steamer, or package of goods, receiving damage from the use of said gigs or poles, the owner or agent of the owners of the flat or lighter, shall be liable for the full amount of damage arising therefrom. And any person or persons employed as crew of said flat or lighter, who shall violate this ordnance, shall be fined not less than five dollars for each and every offense.

35. Any person casting loose or adrift, any flat, raft or raft of turpentine, or any boat or vessel, without the consent of the harbor master, had and obtained, shall be punished by a fine of ten dollars for each and every offense. One-half of the said fine shall, when collected, be paid to the person or persons giving information to the harbor master.

36. From and after this date any person piling wood, or any other material merchandise, in such manner as to prevent or obstruct the fastening of vessels at any piling or ringbolt, placed upon any wharf for the purpose of securing any vessels shall forfeit five dollars for each and every hour said obstruction shall remain, after notice from the harbor master; said fines to be collected in the same manner as other fines imposed by this board.

37. That hereafter no pilot shall leave a vessel on the river without the consent of the master, and when any detention shall occur, by the fault of the master of any vessel, the pilot shall be entited to three dollars per day for every day so detained.

38. No vessel shall take or keep a berth in any dock contrary to the harbor master's directions.

39. The harbor master is authorized to determine, in all cases, how far and in what instances it is the duty of masters and others having charge of vessels to accommodate each other, in their respective berths and situations.

41. Any master or other person having charge of any vessel, flat or raft, who shall refuse or neglect to obey the directions of the harbor master in any matter or matters within his authority, or shall molest, resist, or oppose the harbor master in the execution of any of the duties of his office, such master or other person, having charge of any vessel, flat or raft, or any person whatsoever, shall, upon conviction, of every such offense, forfeit and pay a sum not exceeding one hundred dollars.

42. That the owner or owners of any raft lying alongside of any wharf or wharves, or before the entrance of any public dock, his or their agent and servants, shall, upon notice from the harbor master, immediately remove the same and upon their failure or refusal so to do, it shall be the duty of the harbor master, and he is hereby authorized and directed after notice as aforesaid, to the owners thereof, their agents or servants, forthwith to cause all such rafts to be removed at the cost and expense of such owners or agent; and whenever in his judgment, it shall be necessary, he shall cast loose any such raft by untying or cutting the lines by which they are made fast.

43. The harbor master is authorized and instructed by the Board of Commissioners of Navigation and Pilotage to enforce the Rules, Regulations and Orders, as revised and adopted by the board on the 1st day of July, 1895.

And be it further ordained by the Board of Aldermen:

1. That the harbor master be required to keep the channel way and track of vessels clear; to berth vessels at appropriate wharves or docks; to change the berth of any vessel lying at such occupant's premises; it is made his duty to move such vessel to some other wharf, or to a safe anchorage in the stream. He is charged with the execution of any police regulations which may hereafter be adopted for the better government of the harbor.

2. That no flats or steamboats shall be put in any of the street docks to be repaired or grounded for the purpose of repair in any of the public docks, on the east side of the river, between Church Street Dock and Red Cross Street Dock.

3. Any person violating any of the provisions of the foregoing Rules, Regulations and Ordinances shall be fined twenty-five dollars, upon conviction, for each and every offense.

Adopted at a meeting of the Board of Aldermen held January 8th, 1900.

SOUTH CAROLINA.

PILOTS AND PILOTAGE.

Extracts from the Revised Statutes of South Carolina, 1893.

Sec. 1372. * * * vessels from certain ports to quarantine, it shall be the duty of every licensed pilot conducting any such vessel over the bar of any port to bring her to the quarantine ground, and to remain on board, or go to the quarantine station without coming up to the city or town until the port physician shall permit it. During the time for which any such pilot remains on board any such vessel or stays at the quarantine station he shall be allowed four dollars for each day of his remaining on board, or staying at the quarantine station as aforesaid, and be found in necessary provisions and accommodations at the expense of the master, owner or consignees of such vessel. * * * *

Sec. 1373. The pilot ground of the bar of Charleston † shall extend from the said bar thirty miles eastward, southward, and northward; and any master or commander of a vessel bearing toward any harbor or bar (all coasters and other vessels trading between any ports within this state excepted) who shall refuse to receive on board a licensed pilot for the said bar and harbor offering to board, shall be liable, on his arrival at the said port, to pay such pilot who first offered to go on board and take charge of such vessel the rates and fees allowed and established as hereinafter mentioned, as if such pilot had actually brought in such vessel to said port. But if a pilot having a ten or twelve foot branch or license only, as the case may be, is refused by the master of a vessel of greater draft, such master shall not be liable to him for her pilotage; and if a pilot refuse to produce his license to the master of a vessel when the latter demands it, the fees of pilotage shall not be charged against the master rejecting the services of such pilot.

Sec. 1374. Any pilot boarding a vessel on pilot ground shall be entitled to receive from the master, owner, or consignee four dollars for every day of his being on board previous to her coming into port in addition to the fees of pilotage. Every pilot of an inward bound vessel who shall be directed by the master to anchor in the roads, or is required by the quarantine laws to anchor and leave such vessel at the quarantine grounds and afterwards bring her up to the city, or town, shall be entitled to receive four dollars from the master, owner, or consignee; also, four dollars to bring a vessel anchored in the stream, at the request of the master, owner, or consignee, and moor her at the wharf; four dollars to unmoor, at the request of the master, owner, or consignee, and anchor in the stream, or from the stream to the roads, to be paid as aforesaid.

Sec. 1375. The pilot who brought in the vessel shall have the exclusive right of carrying her out, unless the master or commander of such vessel shall, within a fortnight after his arrival in port, prove to the satisfaction of the Board of Pilotage Commissioners, ‡ or a majority of them, that the said pilot had misbehaved during the time he had charge of such vessel, or unless the said pilot shall have been deprived of his license before the departure of such vessel, in either of which cases another pilot may be employed, who shall be entitled to receive the outward pilotage. * * * whenever a pilot having a right to carry out a vessel is apprehensive that his fees of pilotage may not be paid by her master, owner, or consignee, he shall have a right to demand them in advance, or such security for the payment thereof as shall be reasonable and satisfactory, and on failure thereof may refuse to carry her out.

Sec. 1377. Every master of an outward bound vessel shall, at the appointed time of his departure, have his vessel in readiness for sailing, and as a signal thereof hoist a jack at the fore-topmast head; and every master of a vessel who shall detain a pilot at the time appointed, so that he can not proceed to sea, though wind and weather should permit, shall pay to such pilot four dollars per day during the time of his actual detention on such vessel.

Sec. 1378. If any master or commander of a vessel shall carry off any of the pilots, he shall allow every such pilot four dollars for each and every day during his absence and supply him with provisions and other necessaries in the same manner as is usual for the maintenance and accommodation of masters of vessels, and the master, as well as the owner, consignee, and security of such vessel, shall be liable for the aforesaid sum: *Provided, however,* That no pilot who is so carried off shall be entitled to any of the sums aforesaid if such vessel shall have laid-to for the space of sixteen § hours after having crossed the bar and no pilot boat shall have appeared at the time to receive such pilot on board: but the master, owner or consignee shall defray the expenses of such pilot back to the port to which he may belong.

Sec. 1380. It shall be the duty of a licensed pilot, if required by the master or commander of a vessel, to remain on board while such vessel is anchored in the roads, outward bound, at the rate of four dollars per day; * * * *

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† A similar limit applies also to Georgetown; and St. Helena and Port Royal and adjacent waters.

‡ At Charleston the Board of Harbor Commissioners.

§ Twelve hours in the case of St. Helena and Port Royal and adjacent waters.

Sec. 1382. Whenever a vessel has crossed over or is inside of the bar the master shall not be compelled to take a pilot; but if he demands the services of a pilot he shall pay the customary fees of pilotage, as in other cases.

QUARANTINE.

Extracts from Revised Statutes of South Carolina, 1893.

Sec. 997. The anchorage ground for vessels at quarantine at the ports of Georgetown, Charleston and Hilton Head shall be designated by buoys, * * * ; and every vessel subject to quarantine shall, immediately upon her arrival, anchor within them, and there remain with all persons arriving on her, subject to the examination and regulations imposed by law. For the purpose of quarantine the port of Hilton Head shall be held to include the port of Beaufort. The quarantine anchorage for Port Royal Harbor shall be not less than one mile below and south of the mouth of Johnson's or St. Helena River.

Sec. 998. * * * every vessel arriving from a foreign port, or from a suspected or infected port of the United States, shall immediately proceed to the quarantine station of the port of arrival and display a yellow flag or the vessel's ensign in the rigging, and shall be visited by the Quarantine Officer, between sunrise and sunset, as soon as possible after such arrival. All vessels which have had infectious or contagious diseases on board during the voyage or while in the port of departure, and also all vessels from suspected or infected latitudes or ports, shall be subjected to a detention for such time as the constituted health authorities at the port of arrival may deem requisite, and pratique shall not be given to any such vessel until such vessel shall have been thoroughly disinfected and fumigated, the cargo and ballast having been first discharged, unless the constituted health authorities of the said port shall deem such disinfection, fumigation and discharge unnecessary.

Sec. 999. All vessels and persons remaining at quarantine on the first day of November shall thereafter be subject to such quarantine and restrictions as vessels and persons arriving on and after that day.

Sec. 1002. If any vessel arriving at the quarantine ground subject to quarantine shall be bound to some port north of either of said ports, the Quarantine Officer, after having duly visited and examined her, may permit her to pass on her voyage; but no such vessel shall be brought to anchor off either of said ports, nor shall any of her crew or passengers land in or hold any communication with either of said ports, or any person therefrom.

Sec. 1003. The master of every vessel released from quarantine and arriving at a wharf in either of said ports shall, within twenty-four hours after such release, deliver the permit of the Quarantine Officer at the office of the Mayor or Intendant, as the case may be.

Sec. 1004. Nothing in this Article shall prevent any vessel arriving at quarantine from again going to sea before breaking bulk.

Sec. 1011. Every vessel during her quarantine shall be designated by colors to be fixed in a conspicuous part of her main shrouds.

Sec. 1012. No vessel or boat shall pass through the range of vessels lying at quarantine, or land at the quarantine grounds, without the permission of the Quarantine Officer.

Sec. 1014. All persons being on board of vessels under quarantine shall be provided for by the master of the vessel in which they shall have arrived. If the master shall omit or refuse to provide for them, or they shall have been sent on shore by the Quarantine Officer, they shall be maintained at the expenses of such vessel, her owners, consignees, and each and every one of them. The Quarantine Officer shall not permit such vessel to leave quarantine until such expenses shall have been repaid or secured; and he shall have an action against such vessel, her owners and consignees, and each and every one of them, for such expenses which shall be a lien on such vessel, and as such may be enforced as other liens on vessels.

Sec. 1016. Any person aggrieved by any decision, order or direction of the Quarantine Officer may appeal therefrom to the Governor, Attorney-General and Comptroller-General, who shall constitute a Board of Appeal, * * * *

Sec. 1018. When the said Quarantine Officer, in the performance of his duties and in execution of the powers conferred upon him by law * * * the said Quarantine Officer shall have power to employ such persons and assistants as may be necessary to carry out and enforce such order or direction, and the persons so employed shall have a lien on such vessel, her tackle, apparel and furniture, for their services and expenses.

Sec. 1028. Any vessel which shall be restrained under laws and shall attempt to violate the same, may be fired upon, and detained by force of arms.

Sec. 1031. The following uniform schedule of charges is hereby adopted for quarantine dues for all ports of the state, * * * :

For every vessel boarded and inspected	$3.00
For every vessel of 100 tons or less, fumigating and disinfecting, each process	10.00
For every vessel over 100 tons and less than 250 tons, fumigating and disinfecting, each process	14.00
For every vessel over 250 tons and less than 500 tons, fumigating and disinfecting, each process	20.00
For every vessel over 500 tons and less than 750 tons, fumigating and disinfecting, each process	28.00
For every vessel over 750 tons and less than 1,000 tons, fumigating and disinfecting, each process	34.00
For every vessel over 1,000 tons and less than 1,250 tons	40.00
For every vessel over 1,250 tons, fumigating and disinfecting, according to tonnage of vessel, each process	$44.00 to 68.00

Except, that in every port in this state where the Holt System of Maritime Sanitation is in use the following charges shall be enforced, to wit:

INSPECTION FEES.

Every schooner or brig	$8.00
Every bark	10.00
Every steamship or ship	15.00

FUMIGATION AND DISINFECTION FEES.†

For every schooner, bark or brig under 500 tons	$50.00
For every schooner, bark or brig over 500 tons	60.00
For every steamship or ship under 1,000 tons	75.00
For every steamship or ship over 1,000 tons	100.00

In all cases the Quarantine Officer will collect the charges made against vessels, before giving permission to leave quarantine, either by Captain's draft on consignee or in currency, * * * .

(See also National Quarantines in Appendix IV.)

Extract from the Revised Criminal Statutes of South Carolina. Approved 1893.

Sec. 269. All masters of vessels, or other persons, violating the provisions of the quarantine laws of this state, or disobeying any of the published regulations of the health authorities of any port, and all persons whosoever who shall, without permission of said authorities, invade the quarantine grounds or station of such port, or who shall hold any communication, or attempt to hold any communication, with any vessel, or any officer, or any passenger, or any member of the crew, of any vessel lying at the quarantine, or under control of said authorities, shall be deemed guilty of a misdemeanor, and upon conviction shall be punished by a fine not exceeding two thousand dollars or by imprisonment not exceeding twelve months, or both, in the discretion of the court.

Sec. 270. Every master of a vessel subject to quarantine or visitation of the Health Officer, arriving in any of the ports of the state, who shall refuse or neglect to proceed with and anchor his vessel at the place assigned for quarantine; or to submit his vessel, cargo and passengers to the examination of the Health Officer, and to furnish all necessary information to enable that officer to determine to what length of quarantine and other regulations they ought, respectively, to be subject; or to remain with his vessel at quarantine during the period assigned for the quarantine, and while at quarantine to comply with the directions and regulations prescribed by law, shall be guilty of a misdemeanor, and be punished by fine not exceeding two thousand dollars, or by imprisonment not exceeding twelve months, or by both such fine and imprisonment.

Sec. 271. If a master of any vessel hailed by a pilot shall give false information to such pilot relative to the condition of his vessel, crew, or passengers, or of the health of the places from whence he came, or shall refuse to give such information as shall be lawfully required; or land any person from his vessel, or permit any person except a pilot to come on board his vessel; or unlade or tranship any portion of his cargo before his vessel shall have been visited and examined by the Health Officer; or shall approach nearer to the wharves of any port in this state than to the place of quarantine to which they may be directed, shall be guilty of a like offense, and subject to the like punishment, as in the preceding section.

† Not collected at present (1900) by the authorities at Charleston.

PORT OF GEORGETOWN.

Extracts from the Rules and Regulations of the Pilot Commissioners.

RATES OF PILOTAGE, PORT OF GEORGETOWN, S. C.

6	feet and under		$16.00	12	feet and under		$44.00
7	"		19.00	12½	"		48.00
8	"		23.00	13	"		54.00
9	"		26.00	13½	"		†60.00
10	"		28.00	14	"		†66.00
10½	"		31.00	14½	"		†72.00
11	"		38.00	15	"		†80.00
11½	"		40.00				

† New rates made by pilots pending the action of the legislature. See also extracts from Revised Statutes of South Carolina.

PORT OF CHARLESTON.

RATES OF PILOTAGE FOR CHARLESTON BAR AND HARBOR, INWARD OR OUTWARD.

6	feet or under		$15.00	17	feet or under		$92.00
7	"		16.50	17½	"		98.00
8	"		18.50	18	"		103.00
9	"		21.00	18½	"		108.00
10	"		28.50	19	"		115.00
11	"		33.00	19½	"		120.00
12	"		40.00	20	"		125.00
12½	"		44.00	20½	"		132.00
13	"		45.00	21	"		140.00
13½	"		50.00	21½	"		150.00
14	"		54.00	22	"		160.00
14½	"		60.00	22½	"		170.00
15	"		66.00	23	"		182.00
15½	"		69.00	23½	"		195.00
16	"		81.00	24	"		210.00
16½	"		87.00				

For taking a vessel around to Ashley River, if requested by the master, eight dollars; for taking letters from the city of Charleston to vessels outside the bar and waiting orders and delivering them on board, the amount of inward pilotage of such vessel's draft.

Extracts from the Laws, Rules and Regulations, relating to the Board of Harbor Commissioners for the Port of Charleston.

THE HARBOR MASTER.

1. It shall be the duty of the harbor master, in addition to such other duties as may be imposed on him from time to time, personally to see that all the regulations of this port, looking to the safety and convenience of the vessels arriving, remaining, and leaving the same, shall be properly observed and kept; * * *

2. His jurisdiction is concurrent over the harbor of Charleston and its tributaries within the radius of 5½ miles from southeast point of White Point Garden. He is required to keep the channel way and track of steamers clear. * * * He is charged with the execution of any police regulations which may hereafter be adopted for the better government of the harbor.

3. The master or consignee of any vessel wishing to move shall give the harbor master sufficient notice to enable him to give her a clear berth. The harbor master must be the judge of the time required.

4. The harbor master may remove any vessel or vessels moored to the ends of the wharves, or on either side of a dock, or lying in any part of a dock, which may be necessary, in his opinion, to expedite and render more safe and convenient the entrance or departure of any other vessel or vessels hauling at the time in or out of the said dock.

5. The harbor-master shall cut the fast or fasts of any vessel, or cause the same to be cut or cast loose, when the captain or person in charge of such vessel refuses or neglects to slack her fasts, and to remove his vessel for the proper accommodation of another vessel passing into or out of her berth; or who shall refuse to give up the inside berth, or to remove and moor his vessel in conformity with the foregoing regulations, or with the orders of the said harbor master.

6. Whenever the harbor master shall require the services of a tug to enforce an order for the removal of a vessel against the will of the master, the charge of the tug for such

service may be guaranteed to be paid by the board; but it shall be the duty of the harbor master to collect the costs, fines, and fees for such removal from the offending vessel by warrant in the name of the board. The harbor master will see that due notice of this section is served on the masters of all vessels.

7. Vessels when not engaged in loading or discharging cargo, shall give place to such vessels as are ready to receive or deliver freights. And if the captain or person in charge of any vessel refuse to move said vessel when notified by the owners or agents of the wharf at which she is lying, the harbor master shall order him to haul to some other berth, or into the stream; and should the captain or person in charge refuse to obey the orders of the harbor master, then the harbor master shall himself move the vessel at the owner's expense, by use of steam tug, if necessary, and shall be entitled to a fee of five dollars, to be recovered from the owners of the offending vessel.

8. The harbor master shall determine also how far and in what instances it is the duty of masters and others having charge of ships and vessels, to accommodate each other in their respective berths and situations.

9. The harbor master shall supervise the anchorage or mooring of vessels at this port, so as to prevent confusion and collision; and shall designate the wharves at which they may discharge their passengers and cargoes; and require their removal from the wharves when not thus engaged, so as to make room for other vessels.

10. All differences between the masters of vessels moored at the same wharf or in adjacent docks, and of vessels in the stream, with respect to the location and space occupied by their respective vessels, or the interfering with each other at their moorings, shall be referred to, adjusted, and settled by the harbor master upon proper representation thereof.

GENERAL RULES.

4. The harbor master has full authority, and he is hereby required so to regulate the manner in which a vessel shall lie at any of the public wharves, that the facilities for discharging and receiving cargoes may be afforded as generally as may be practicable, and as will best promote the public interest. Any person having charge of any vessel who shall refuse or neglect to obey the harbor master in carrying out this section shall forfeit and pay a fine of five dollars for each and every offense.

5. No vessel shall be permitted to anchor in the stream opposite the eastern part of the city, except northeastwardly of Merchant's Wharf (east end of Hasel street), and southeastwardly of Southern Wharves, and must at no time be at a less distance than one hundred fathoms from the head of the nearest wharf when she swings in next the city. Every pilot, before leaving any vessel which he shall have brought into port, shall give the master thereof timely notice respecting the anchorage of his vessel, and inform said master that he is liable to a fine not exceeding fifty dollars, if his vessel is anchored contrary to the foregoing rule. The captain of any tug, which shall have a vessel in tow, shall be held responsible if he anchor said vessel in the stream at any point prohibited by law.

6. No vessel having gunpowder, dynamite, or nitroglycerine, or any other explosive substance on board shall approach any wharf nearer than 100 fathoms. Such vessels shall anchor out of the way of passing steamers, and shall keep a red flag flying in main rigging while receiving or discharging powder. The handling of powder, dynamite, nitroglycerine, or any other explosive substance to and from vessels in the harbor must be under the supervision of the harbor master, whose duty it is to see that every precaution against danger of ignition or explosion is adopted and rigidly observed.

8. Every vessel lying in a dock or at the end of a wharf must have her yards "cock billed," and bumkins taken in (if removable). Such of the anchors as might interfere with vessels hauling past, or while lying in their berths, to be taken on board, or so placed as to be out of the way.

9. No vessel shall take or keep such a position in or near any dock as to prevent other vessels from getting in or out of the same.

10. No vessel shall take or keep a berth at any wharf, or in a dock, contrary to the harbor master's directions, he being vested with full power and authority to regulate and fix the berths of all vessels.

11. Every master or commander of a vessel, excepting regular lines of vessels trading within the limits of the State, is required by law to repair to the harbor master's office within 24 hours after his arrival, and there report the name, tonnage, and description of his vessel, the nation to which she belongs, and the name of the Pilot that brought her into port, and the number of his boat. And if any master or commander of any such vessel shall neglect to repair to the harbor master's office, or refuse or neglect to deliver to the harbor master the said report within the time above limited, he shall for each and every offense pay to the use of the Harbor Commissioners a sum not exceeding fifty dollars.

12. No ballast, stone, dirt, or rubbish shall be thrown from any vessel into the docks or stream. And every vessel landing or taking in ballast must use proper means to prevent any part of the same from falling into the dock.

13. Every vessel exceeding 25 tons register must always have on board a ship keeper or person capable of taking care of her.

14. No vessel shall be graved at any wharf or in any of the docks where vessels load or discharge.

15. Every vessel hauling past or lying alongside and made fast to another vessel shall put out in a proper manner good and sufficient fenders, and keep the same so placed as to prevent injury to the vessel she shall be alongside of; and shall likewise so place and keep her moorings as to prevent injury to the said vessel. And if discharging or taking in a cargo athwart another vessel's decks, she must also keep her plank or staging so fixed as not to cause injury.

16. That every ship, vessel, or steamer lying in one of the docks or moored to a wharf must keep a light burning on board thereof from dark until daylight; said light to be suspended conspicuously midships, fifteen feet above the deck of the vessel. The master, owner, or other person having charge of any ship, vessel, or steamer making default herein shall be liable to a penalty of five dollars for every offense.

FEES OR TAXES.

1. For the purpose of meeting the expenses attendant upon the execution of the foregoing regulations, and providing for the safety and proper accommodation of vessels at this port, the following tax or fee is imposed upon all vessels arriving here, and will be collected by the harbor master upon their arrival in such manner as shall be most expeditious:

Coastwise steamships, monthly	$6.00
Schooners, per trip	2.00
Brigs, per trip	2.50
Foreign steamships, per trip	12.00
Barks, per trip	6.00
Brigs, per trip	3.00

ST. HELENA, PORT ROYAL, AND ADJACENT WATERS.

RATES OF PILOTAGE.

Feet.	Pilotage.	Feet.	Pilotage.	Feet.	Pilotage.	Feet.	Pilotage.
6	$18.00	14	$55.00	18½	$112.00	23	$190.50
7	21.00	14½	60.00	19	120.00	23½	201.00
8	24.00	15	66.00	19½	128.00	24	212.00
9	27.00	15½	71.00	20	136.50	24½	223.00
10	31.00	16	76.50	20½	143.50	25	235.00
11	35.00	16½	82.50	21	152.50	25½	249.00
12	40.00	17	89.00	21½	161.50	26	264.00
12½	43.50	17½	97.00	22	170.50	26½	280.00
13	47.00	18	104.50	22½	180.00	27	297.00
13½	51.00						

The terminus of the pilot station is between Black Buoy No. 1 and Bug Light.† Masters of outward bound vessels are also notified that the former practice existing of hoisting their flag for a pilot at the loading place is to be discontinued.

That the rates of pilotage for Port Royal and St. Helena bars be applied to Calabogue Sound, and all river pilotage be abolished except for each drop ten dollars, and each day's detention four dollars, and if pilot is required to dock vessel he is entitled to four dollars for same.

PORT REGULATIONS, PORT ROYAL, S. C.

1. Every pilot when he has brought any ship or vessel to anchor, is required to moor such ship or vessel, or to give proper directions for the mooring of the same, and for her safe riding at such mooring. He shall also make known to the captain of such vessel the law requiring lights on board, as well as inform him of his duty to report his arrival at the harbor master's office within four hours of the same.

2. All masters of vessels, when deemed necessary by the harbor master shall rig in their jib boom, and all vessels top their lower and topsail yards, take in their bowkins and davits, lay their spritsail yards fore and aft, rig in their martingale, take in all boom irons, and cockbill their anchors. These regulations must be observed while lying at the wharf, or at anchor in any part of the river.

3. No anchor is allowed in the river when the vessel is made fast to the wharf.

4. All vessels except regular packets, in ballast waiting for freights, lights, or occasionally taking in, discharging, or retailing a cargo at any wharf, shall give the inside berth to a loaded vessel that wants to discharge forthwith, and every such vessel shall likewise give

† In St. Helena Sound.

the inside berth to a vessel that wants to take on board her cargo immediately. Any vessel, except regular packets, taking in cargo at the wharf, shall give the inside berth to a loaded vessel, if at the time of application for such berth, there is no other vacant suitable berth for such loaded vessel.

5. Every vessel hauling past, or lying alongside, and made fast to another vessel, shall put out in a proper manner good and sufficient fenders, and keep the same so placed as to prevent injury to the vessel she shall be alongside of, and shall likewise so place her moorings as to prevent injury to said vessel. And, if discharging or taking in a cargo athwart another vessel's deck, she must also keep her plank or staging so fixed as not to cause injury.

6. Masters of vessels shall not permit ballast, rubbish, or dirt of any kind, to be thrown into the river or harbor. All ballast and coal shall be thrown ten feet back, clear of the wharf. A sail or tarpaulin must be put between the vessel and the wharf, extending under and five feet on each side of the stage, to prevent any from falling into the river. The sweepings of the decks, ashes from the caboose, and rubbish of any kind, must be put upon the wharf and carted away.

7. No vessel while lying alongside the wharf, or another vessel, shall be smoked for the purpose of destroying rats, but must first be hauled into the stream, and kept constantly afloat, so as to be easily removed in case of taking fire.

8. No tar, pitch or turpentine shall be boiled on any vessel's deck, or within sixty yards of any vessel, wharf or warehouse.

9. Any vessel will be admitted to a berth, or be allowed to change from one to another, on application to the harbor master.

10. Any master, or other person having charge of any ship or vessel, who shall refuse or neglect to obey the directions of the harbor master in any matter or matters within his authority, or shall molest, resist or oppose the harbor master in the execution of any of the duties of his office, such master or other person having charge of any ship or vessel, or any person whatsoever, shall, upon conviction, for every such offense forfeit and pay the sum of thirty dollars.

11. The master of any vessel, being at anchor in any part of the river in the night time, shall cause a good and sufficient light to be shown in some part of the rigging of said vessel, at least twenty feet above the deck, which light shall be kept burning during all hours of the night.

12. Every vessel must always have on board a ship-keeper or other person capable to take charge of her.

13. In case of any dispute or difference of opinion, arising between or amongst masters of vessels, or others concerned under the foregoing harbor regulations, the same shall be settled by the arbitration of the harbor master, on the application to him of those interested.

14. No vessel lying at the wharf shall be allowed to keep her sails loose in windy or threatening weather, so as to endanger her own safety or the safety of other vessels near her.

15. All pilot boats and small vessels shall anchor between lumber wharf and Printup's wharf, on Battery River, and such vessels shall not anchor anywhere opposite the town where they may interfere with the commerce of the port.

16. Vessels arriving at this port, and anchoring opposite the town, must anchor so as to leave a clear passage for vessels arriving and departing. All parties violating these rules shall be liable upon conviction for every such offense, to forfeit and pay the sum of thirty dollars.

17. All penalties, fines, or forfeitures under any of the foregoing rules, shall upon conviction before the intendant's court, be collected in the usual manner, and be paid into the treasury of the town for the use of the town, the harbor master to be considered in all cases a full and competent witness against all offenders.

18. The harbor master has the right to make such other regulations as circumstances may require.

All smoking on the wharves prohibited.

GEORGIA.

PILOTAGE.

Extract from Code of Georgia, adopted December 15, 1895. Chapter 6.

Sec. 1653. *Licensing of pilots.*—* * *. No person other than a duly licensed pilot shall be entitled to receive any fee, gratuity, or reward for conducting or piloting any vessel inward to or outward from any of the ports, rivers, or harbors for which a pilot shall be licensed. * * * if any person interferes with or disturbs a licensed pilot in any way of his duty, such person may, on conviction, be fined and imprisoned, at the discretion of any court having jurisdiction; but any person may assist a vessel in distress without any pilot on board, if such person shall deliver up the vessel to the first pilot who comes on

board and offers to conduct it, but the vessel must fly the signal for a pilot until one has been received or his services tendered.

Sec. 1655. Rules, regulations and fees.—* * *. The commissioners shall have power, and it is their duty, to prescribe rules and regulations for the government of pilots, and to prescribe the fees for their services, and they may also impose such penalties not inconsistent with this law for neglect of duty or for a violation of the orders or of the rules and regulations of the commissioners, as they may think proper. * * *. They shall exempt vessels from the payment of pilotage fees, either inward or outward, unless services are tendered outside the bar, and exempt from the payment of outward pilotage fees coastwise vessels changing ports by inside routes, either in changing ports or by going to sea after having changed ports by inside route, unless a pilot is actually employed. They shall allow vessels running coastwise under United States license to pay, after paying the inward pilotage for that trip an annual license fee of twenty-five cents per registered ton, which shall belong to the pilot entitled to the inward pilotage fee, and the payment of said license fee shall exempt at that port said vessel for twelve months thereafter from compulsory employment of a pilot either inward or outward, or payment therefor unless services of a pilot are accepted; licenses shall be renewed to vessels after having arrived in port, and if they approach the port after the expiration of a former license, the license shall be granted only after they have paid the inward pilotage for that trip if service has been tendered outside the bar; and any vessel, while in a port for which she has had a license, may within ninety days after the expiration of said license make application for and on payment of the license fee shall receive a new license for twelve months from the date of the expiration of the old license. They shall allow half the regular pilotage fees to be collected from all vessels except those exempt by the laws of the United States or licensed as provided for in this chapter calling at the bar of any of the before-named ports or rivers in ballast seeking or for orders if they do not load but leave in ballast, and allow half the regular pilotage fees, both inward and outward, on all vessels returning to the port at which they loaded, before completing the voyage, from stress of weather or from being damaged or disabled; but vessels subject to go into quarantine shall pay full pilotage fees inward and outward.

Sec. 1656. Vessel refusing to take pilot.—* * *. Any person, master, or commander of a ship or vessel except vessels exempt by United States laws, and vessels while licensed under the provisions of this Article, and vessels of less than one hundred tons burden bearing toward any of the ports, rivers, or harbors of this state, and who refuses to receive a pilot on board, shall be liable, on his arrival in such port, river, or harbor in this state, to pay the first pilot who may have offered his services outside the bar, and exhibited his license as a pilot if demanded by the master, the full rates of pilotage, inward and outward, established by law for such vessel.

Sec. 1657. Pilot bringing in may take out.—* * *. The pilot who brings a vessel into port, or one attached to his pilot boat, shall have the exclusive right to take her out, unless the master of such vessel shall prove to the satisfaction of the commissioners that such pilot misbehaved himself while in charge of the vessel, or was in the meantime deprived of his license, or that such pilot had obtained the inward pilotage against the right of some other pilot first offering his services, and in any of these cases another pilot shall be employed, and in that event the outward pilotage fees shall belong to the pilot who takes her out.

Sec. 1658. Mooring and docking.—* * *. Every pilot in any of the ports, rivers, or harbors aforesaid, bringing any vessel to anchor in any of said ports, rivers, or harbors, shall moor such vessel, or give proper directions for the mooring of the same and the safe-riding thereof, or shall dock such vessel if required by the master on his arrival, and said pilot shall not be entitled to compensation in addition to his pilotage fees for so doing.

Sec. 1659. Collection of fees.—* * *. A pilot bringing a vessel into port, or who has tendered his services to her outside the bar, unless his services have been refused because of her being licensed, as hereinbefore provided, shall be entitled to his fees, both inward and outward, before her departure from port, to be paid in advance, or security given for the payment, and on failure thereof he may refuse to carry the vessel out, and all fees for pilotage may be demanded and recovered, in any court having jurisdiction from the owner, master, or consignee of the vessel; and if any licensed pilot shall ask or demand more fees for his services than are specified in the rates of pilotage, on due proof thereof, before the commissioners, he shall forfeit double the amount of such vessel's pilotage.

Sec. 1660. Delivering letters.—* * *. Whenever a vessel shall touch off the bar of any of the ports, rivers, or harbors of this state for instructions, any pilot delivering on board such vessel any letters or orders, shall be allowed one-half of the bar pilotage in and out.

Sec. 1665. Rights and duties of pilots.— * * * if any master or owner of any vessel in port employ any other pilot to carry his vessel down the river, or to sea, but the pilot who brought her in, or one belonging to the same boat, unless good and sufficient cause shall appear therefor, he shall be liable to a fine not exceeding one hundred dollars—one-half to the pilot lawfully claiming the pilotage of the vessel; * * *

Sec. 1666. Pilots to be notified of vessel's departure.—The master of a vessel in readiness to leave must, if practicable, give notice to the pilot entitled to conduct the vessel out, of

his intention to leave, or to some other pilot belonging to the same boat; *Provided*, such pilot be at the place of departure of such vessel, or near thereto.

Sec. 1667. *Penalty for carrying off or detaining pilot.*—The owner, master or consignee of any vessel carrying off any pilot of such vessel, and against his consent, to any port, either foreign or on the coast, shall be liable to such pilot, in action on the case, for the payment of all reasonable expenses, and for the further sum of not exceeding three dollars a day, during the necessary absence of the pilot; *Provided*, the carrying away of such pilot be not owing to any default, misconduct or negligence on his part; and the master of a vessel detaining a pilot on board his vessel, the wind and weather permitting him to go to sea, shall be liable to pay such pilot three dollars a day for every day he is so detained.

Sec. 1669. *Pilot fees for carrying vessel to another port.*—Any pilot belonging to any port in this state, meeting at sea with any vessel bound to another port within the same, shall, if capable and thereunto required, take charge of and pilot such vessel into such port, and shall be paid two dollars per day, for every day such pilot may be on board such vessel at sea without the bars, over and above the usual rate of pilotage, and no other pilot shall interfere while the former is willing to continue his service.

Sec. 1670. *Default of pilot, how punished.*—If any vessel whatsoever, or the cargo or freight thereof, shall receive any damage or miscarriage, or be lost through the negligence or default of any pilot, after such pilot takes charge of the same, and the claim exceeds one hundred dollars, the said pilot shall, in such case, on conviction thereof before any court of record in this state, be obliged to answer and make good to the sufferers, or the master of said vessel, all and every the damages he shall sustain thereby.

Sec. 1671. *Other cases of damages, how settled.*—All other cases of damage or difference that may arise or be made against any master or pilot, for or concerning the pilotage of any vessel, or any other matter relative to the business or care of a pilot, in any of said harbors, shall be heard and determined by the commissioners, or a majority of them * * * * *

HARBOR CONTROL.

Extract from the Code of Georgia, 1895.

Sec. 1537. *Penalty for discharging ballast in harbor.*—If any master of a vessel, or water-craft of any description, shall throw, or permit to be thrown from on board such vessel or water-craft, into any of the waters of any bay or harbor of this state, or within three miles of the outside bar of any such bay or harbor, any stone, gravel, or other ballast, he shall forfeit a sum not less than five hundred dollars nor more than two thousand dollars for any such offense, and may be imprisoned not exceeding three months, at the discretion of the court—one-half the forfeiture to be paid to any one first giving information of the offense to the commissioners, and the other half to the use of the commissioners of said harbors, respectively, for improvement of navigation.

QUARANTINE.

Extract from the Code of Georgia, 1895.†

Sec. 1458. *Quarantine, how prescribed and regulated.*—The corporate authorities of such town may, from time to time, prescribe the quarantine to be observed by all vessels arriving within the harbor or vicinity of each town, and the regulations therefor, not contrary to law; * * *.

Sec. 1459. * * * and the jurisdiction of the corporation of Savannah shall in cases of quarantine extend to all ships and vessels which shall enter at any port or inlet from Ossabaw Sound to Tybee, and the jurisdiction of the corporation of Darien shall, in cases of quarantine, extend to all ships and vessels which shall enter any port or inlet from St. Catherines to Doboy Sound, and the jurisdiction of the corporation of Brunswick shall, in cases of quarantine, extend to all ships and vessels which shall enter any port or inlet from Altamaha Sound to St. Andrew Sound, and the jurisdiction of the corporation of St. Marys shall, in cases of quarantine, extend to all ships and vessels which shall enter any port or inlet from Cumberland Sound to St. Marys River, including all inlets, rivers, and creeks within those limits.

Sec. 1460. *Vessels may be removed to quarantine ground.*—The Health Officer or visiting physician of such town may, under the direction of the corporate authorities, cause any vessel arriving therein, or in the vicinity, if the vessel or cargo is in his opinion so foul or infected as to endanger the public health, to be removed to the quarantine ground, or other proper place, to be inspected.

Sec. 1462. *Masters of vessels must deliver bill of health, etc.*—The master of any vessel ordered to perform quarantine shall deliver to the officer appointed to see it performed his bill of health and manifest, log book and journal.

Sec. 1464. *Duty of pilots before entering vessels.*—It shall be the duty of any pilot, before entering on board of any vessel, to make strict inquiry of every master or commander of

† There are National Quarantine Stations at Savannah, Sapelo Sound, and Brunswick, Ga.; see also National Quarantine Regulations in Appendix IV.

the same as to the state of health in such vessel, * * * and any master or commander refusing to answer any such reasonable inquiry, or giving false information in answer, may be fined in a sum not exceeding five hundred dollars.

Sec. 1465. Persons on board of vessels shall observe quarantine.—No person on board such ship or vessel in which such disease shall exist, or whilst such ship or vessel is performing quarantine, shall come or be permitted to come on shore or land from such vessel without permission from the proper authority, under the penalty of fine and imprisonment at the discretion of the court, * * *.

Sec. 1470. Performance of quarantine, how certified.—It shall be the duty of the health officer of any port, or the authorized visiting physician thereof, after a vessel shall have duly performed quarantine, to give a certificate thereof to the master or commander, * * * * the fee for such certificate shall be two dollars for every vessel of more than two hundred tons, and one dollar for every vessel of not more than two hundred tons.

Sec. 1471. Fees of health officer, how paid.—For visiting any vessel when required, and granting a certificate of the health of the crew and passengers on board, the fee of the health officer or visiting physician, to be paid by the master of such vessel before she shall be permitted to enter, shall be two dollars; coasting vessels coming from one inlet in the state to another inlet in the same, excepted.

PORT OF SAVANNAH.

Extracts from the Permanent Rules of the Commissioners of Pilotage.†

1. The master, owner or consignee of any ship or vessel requiring a pilot shall give twenty-four hours' notice thereof in writing, in the book kept for that purpose, at the place designated by the Commissioners of Pilotage.

3. Whenever a pilot is directed or required by the master or commanding officer of any vessel he has in charge, to bring to in any part of the river, to wait for a boat or any other transient purpose that has no relation to the trim of the vessel, or to her lading, the same shall be reckoned as detention only, and compensation claimed under rule 9.

7. The Bar and Cockspur pilotage is not to be demanded or paid, until the vessel be boarded by a pilot without the bar, but any pilot bringing a vessel from sea to safe anchorage within the bar shall receive the full Bar and Cockspur pilotage.

8. Whenever any ship or vessel shall touch off the bar of Tybee for instructions, all pilots delivering on board said ship or vessel any letters or orders, shall be allowed full Bar and Cockspur pilotage, in or out.

9. For every day's detention of the pilot on board any vessel to the leeward of the bar, four dollars and thirty-two cents per day after the first twenty-four hours, provided such vessel was boarded to the leeward of the bar, and not more than thirty miles from the bar; if boarded at a greater distance, detention not to be paid until the vessel is within that distance.

10. For every day's detention of a pilot of a vessel riding quarantine, four dollars and thirty-two cents per day.

11. For every day's detention of the pilot of any ship or vessel in town, or in the river, after twenty-four hours' notice being given by the captain of said vessel, four dollars and thirty-two cents.

12. The following rates are established for moving vessels, for completing their loading, and other purposes:

Draft in feet.	Savannah to Tybee or Tybee to Savannah.	Savannah to Venus Point or Venus Point to Savannah.	Savannah to Four Mile Point or Four Mile Point to Savannah.	Savannah to Five Fathoms or Five Fathoms to Savannah.
6	$8.00	$8.00	$6.00	$4.00
7	8.00	8.00	6.00	4.00
8	8.00	8.00	6.00	4.00
9	10.00	10.00	8.00	6.00
10	10.00	10.00	8.00	6.00
11	11.00	11.00	10.00	8.00
12	11.00	11.00	10.00	8.00
13	12.00	11.00	10.00	8.00
14	14.00	14.00	12.00	10.00
15	17.00	15.00	13.00	10.00
16 and up.	18.00	16.00	14.00	12.00

From Tybee to Venus Point same as from Venus Point to Savannah.
From Tybee to Four Mile Point same as from Savannah to Venus Point.
From Venus Point to Four Mile Point same as from Four Mile Point to Savannah.
Quarantine to Savannah same as from Tybee to Savannah.
Detention per day $4.32.

† Revised 1891.

And all vessels bound up or down the river, and detained one tide, to alter the trim of the vessel, to pay the pilot a drop of seven dollars and fifty cents, but no detention for that day.

13. All pilots bringing a vessel safe from sea, have a preference of carrying said vessel up and down the river and to sea again, provided they give their attendance two hours before high water, and are duly qualified; * * * and no pilot shall be entitled to demand the inward pilotage of any vessel until the outward pilotage of the same shall be due, provided such vessel does not remain more than sixty days in port after the discharge of her inward pilot; but pilots may in all cases require security for the payment of the whole pilotage before the vessel proceeds to sea.

14. Any master, owner, or consignee of any vessel in the port, who shall employ any other pilot to carry said vessel down the river and to sea, but the pilot who brought the vessel in, or one belonging to the same boat (unless good and sufficient cause shall appear for the contrary), shall pay double the amount of said vessels pilotage, half for the use of the boat that brought said vessel from sea; * * *

16. That hereafter in all cases where masters of vessels follow a pilot boat in over the bar or up to the city, in cases where there is no pilot in the boat to board the vessel, said boat shall be entitled to half pilotage of said vesel; and also in case of one vessel following another which has a pilot on board, if said pilot shortens sail or in any other matters so conduct his vessel as to be a guide to the following vessel, then such pilot shall de entitled to half pilotage of such vessel so advantaged.

22. It shall be the duty of pilots during the two hours before high water, which attendance is required by law, to go on board vessels ready for sea, and assist in unmooring and preparing for sea, whether from the wharf or otherwise—and to get the vessel under way at any time when the master may so desire; and also to take vessels ready for sea from any of the sawmills as far up the river as the Ocean Steamship Company's wharves—without extra pay: *Provided,* That the pilots be held harmless from all damage until the vessel is in the stream.

RATES OF PILOTAGE FOR TYBEE BAR AND SAVANNAH RIVER.

Draft.	Bar Pilotage and to Cockspur.	From Cockspur to Savannah.	Total amount.
6 feet and under	$10.76	$6.46	$17.22
7 " "	13.06	7.83	20.89
8 " "	14.83	8.89	23.72
9 " "	16.69	10.01	26.70
10 " "	21.08	12 64	33.72
11 " "	25.55	15.33	40.88
12 " "	28.58	17.14	45.72
12½ " "	30.30	18.18	48.48
13 " "	31.84	19.11	50.95
13½ " "	34.15	20.49	54.64
14 " "	38.91	23.35	62.26
14½ " "	42.74	25.64	68.38
15 " "	45.08	27.04	72.12
15½ " "	47.17	28.30	75.47
16 " "	50.32	30.19	80.51
16½ " "	54.13	32.48	86.61
17 " "	57.34	34.41	91.75
17½ " "	61.02	36.72	97.74
18 " "	64.05	38.55	102.60
18½ " "	67.17	40.34	107.51
19 " "	71.72	43.04	114.76
19½ " "	74.96	44.99	119.95
20 " "	78.30	46.98	125.28
20½ " "	82.81	49.69	132.50
21 " "	87.50	52.50	140.00
21½ " "	93.75	56.25	150.00
22 " "	100.00	60.00	160.00
22½ " "	106.25	63.75	170.00
23 " "	114.06	68.44	182.50
23½ " "	121.88	73.12	195.00
24 " "	131.25	78.75	210.00

Extracts from the Harbor Regulations.

1. Every pilot, when he has brought any ship or vessel to anchor, is required to moor such ship or vessel, or to give proper directions for the mooring of the same and for her safe riding at such mooring. He shall also make known to the captain of such vessel the laws requiring lights on board.

2. It shall be the duty of every pilot to inform the masters of vessels of their duty to report to the harbor master's office within twenty-four hours after arrival at city.

3. Pilots are directed to moor all vessels which stop at Five Fathom to lighten or discharge, as near the south shore as may be safe, that an open passage may be left to the northward for vessels to pass and repass. No vessel shall discharge or load any of her cargo in the river opposite the city, except at the wharves. No anchor is allowed in the river when the vessel is made fast to the wharf.

4. All masters of vessels, as soon as they come to anchor shall rig in their jib-boom, spanker-boom, and main-boom; and all vessels shall brace their lower and topsail yards on the starboard braces, take in the boomkins and davits, lay their spritsail yards fore and aft, rig in their martingale, take in all boom irons, and cock-bill their anchors. These regulations must be observed while lying at the wharf, or at anchor in any part of the river. The master of any vessel, or his representative refusing to move his vessel when ordered to do so by the harbor master or deputy, the vessel shall be moved, if necessary, with tug or tugs, and proper crew employed, at expense of said vessel.

5. Master or consignee of any vessel wishing to move shall give the harbor master sufficient notice to enable him to give her a clean berth. The harbor master must be the judge of the time required.

6. No vessel shall be moved, after being placed at the wharf, without permission of the harbor master.

7. No vessel, other than regular packets, arriving at the city, shall be docked without permission of the harbor master.

8. No vessel whatever shall be permitted to lie in the river before the city longer than twenty-four hours, inward or outward bound (powder vessels excepted). Vessels having powder on board, the pilot shall bring to anchor as near the fort wharf as they may have water to lie in at low water, and the master must land his powder in twenty-four hours after anchoring, and place it in the magazine, the officer of which is to receive the same and give a receipt therefor, except vessels having on board powder destined for the interior, either by railroad or river, such vessel may haul alongside any vacant wharf, and the powder on board shall be moved direct from the vessel to the depot or boat immediately after she is made fast to the wharf.

9. All vessels, except regular packets, in ballast, waiting for freight, light, or occasionally taking in, discharging or retailing a cargo, at any wharf, shall give the inside berth to a loaded vessel that wants to discharge forthwith; and every such vessel shall likewise give inside berth to a vessel that wants to take on her cargo immediately. Any vessel, except regular packets, taking in a cargo at any wharf, shall give the inside berth to a loaded vessel, if, at the time of application for such berth, there be no other vacant or equally suitable berth for such loaded vessel.

10. Every vessel hauling past or lying alongside and making fast to another vessel shall put out, in a proper manner, good and sufficient fenders, and keep the same so placed as to prevent injury to the vessel she may be alongside of, and shall likewise so place her moorings as to prevent injury to said vessel, and if discharging or taking in cargo athwart another vessel's deck, she must also keep her plank or staging so fixed as not to cause injury.

11. Masters of vessels shall not permit ballast, rubbish, or dirt of any kind to be thrown into the river or harbor. All ballast or coal shall be thrown ten feet back, clear of the heads of the wharves; a heavy sail or tarpaulin must be put between the vessel and the wharf, extending under and 5 feet on each side of the stage, to prevent any from falling into the river. The sweepings from the deck, or ashes from the caboose or rubbish of any kind must be put upon the wharf and carted away.

12. No vessel while lying alongside the wharf or another vessel, shall be smoked for the purpose of destroying rats, but must be first hauled in the stream and kept constantly afloat so as to be easily removed in case of taking fire.

13. No tar, pitch, or turpentine shall be boiled on any vessel's deck, or within sixty yards of any vessel or warehouse. Notice in all cases to be given to the harbor master.

15. No vessel lying at any of the wharves on the southern side of the river between Habersham's Mill and the eastern extremity of the city, shall be permitted to take on board any timber or lumber from rafts alongside, unless the owner or lessee of the wharf at which the vessel lies shall consent thereto, and procure the consent of the owner or lessee of the adjacent wharves, which consent shall be in writing and filed with harbor master. In cases where it would not be safe to remove empty vessels, the mayor will give permission to load a few sticks of timber at wharf, said sticks to be secured by chains and dogs after the raft shall have been broken up.

17. Not more than two vessels of one hundred tons or more register shall be allowed to lay alongside at any wharf in the city so long as there shall be another wharf vacant, or with only one vessel thereat, except under special permit from the harbor master, approved by the mayor.

18. No vessel or boat lying alongside of any other vessel or wharf shall have a fire in the caboose, or any other place on or under deck of said vessel or boat, except in an iron caboose, and such caboose or other fireplace be well and safely covered and surrounded with a good and sufficient caboose house, hut, or other covering or inclosure.

19. All vessels overlaying the city wharves and docks must pay proportional wharfage. No rafts shall be kept across or in them for the purpose of loading, except by permission.

20. No shingle or sand ballast, or rubbish of any description, shall be landed without permission of the harbor master.

21. Any vessel will be admitted to a berth or be allowed to change from one berth to another on application to the harbor master.

22. No master or other person having charge of any ship or vessel shall refuse or neglect to obey the directions of the harbor master, or his assistant, in any matter or matters within his or their authority, or shall molest, resist or oppose the harbor master, or his assistant, in the execution of any of the duties of his or their office.

23. The master of any vessel lying at anchor in any part of the river at night time, shall cause a good and sufficient light to be shown in some part of the rigging of such vessel, at least 20 feet above her deck, which light shall be kept burning during all hours of the night.

24. Every vessel must always have on board a shipkeeper, or other person capable to take charge of her.

25. In case of any dispute or difference of opinion arising between or among masters of vessels, or others concerned under the foregoing Harbor Regulations, the same should be settled by the arbitration of the harbor master, on the application to him of those interested.

Sec. 2. And it is hereby further ordained by the authority aforesaid, that any person violating any of the regulations contained in the foregoing sections, upon conviction thereof in the police court, shall be fined in a sum not exceeding one hundred dollars, or be imprisoned not more than thirty days, either or both, in the discretion of the officer presiding in said court.

To provide for the sleeping ashore of the crews of vessels.

Sec. 1. Be it ordained by the mayor and alderman of the city of Savannah in council assembled, and is hereby ordained by the authority of the same, That the crews of all vessels lying in the Savannah River from June 1 to November 1 in every year shall sleep on shore south of River Street, and it is the duty of the masters of all vessels to see that this regulation is carried out by their respective crews.

Sec. 2. Be it further ordained, That any person or persons violating any of the provisions of this ordinance shall, on conviction before the police court, be fined a sum not to exceed one hundred dollars or imprisonment not more than thirty days, either or both at the discretion of the officer presiding in the police court.

Relating to the speed of vessels and smoking.

No steamer shall, while passing along the line of the wharves of the city, exceed in speed four miles an hour; and where two or more vessels are moored abreast of any of said wharves, the steamer passing will stop her engine and turn "over slow," using every precaution to avoid unnecessary suction, until the vessels in her immediate vicinity are passed by. In passing near the dredge and dredge flats employed at any point on the river between the western limits of the city and Tybee, steamers must be slowed down, and, where necessary, stopped and worked as above specified, until the dredge or flats are passed.

No steamer while passing line of the quarantine wharves opposite the eastern end of Long Island, shall exceed a speed of five miles per hour.

It shall not be lawful for any person to smoke any pipe, cigar, cigarette, or tobacco, ignited in any way by fire, upon any of the wharves in the city of Savannah, where any vessel or vessels are loading or unloading cotton, naval stores, hay, oil, or other inflammable merchandise, or where cotton, naval stores, hay, oil, or other inflammable merchandise is stored, or in any of the railroad depots or yards in said city where cotton, naval stores, hay, oil, or other inflammable merchandise is stored temporarily or permanently.

It shall not be lawful for any person on board of any tug, lighter, steamer, vessel, or other craft engaged in loading, unloading, or transshipping cotton or other inflammable merchandise while laying at any wharf in the city of Savannah, or while laying in or navigating said Savannah River, or other waters within the jurisdictional limits aforesaid, to smoke any cigar, cigarette, pipe, or other ignited substance.

HARBOR FEES.

The harbor fees, as established by ordinance, shall be as follows: By each transient brig or schooner, $4.00; by each transient ship or bark, $6.00; by each transient steamship, $15.00; by each coastwise steamship running regularly to this port, $6.00 per month; by each bark, barkentine, brig, or schooner, engaged in the coastwise trade, $4.00, payable not more than twice in twelve months. By each sailing vessel or steamer, plying inland, measuring forty feet or more, 2 cents per foot over-all measurement, payable quarterly in advance.

PORT OF DARIEN.

Extracts from the Permanent Rules and Regulations for the Government of Pilots in the Port of Darien. †

Rule 7. Any pilot speaking a vessel outside the bar shall be entitled to inward and outward pilotage of said vessel, whether his services are accepted or not. The bar pilotage is not to be demanded or paid unless the vessel is boarded by a pilot without the bar; but any pilot boarding a vessel within the bar and bringing said vessel to a safe anchorage agreeable to the orders of the commanding officer of said vessel shall receive river pilotage; and if the master requires a pilot out, he shall be entitled to the vessel.

Rule 8. Whenever any ship or vessel shall touch off the bar of Doboy or Sapelo for instructions, any pilot delivering on board said ship or vessel any letters or orders shall be allowed full bar pilotage in and out.

Rule 9. For every day's detention of the pilot on board any vessel to the leeward of the bar he shall receive three dollars per day after the first twenty-four hours, provided such vessel was boarded to leeward of the bar, and not more than thirty miles from the bar. If boarded at a greater distance, detention not to be paid until the vessel is within that distance.

Rule 10. For every day's detention of the pilot of any vessel riding quarantine he shall receive five dollars per day, to be paid by the vessel.

Rule 11. For every day's detention of the pilot of any ship or vessel in town or in river after twenty-four hours' notice being given by the captain of said vessel, he shall receive three dollars per day, to be paid by the vessel.

Rule 12. All pilots bringing a vessel safe from sea have preference of carrying said vessel up and down the river and to sea again, provided they give their attendance two hours before high water, and are duly qualified * * *. Pilots may in all cases require security for the payment of the whole pilotage before the vessel proceeds to sea.

Rule 13. Any master, owner, or consignee of any vessel in the port who shall employ any other pilot to carry said vessel down river and to sea but the pilot who brought the vessel in, or one belonging to the same boat (unless good and sufficient cause shall appear for the contrary), shall pay double the amount of said vessel's pilotage, half for the use of the boat that brought said vessel from sea. And every pilot acting on board any such vessel when he has no right shall be deemed liable to the same penalty.

Rule 15. That hereafter, in all cases where masters of vessels follow a pilot in over the bar or up to the city, in cases where there is no pilot in the boat to board the vessel, said boat shall be entitled to half pilotage of said vessel; and also in cases of one vessel following another which has a pilot on board, if said pilot shorten sail or in other manner so conduct his vessel as to be a guide to the following vessel, then such pilot shall be entitled to half pilotage of such vessel so advantaged. No pilot shall be entitled to board such vessel following pilot boat or vessel in after she has passed Wolf Island Spit Buoy, unless said pilot belongs to the said boat.

Rule 17. Vessels towing from adjacent ports, by inside route, shall not be compelled to take a pilot.

Rule 20.—Every pilot when he has brought any ship or vessel to anchor in the harbor shall (and he is hereby directed and required to) moor said ship or vessel, or give proper directions for the mooring of the same, and for their safe riding at such mooring.

Rule 21.—It shall be the duty of pilots, during two hours before high water, which attendance is required by law, to go on board vessels prepared for sea, and assist in unmooring and preparing for sea, whether from wharf or otherwise, and to get the vessel under way at any time the master may so desire.

Rule 30.—Vessels dropping from quarantine to ballast or loading ground, or, on account of draft, to complete loading, from one point to another, the pilot on board such vessel shall be allowed seven dollars for the "drop," exclusive of the regular pilotage.

Rule 31.—Any vessel from sea brought to safe anchorage in the sound, by order of the master, owner, or consignee, and afterwards proceeds to loading ground, the pilot on board such vessel shall be allowed seven dollars for the "drop," exclusive of the regular pilotage.

Rule 33.—Any vessel arriving at this port, and coming in over the bar without being boarded by a pilot, it shall then be optional with the master whether he takes the pilot in or out: *Provided*, such vessel or vessels did not seek to elude or run away from any pilot boat or boats seeking to board said vessel or vessels beyond the bar.

Rule 34.—In case a vessel has complied with the rules requiring twenty-four hours' notice to pilots, and no pilot makes his appearance on board said vessel, any steamer or steam tug, duly licensed by United States authority, shall have full power to move said vessel without a pilot, upon being so required to do by the master at his risk.

Rule 37.—As there has been frequent disputes in deciding what constitutes a "drop," and is chargeable to the vessel, it is hereby defined, that any detention in moving a vessel, whereby a tide is lost, for the benefit of the vessel, shall be called a "drop," and paid for

† Established by the Board of Pilot Commissioners, October 30, 1885.

accordingly; but when a vessel is ready for sea, and is detained for want of water, or any other cause over which the master has no control, the same will *not* be called a "drop" or detention, but will be included in the regular pilotage.

RATES OF PILOTAGE.

From Doboy and Sapelo Bar, and Darien and Sapelo River.

Draft—Feet.	Bar Pilotage to Upper Buoy or Safe Anchorage.	River Pilotage from Upper Buoy or Safe Anchorage to Darien or any other Landing.	Total.
6	$11.00	$8.00	$19.00
7	12.00	9.00	21.00
8	13.00	10.00	23.00
9	16.00	12.00	28.00
10	18.00	13.00	31.00
11	21.00	14.00	35.00
12	23.00	19.00	42.00
12½	26.00	21.00	47.00
13	31.00	23.00	54.00
13½	34.00	25.00	59.00
14	35.00	26.00	61.00
14½	36.00	27.00	63.00
15	41.00	30.00	71.00
15½	43.00	31.00	74.00
16	46.00	33.00	79.00
16½	48.00	34.00	82.00
17	52.00	37.00	89.00
17½	54.00	39.00	93.00
18	58.00	41.00	99.00
18½	60.00	43.00	103.00
19	64.00	46.00	110.00
19½	67.00	48.00	115.00
20	70.00	49.00	119.00
20½	75.00	50.00	125.00
21	82.00	53.00	135.00
21½	90.00	55.00	145.00
22	105.00	57.00	162.00
22½	120.00	60.00	180.00
23	135.00	62.00	197.00

"Drop, $7.00; every day's detention, $3.00; foreign vessels, 50 per cent additional to the above rates."

Note.—There being no harbor master in 1900 for the port of Darien, pilots are required to perform the duties of harbor master for the vessel in their charge.

PORT OF BRUNSWICK.

Extracts from Rules and Regulations of the Commissioners of Pilotage for the bar of St. Simons and Turtle River, and the bar of St. Andrews and Satilla River.†

Rule 1.—The master, owner, or consignee of any ship or vessel requiring a pilot, shall give twenty-four hours' notice thereof in writing, in the book kept for that purpose, at the place designated by the Commissioners of Pilotage. It shall, however, be competent for any Commissioner of Pilotage to direct forthwith any pilot, not having any vessel in charge, to go on board of any ship or vessel that may arrive in the river without a pilot, or any ship or vessel which, by any accident or contingency, may be destitute of a pilot, to take her to sea.

Rule 2.—The office of the Commissioners of Pilotage is designated by this Board as the place where books shall hereafter be kept (as ordered by the first rule of the Board), wherein masters of vessels, owners or consignees of any ship or vessel requiring a pilot, shall give twenty-four hours' notice thereof in writing. * * *

Rule 3.—For every day's detention of a pilot in town or in the river, by the master of any ship or vessel, after the above twenty-four hours' notice has been given, the pilot shall be entitled to receive four dollars ($4.00) per day for such detention.

Rule 12.—* * *. All pilot boats must be able to go to sea at all reasonable times, and shall have conspicuous numbers placed on their sails, the said numbers to be designated by the Board.

Rule 13.—The pilot boats belonging to the bar of St. Simons shall keep alternate station, cruising within the limits embraced between the north end of Little St. Simons Island and the bar of St. Andrews, and the outer buoy, with the privilege of remaining near St. Simons

† Adopted October 1, 1889, and of full force and effect on and after that date.

Lighthouse in very rough weather, for one week each. * * * When on station, the boat shall keep a conspicuous signal at the masthead. * * *

Rule 20.—The pilot boats when in sight of a vessel wanting a pilot shall, if there is no pilot on board, signalize the fact by running their flags or signals up and down twice in the daytime, and by making at night a like signal with the masthead lights.

Rule 21.—It shall be the duty of each pilot, on boarding a vessel, to take charge of the same, furnish the master thereof with a copy of these rules and regulations, * * * and when he has brought the vessel to anchor, he shall moor the same, or give proper directions therefor, and for her safe riding at such mooring, and he shall dock such vessel if required by master on arrival, and said pilot shall not be entitled to compensation in addition to his pilotage fees for so doing; and he shall inform the master of the vessel of the laws requiring lights on board, and of his duty to report his arrival at the office of the harbor master within four hours thereafter. * * * When a vessel is loaded, or partly loaded, and ready to drop below Brandy Point, or to St. Simons Sound, it shall be the duty of the pilot to go on board and conduct her to an anchorage at the point desired.

Rule 26.—Any master, owner, or consignee of any vessel who shall employ any other pilot to carry such vessel down, or to sea, other than the pilot who brought the vessel in, without good and sufficient cause therefor, to be judged by the Board, shall forfeit and pay double the amount of such vessel's pilotage—* * *.

Rule 29.—The master of any vessel who shall follow a pilot boat in over the bar, or follow another vessel with a pilot on board, if spoken outside the bar, the said pilot shortening sail or in any manner conducting his vessel so as to be a guide to the one following, shall pay one-half pilotage to the pilot thus aiding his vessel: *Provided*, there shall be no other pilot boat in sight, which could render said assistance in bringing said vessel in over the bar.

Rule 45.—Any vessel applying for license shall exhibit her receipt for inward pilotage before license shall be granted, and said vessel shall pay for said license and seal of commissioners a fee of three dollars ($3.00), and no license will be valid without bearing seal of commissioners.

Rule 47.—All pilots performing their duty as such on board any vessel coming into the ports of Brunswick, or St. Andrews Sound, and Satilla River, shall be entitled to demand, claim, receive, and sue for, if necessary, before any court having jurisdiction, the amount claimed for his services, in proportion to the draft of water of said vessels, according to the following

RATES OF PILOTAGE

for the bar of St. Simons and Turtle River and the bar of St. Andrews and Great Satilla river.

Feet.	Pilotage.	Feet.	Pilotage.	Feet.	Pilotage.	Feet.	Pilotage.
6	$16.75	10½	$37.00	15	$71.00	19½	$111.00
6½	18.75	11	39.00	15½	74.00	20	117.00
7	20.25	11½	41.25	16	79.00	20½	123.00
7½	21.75	12	43.75	16½	82.25	21	129.00
8	23.00	12½	46.75	17	87.00	21½	135.00
8½	24.50	13	49.25	17½	89.50	22	142.00
9	26.00	13½	52.25	18	93.00	22½	165.00
9½	27.75	14	58.00	18½	99.00	23	195.00
10	31.75	14½	67.00	19	105.00		

Extract from Harbor Master's Rules of the Port of Brunswick. †

2. The master of any vessel lying at anchor in any part of the harbor or river, in the night time, shall cause a good and sufficient light to be shown in the fore rigging of such vessel, at least twenty feet above her deck, which light shall be kept burning during all hours of the night; and for every neglect such master or commander shall be fined in a sum not exceeding thirty dollars.

3. Every vessel shall always have on board a ship keeper or other person capable to take charge of her.

4. Every vessel hauling past or lying alongside and made fast to another vessel, shall put out, in a proper manner, good and sufficient fenders, and keep the same so placed as to prevent injury to the vessel she shall be alongside of, and shall likewise so place her moorings as to prevent injury to said vessel; and if discharging or taking in cargo athwart said vessel's deck, she must also keep her plank or staging so fixed as not to cause injury, under penalty of fifty dollars.

5. Masters of vessels shall not permit ballast, rubbish, or dirt of any kind to be thrown into the river or harbor. All ballast or coal shall be thrown not less than ten feet back, clear of the heads of the wharves. A heavy sail or tarpaulin must be securely placed

† Harbor regulations for the port of Darien are practically the same as the harbor master's rules for Brunswick, excepting the fees.

between the vessel and the wharf, extending under and five feet on each side of the stage, to prevent any from falling into the river, and the tarpaulin or sail shall be kept clear of ballast all the time. The sweepings of the deck, ashes from the caboose, and rubbish of all kinds must be put upon the wharf and carted away. Any master of a vessel failing to comply with any of these rules shall be fined in a sum not exceeding one hundred dollars, * * *.

6. No tar, pitch, or turpentine shall be boiled on any vessel's deck lying at any wharf or within fifty feet of any vessel or building, under a penalty not exceeding thirty dollars.

7. No ballast or rubbish of any description shall be landed without the permission of the harbor master or his assistant, under a penalty not exceeding thirty dollars.

8. Any master or other person having charge of any ship or vessel, who shall refuse or neglect to obey the directions of the harbor master or his assistant in any matter or matters within his or their authority, or shall molest, resist, or oppose the harbor master or his assistant in the execution of any of the duties of his or their office, such master, commander, or other person having charge of any vessel, or other person whatsoever, shall, for every such offense, forfeit and pay a sum not exceeding one hundred dollars.

10. All vessels arriving in the harbor seeking or waiting for cargo, shall moor alongside a dock or anchor in the river, according to the instructions of the harbor master.

11. The harbor master shall take charge of all foreign vessels, after being brought to anchor in the harbor, and dock the same at quarantine wharves, or wharves in this harbor, and also drop or dock the vessel to or at any point that may be desired.

12. No person shall fire a gun, pistol, or other firearm on any vessel lying at any wharf or at anchor in the river within the city limits, under the penalty of a fine not exceeding one hundred dollars.

13. No vessel shall anchor in the channel of the river known as The Shoal, from Crook's wharf to the lower end of the jetties, at any time, nor shall any vessel anchor in the channel in front of the city for more than twenty-four hours without permission of the harbor master, under a fine not exceeding fifty dollars.

14. The harbor master shall be entitled to receive and collect, in addition to the fees allowed by sections 196, 197, and 195 of the Code of Ordinances, the following fees:

Port fees	$1.00
Furnishing dock	3.00
Settlement of disputes among masters	3.00
Docking a vessel under 400 tons	2.50
Docking a vessel of 400 tons and upward	5.00
Dropping vessels above and below Brandy Point	6.00
Dropping vessels in front of city	3.00

15. The masters of vessels shall brace round the yards, cathead the anchors, and rig in the jibbooms, whenever required by the harbor master, under a penalty not exceeding $50.

FLORIDA.

PILOTS AND PILOTAGE.

Extracts from the Revised Statutes of Florida, 1892.

945. Penalty for acting as pilot without license.—Any person who shall act as pilot for any of the ports in this state without a license from said board of commissioners, shall be guilty of a misdemeanor, and shall be fined one hundred dollars for each offense.

946. Per diem to pilots in quarantine.—In all cases where a pilot shall be detained in quarantine by reason of having boarded any vessel in the discharge of his duty as such pilot, the said vessel or owners shall be required to pay to such pilot $4 per day during the time of his necessary detention in quarantine.

947. Pilot bringing vessel in entitled to take her out.—Any licensed pilot who shall take or bring a steamer or vessel into port shall be entitled to take her out, * * *.

948. Rates of pilotage.—The board of pilot commissioners of each port may fix the rates of pilotage which shall be paid by any vessel entering their port; but in no case shall they fix the rates greater than the rates now provided by law, as follows: All steamers or vessels entering any port or leaving the same shall be subject to pay to any licensed pilot performing duty on board, or to the pilot who shall first speak to such steamer or vessel, the following rates of pilotage: For steamers or vessels drawing 6 feet or less than the same, $2 per foot; for steamers or vessels drawing from 6 to 10 feet, $3 per foot; for steamers or vessels drawing from 10 to 14 feet, $4 per foot; for steamers or vessels drawing from 14 to 20 feet, $5 per foot; for steamers or vessels drawing over 20 feet, $6 per foot. These rates shall apply to all steamers or vessels, whether owned wholly by citizens of this state or not: *Provided*, That

all steamers or vessels carrying the regular United States mails shall pay half pilotage only: *Provided, further*, That all steamers or vessels drawing less than 6 feet of water, and having a coastwise license, shall be exempt from paying whole or half pilotage, unless they employ a pilot.

HARBOR CONTROL.

Sec. 937. *Deposit on wharf, etc., regulated.*—It shall not be lawful for any person to deposit or cause to be deposited on any wharf or quay, any ballast, stone, earth, or like material, except such wharf or quay be so secured as to prevent such ballast or other material from washing into the waters of the harbor.

Sec. 949. *Pilot commissioners may make regulations for port.*—Every steamer or vessel of any description, of the tonnage of twenty tons and upwards, while lying at anchor in any of the bays, ports, harbors or rivers of this state, where there is a board of pilot commissioners, shall during the night show such light as may required by the port regulations established for the port; * * * * * and any person violating any such rule or regulation shall be deemed guilty of a misdemeanor, and upon conviction thereof shall be punished by a fine not exceeding one hundred dollars or be imprisoned in the county jail not exceeding sixty days, one or both, at the discretion of the court.

HARBOR MASTERS IN GENERAL.

956. *Duties and fees.*—It shall be the duty of said harbor masters to board either in person or by deputy, every vessel coming into their respective ports, and to demand of the master of every vessel arriving from sea, the permit of the port physician,† and to deliver the same to the president of the board of health of said port; it shall be the duty of every master of any vessel arriving at the ports in this State to report to the harbor master for a station or for a berth at the wharves, and the harbor master shall regulate and station or assign berths at the wharves to said vessel; and it shall be their duty to remove or cause to be removed, from time to time, all vessels not employed in receiving and discharging their cargoes, to make room for such others as require to be more immediately accommodated, for the purpose of receiving or discharging their cargoes, and to facilitate their dispatch. It shall be the duty of said harbor masters to be present at all times either in person or by deputy, to facilitate by stationing or assigning berths at the wharves to vessels arriving at the ports, and to facilitate them in the discharging and receiving their cargoes and to prevent confusion and delay. And the said harbor masters shall have full and absolute power to determine how far and in what instance it is the duty of masters and others having charge of vessels to accommodate each other in their respective situations, and if any master or wharf owner or lessee of a wharf or wharves, or other person, shall oppose or resist the harbor master or his deputy or deputies in the execution of his or their duties, he shall be deemed guilty of a misdemeanor and shall be fined in a sum not exceeding fifty dollars for each offense, or imprisoned not exceeding thirty days, one or both, at the discretion of the court trying the same. Harbor masters, respectively, shall receive a compensation for the duties required of them by this article from the owners, masters or consignees, or either of them, of every vessel arriving at the port to receive or discharge cargoes, the following fees, viz: For any vessel drawing ten feet or less the sum of five dollars, and for any vessel drawing more than ten feet, the sum of one dollar for every additional foot of draft.

2746. *Obstructing harbor master in certain ports.*—If any person shall oppose or resist a harbor master * * * or his deputy, in the execution of his duties, or shall disobey any order given by either of them as to the manner of removing or adjusting the rigging of any vessel under the control of such person, he shall be punished by imprisonment not exceeding one year, or by fine not exceeding five hundred dollars.

QUARANTINE.

Extracts from the Maritime Regulations of the State Board of Health of Florida, 1897. In force, 1900.

Rule 2.—*Penalty for violating rules.*—Any person who violates, disobeys, omits, neglects, or refuses to comply with any quarantine regulations which may be established by the State health officer or any of the rules and regulations which may be adopted by the State Board of Health * * * * shall be guilty of a misdemeanor, and upon conviction thereof shall be fined in a sum not less than $100 nor more than $1,000, or be imprisoned in the county jail for not less than one nor more than six months. (*Rev. Stat. Sec. 779.*)

† See also National Quarantines, Appendix IV.

Rule 15.—*Control of quarantine and power to arrest.*—The State Health Officer, under the direction of the State Board of Health, shall have the general administrative and executive control of all the maritime and domestic quarantine systems of the State. * * *

Rule 20. *Tainted food.—Materials to be destroyed.*—No decayed or tainted meat, fish, fruit, or vegetables will be permitted to be brought into or landed, kept, sold, or offered for sale at any of the ports, harbors, cities, or towns in the State of Florida at any season of the year; and any attempt to do so will subject such meat, fish, fruit, or vegetables to destruction, and the master of any vessel, company, corporation, or individual violating this rule, to prosecution in the courts of the State.

Rule 21. *Offensive fertilizer materials and hides.*—No cargo consisting of green salted hides, bones, bone dust, or guano, or fertilizers of any kind that have become damaged by water so as to be offensive and detrimental to the public health, shall be permitted to be discharged or landed on any wharf or dock of any city or town in the State, or any settled port thereof.

Rule 65. *The quarantine season.*— * * * the active quarantine season is hereby declared to extend from the first day of April to the first day of November; except as may be otherwise ordered.

Rule 66. *Vessels not to enter except in accordance with Rules. Penalty for violation.*—No vessel shall be permitted to enter any of the ports, harbors, or inlets of the State of Florida, except under such restrictions and regulations as to medical and sanitary inspection as the State Board of Health may hereinafter and from time to time prescribe; and every master or person in charge of any such vessel violating the regulations of this Board shall be subject to the penalties of Rule 2.

INSPECTION.

Rule 69. *Vessels must lie-to for inspection.*—Vessels subject to inspection as prescribed in Rules 70 and 71 arriving at any of the ports of the State of Florida, must "lie-to" or anchor, at a point to be designated in each harbor as the inspecting point, and marked by a buoy or a yellow flag, and there remain until inspected by the Sanitary Inspector of the port, acting under authority of the State Board of Health.

Rule 70. *Vessels subject to inspection at all seasons of the year.*—Vessels which arrive and seek entrance at any of the ports of the State of Florida, of the following classes, are subject to inspection at all seasons of the year:

(*a*) All vessels with sickness on board at arrival or upon which sickness shall appear while in port;

(*b*) All vessels from foreign ports which have not been inspected and disinfected and which have not discharged passengers and crew at a domestic port, free from infection;

(*c*) All vessels from a domestic port suspected of infection with yellow fever, smallpox or cholera.

Rule 71. *Vessels subject to inspection during quarantine season.*—All vessels, whether from foreign or domestic ports, which arrive and seek entrance at any of the ports of the State of Florida, during the quarantine season as specified in Rule 65 are subject to inspection.

Rule 72. *Time of inspection.*—The inspection of vessels required by these regulations shall be made, as far as possible, between sunrise and sunset, except in cases of vessels in distress.

Rule 73. *No person to board vessel.*—No person except the State Health Officer, the port sanitary inspector and his employees, shall be permitted to board or leave any vessel subject to inspection until after the vessel has been inspected by the Port Sanitary Inspector (quarantine officer) and if vessel is ordered into quarantine for detention or disinfection, until after the period of detention or completion of disinfection, and the discharge of said vessel; * * * *

Rule 77. *Vessels calling but not entering.*—A vessel from a foreign port calling at any port in the State of Florida for orders, supplies, or coal, *only*, may be allowed to proceed, unless there is a quarantinable disease on board at the time, or such disease has been on board at ports *en route* or at ports of departure, or she is believed to be infected, in which case coal or supplies by barge can be towed to her, and she can take coal and supplies from barge with her own crew; but the Port Sanitary Inspector at the port shall allow no person or dunnage from such vessel to go ashore.

Rule 78. *Fruit vessels.*—Vessels engaged in the fruit trade, not carrying passengers nor having carried passengers from one infected port to another and having held no communication with any other vessel, carrying only fruit, unwrapped rubber, or specie from ports known to be healthy: *Provided*, They have complied in every respect with the rules and regulations made by the Secretary of the Treasury for such ports and with the regulations of this board.

Rule 79. *Quarantinable diseases defined.*—For the purpose of these regulations quarantinable diseases are cholera (cholerine), yellow fever, smallpox, typhus fever, leprosy; and "suspicious ports" or places suspected of being infected, are all ports in the West Indies on the east coast of America between 23° 30′ north and 32° south latitude, and on the west coast of Africa between 23° 30′ north and 10° south.

Rule 80. *Vessels subject to disinfection to be sent to station.*—After inspection the State Sanitary Inspectors will direct all vessels found subject to quarantine or disinfection to the nearest quarantine station, viz: Vessels destined to ports on the west coast of the State between Key West and Cedar Keys, including both of these ports, to report at the Tampa Bay Quarantine Station, Mullet Key, Tampa Bay, or the U. S. Quarantine Station, Mullet Key, Key West, Florida; for points beyond and west of Cedar Keys, to the Santa Rosa Island Quarantine Station, entrance to Pensacola Harbor, or the U. S. Quarantine Station on Ship Island; for ports on the east coast to the Cumberland Sound Quarantine Station, Fernandina Harbor or the U. S. Quarantine Station on Blackbeard Island, Sapelo Sound.

Rule 82. *Vessels subject to quarantine detention at all seasons of the year.*—The following classes of vessels are subject to quarantine and disinfection at all seasons of the year:

(a) All vessels in an unsanitary condition when inspected, or upon which there shall be sickness of an infectious or contagious nature;

(b) All vessels in port at any season of the year upon which yellow fever, cholera, smallpox, leprosy or other contagious or infectious disease develop after arrival;

(c) All vessels without the required bill of health; *Provided, however,* That permission may be given to enter harbor and proceed to an anchorage at the discretion of the State Sanitary Inspector, when in good sanitary condition and free from sickness, and having a certificate from the medical officer in charge of the nearest quarantine or refuge station that said vessel and cargo and effects of passengers and crew have been thoroughly cleansed and disinfected according to the rules and regulations of this board; that said vessel has been detained at said quarantine or refuge station for a term of not less than five days after such disinfection that no case of yellow fever, cholera, smallpox, leprosy or other contagious or infectious disease has within that time developed among any of the crew or passengers; that the ballast of said vessel was discharged at said quarantine or refuge station before disinfection, and clean ballast, if necessary, taken at said station in lieu of the ballast discharged, which certifiate shall be of a date subsequent to the leaving of said vessel from any foreign or domestic port infected with any contagious or infectious disease.

(d) All vessels from a port where infectious or epidemic disease prevails to such an extent that, in the opinion of the State Health Officer, communication with such port without disinfection or detention will endanger the health of the State.

Rule 83. *Vessels subject to quarantine detention during active quarantine season.*—In addition to the provisions of Rule 82, all vessels directly or indirectly from foreign or domestic ports where yellow fever, cholera, smallpox, leprosy or other contagious or infectious disease may prevail, shall be subject to quarantine and disinfection during the quarantine season, as specified in Rule 65.

Rule 84. *Crews must be acclimated in all seasons.*—All vessels plying between foreign ports and the ports, harbors or inlets of the State of Florida must be provided with crews acclimated to yellow fever at all seasons of the year.

Rule 85. *Vessels in foreign trade must be clean in all seasons.*—Steamships or other vessels plying between the ports of the State of Florida and any West Indian, South American or other foreign port, must be kept in a cleanly and sanitary state at all times, and be subject to inspection by this Board of Health, * * * *

Rule 86. *Household effects not admitted.*—No bedding or household effects shall be brought from any port of the West Indies, South America or other foreign port that may be infected with an epidemic contagious or infectious disease, or from any infected port or place in the United States, to any port or place in the State of Florida, at any season of the year; and the master of any steamship or other vessel, or any transportation company who disobeys this regulation shall be deemed guilty of violating this rule, and shall be dealt with as contemplated by Rule 2.

Rule 88. *Passengers on foreign vessels during quarantine season.*—Steamships or other vessels plying between any West Indian, South American, or other foreign port and any ports in the State of Florida, during the quarantine season as specified in Rule 65 shall not bring as passengers from any such ports where endemic or epidemic contagious or infectious diseases exist, to any port of the State of Florida, any person who is not acclimated to yellow fever by having had an attack of the disease, or by continuous residence in cities and towns where such disease is endemic for a period of ten years or over, and has not had smallpox or been successfully vaccinated; and masters of steamships or vessels shall not receive for transportation any passenger without a certificate from an agent of this board or an accredited medical officer of the United States in said port, stating the exemption of said passenger from contracting or developing yellow fever, cholera or smallpox, which certificate, together with another setting forth the freedom of baggage from infection, must be produced to the Port Sanitary Inspector at the port of arrival in this State before *pratique* can be given to said vessel or passenger. And the master of any steamship or vessel who shall attempt to transport passengers in defiance of this rule will subject himself, ship or vessel, crew or passengers, to quarantine and to such requirements of detention and disinfection as this State Board may direct and to prosecution in the courts of the State, as specified in Rule 2.

Rule 90. *Vessels from infected ports must carry water or clean stone ballast.*—All vessels in regular trade between foreign ports and any of the ports, harbors or inlets of the State

of Florida, must carry as ballast either water, clean rock or stone. If water ballast is used it must not be changed either in any foreign port or any port in the State of Florida, but in the open sea. If rock or stone ballast is used it must be procured from some noninfected port or place.

Rule 91. *Discharge of Ballast.*—The State Health Officer shall have the right and it shall be his duty to require the ballast of any vessel to be discharged at the place indicated by him or at the nearest quarantine station, whenever the public health of the State shall, in the opinion of such officer require such action. The charge for the disinfection and discharge of ballast shall be at the actual cost of the service performed and at no cost to the vessel if done by her own employees.

Rule 105. *Classification of inspection and disinfection fees to be charged at all ports in the State of Florida.*

1. INSPECTION:

Steamships and ships	$10.00
Tugs, brigs, barks, barkentines, and three and four masted schooners	7.50
Two-masted schooners and other vessels, except sloops	5.00
All vessels making regular trips from noninfected domestic ports, except sloops	5.00
Sloops	3.00

2. DISINFECTION:

(By steam sterilization, sulphur fumigation and mercuric washing):

Steamships and ships	$60.00
Barks and four-masted schooners	50.00
Tugs, brigs and two and three-masted schooners	40.00
Smacks and all other vessels	25.00

3. DISINFECTION:

(By pot sulphur fumigation and mercuric washing, for vessels from "suspicious" ports only, and at ports at which no steam disinfecting plant is located):

Steamships and ships	$45.00
Barks and four-masted schooners	35.00
Brigs and two and three-masted schooners	25.00
Smacks and all other vessels	20.00
Tug boats	20.00

Discharge of ballast at actual cost and at no cost if performed by crew. (See Rule 91.)

4. EXCEPTIONS:

(*a*) All vessels, in regular trade with foreign ports making at least one regular trip per week, shall pay twelve hundred dollars ($1,200) per annum in lieu of all other charges for inspection and disinfection.

(*b*) No fees shall be charged at any port in this State for inspection of vessels from any ports of the State of Florida, unless such port or ports shall have been first declared infected by this State Board of Health.

PORT OF KEY WEST.

Rules and Regulations for the Government of Pilots of Key West, Florida.

Adopted August 17, 1893.

(*Extracts.*)

Sec. 1. The master of any vessel entering the port of Key West, who does not accept the services of a pilot shall be compelled to pay the full legal rates of pilotage, provided the vessel be spoken outside the following limits:

If she be entering by the Main Ship Channel she must be spoken outside the Western Head Buoy, or No. 1. If by Hawk Channel, she must be spoken east of Mid-channel buoy, intersecting Southeast Channel and Hawk Channel, Key West Light bearing NW. ¼ N.

If entering by Southwest Channel or Sand Key, she shall be spoken SW. of a line of No. 7 black buoy, and No. 8 red buoy in Southwest Channel. If entering Northwest Channel she must be spoken outside of No. 1 or Bar buoy.

If entering by Southeast Channel, must be spoken outside of No. 4 red buoy, Sand Key bearing SW. by W. ¾ W.

Should a vessel entering the port of Key West without being spoken by a licensed pilot outside the foregoing limits, the first pilot speaking her thereafter shall be entitled to full outward pilotage.

Sec. 7. Any pilot who shall bring a vessel into this port shall be entitled to carry her out, unless the master of said vessel can show good and sufficient reason to the contrary.

Sec. 8. Any pilot detained on board of any vessel by the master or quarantine officer, shall receive for each and every day's service the sum of five dollars per day over and above his pilotage.

Sec. 13. The rates of pilotage as now established by law are as follows:†

And all vessels drawing 14 feet or less shall pay the sum of five dollars for dropping from one anchorage to another and those drawing over 14 feet shall pay the sum of ten dollars.

Extract from a Resolution adopted by the Board of Pilot Commissioners, March 10, 1897.

* * * all vessels owned or appointed by regularly established lines calling at Port of Key West, Fla., or who have their orders delivered to them by any of the Pilots off the Port of Key West, Fla., outside the bar shall be charged only one full pilotage fee.

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†See the rates of pilotage in section 948, on page 155.

APPENDIX II.

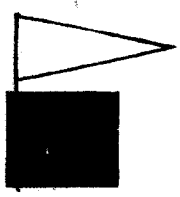
STORM-WARNING DISPLAYS OF THE U. S. WEATHER BUREAU.

STORM DISPLAYS ALONG THE SEACOAST.

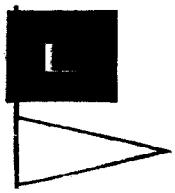
A red flag with a black center indicates that the storm is expected to be of marked violence.

The pennants displayed with the flags indicate the direction of the wind; red, easterly (from north through east to south); white, westerly (from south through west to north). The pennant above the flag indicates that the wind is expected to blow from the northerly quadrant; below, from the southerly quadrant.

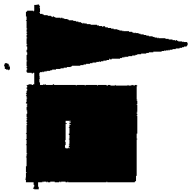
STORM-WARNING FLAGS.



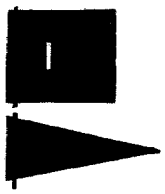
Northwesterly winds.



Southwesterly winds.



Northeasterly winds.



Southeasterly winds.

By night a red light will indicate easterly winds and a white light above a red light will indicate westerly winds.

Hurricane.

The "**Hurricane Display**" denotes the expected approach of a hurricane or of one of the severe and dangerous storms that occasionally moves across the Gulf of Mexico and along the Atlantic Coast.

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APPENDIX III.

WEST INDIA HURRICANES.*

These are cyclonic storms with a center of lowest barometer around which the wind blows in a more or less circular course (spirally) in a direction contrary to the hands of a watch; at the same time the storm field advances on a straight or curved track, sometimes with great velocity, and sometimes not more than a few miles in an hour, occasionally, in appearance, coming to a pause in its onward movement; the estimated velocity on the Atlantic Coast between Hatteras and the island of Cuba is 5 to 15 miles per hour. Hurricanes form eastward of the Windward Islands and take a northwesterly course; some curve gradually northward passing north of the island of Cuba and along the Atlantic Coast of the United States; others pass over or southward of Cuba and enter the Gulf of Mexico, and while in the Gulf curve northward or northeastward so as to strike the coast somewhere between Tampa, Fla., and the Rio Grande. The months during which hurricanes are encountered are June, July, August, September, October, and November. During these months mariners should be on the watch for indications of a hurricane, and should frequently and carefully observe and record the barometer.

Indications of the approach of a hurricane.—The best and surest warning is given by the barometer; during the hurricane season a decided fall and also sharp and irregular oscillations of the mercury are indications of an approaching storm. As the storm center approaches, unless the vessel is on the line of its advance, the force of the wind increases and the changes in its direction become more rapid; and when in or near the center the wind flies round at once to opposite points of the compass, the sea breaking in confused, mountainous heaps. A vessel on the line of the storm's advance will experience the above indications, except that, as the storm center approaches, the wind will remain steady, or nearly so, from one direction until the vessel is close-to, or in, the center.

The distance from the center of a hurricane can only be guessed at by watching the increase in the violence of the wind, the rapidity of its changes, and the falling of the barometer. If the barometer falls slowly, and the wind increases gradually, it may reasonably be supposed that the center is distant; with a rapidly falling barometer and increasing bad weather the center may be supposed to be approaching dangerously near. The following table, from Piddington's Sailor's Horn-book, may be of some use to the mariner at the approach of a hurricane to estimate his distance (approximately) from the center:

Average fall of the barometer per hour.	Distance from the center, in miles.
From 0.02 to 0.06	250 to 150
From 0.06 to 0.08	150 to 100
From 0.08 to 0.12	100 to 80
From 0.12 to 0.15	80 to 50

Few vessels have passed through the center of a hurricane without the loss of masts or rudder, or meeting with some worse disaster, and, at whatever cost, the center of the storm field should be avoided.

Bearing of center and rules for avoiding it.—When the weather and the barometer indicate the approach of a hurricane, face the wind; the center will then bear 8 points to the right from the direction of the wind (at a considerable distance from the center, and before the barometer has fallen much below the normal, the center may bear 10 or 12 points to the right of the wind direction). Having the bearing of the center, shorten sail, or heave-to, and closely watch the barometer and the direction in which the wind shifts. In speaking of the shift of wind, such a shift is meant as would be observed on a vessel hove-to; for, if the vessel be moving faster than the storm (which is easily possible), and in the same direction, the observed shift may be contrary to what it would be if the vessel were hove-to.

If the wind shifts with the hands of a watch, the vessel is in the right semicircle of the hurricane. The vessel should then be hauled by the wind on the starboard tack and sail carried as long as possible; if obliged to heave-to, do so on the starboard tack.

*Compiled from Piddington's Sailor's Horn-book; American Practical Navigator; Barometer Manual for the use of Seamen; Publications of the United States Hydrographic Office, Navy Department.

If the wind shifts against the hands of a watch, the vessel is in the left semicircle of the hurricane; the wind should be brought on the starboard quarter, the direction of the vessel's head noted, and that course steered. If obliged to heave-to, do so on the port tack.

If there is no perceptible change in the direction of the wind but it increases in violence, with a falling barometer, the vessel is directly in front, and on the track, of the storm. The vessel should be put before the wind, the direction of her head noted, and that course steered, trimming sail as the wind shifts to the starboard quarter. If obliged to heave-to, do so on the port tack.

If there is no perceptible change in the direction of the wind and it is moderating, with a rising barometer, the vessel is on the storm track but in rear of the center. In this case the safest rule is to run out with the wind on the starboard quarter, or heave-to on starboard tack. Advantage can be taken of favorable wind, but the greatest care must be exercised to avoid running into the storm. (See also remarks following.)

Remarks.—When looking in the direction in which the storm is traveling, the dangerous semicircle is on the right hand side of the storm track; in other words, the semicircle in which the wind shifts with the hands of a watch is the more dangerous part of the storm, and for the following reasons: Because the progressive movement of the storm increases the velocity of the wind in the right semicircle (the velocity of the wind in the left semicircle being correspondingly decreased); because both wind and current tend to carry the vessel in front of the storm, and if obliged to scud she will drive into greater danger; and because the right side is the one toward which the storm track is liable to recurve at any time.

In some cases vessels may, if the storm be traveling slowly, sail from the dangerous semicircle across the front of the storm and out of its influence. But, as the rate at which the storm travels along its track is uncertain, this is an extremely hazardous undertaking; the mariner should carefully consider all the circumstances, particularly the rate at which the barometer is falling, before he attempts to cross.

Vessels at anchor in any of the harbors, at the approach of a hurricane, should send down their spars and take every precaution, watching the wind as it shifts, and, if possible, lay their anchors so as to lie with an open hawse.

APPENDIX IV.

REGULATIONS U. S. MARINE-HOSPITAL SERVICE.

APPROVED NOVEMBER 27, 1897.

(*Extracts.*)

GENERAL DUTIES OF COMMISSIONED OFFICERS.

PROFESSIONAL DUTIES.

111. The professional duties of commissioned officers are to examine all applicants for relief, to prescribe for and furnish out-patient or hospital treatment as may be required, and to make physical examinations of the seamen of the several Government services and the merchant marine, under such regulations as shall hereinafter appear.

Professional duties defined.

112. Commissioned officers will, upon the application of the United States shipping commissioner, or of the master or owner of any United States vessel engaged in the foreign coastwise, or inland navigation trade, examine as to his physical condition any seaman brought to them for that purpose, and will give a certificate (Form 1928) as to his fitness or unfitness for service. They will physically examine, in acordance with existing regulations governing physical examinations, any foreign seamen sent them for that purpose by the duly authorized agent of a foreign line, or by the consul representing the nation to which the vessel belongs. A fee of $1 will be charged for each examination of a foreign seaman, and fees so received will be deposited with the collector of customs in the same manner as donations to the marine-hospital fund. Officers will also, upon the application of the proper authority, examine cadets, enlisted men, and persons desiring to enlist in the Revenue-Cutter, Life-Saving, Coast-Survey, and Light-House services, or to instruct them in the mode of resuscitating persons apparently drowned. No fee will be charged for this service. They will also examine alien immigrants when detailed for that purpose.

To examine seamen, cadets, enlisted men, etc., as to their physical condition.

113. Whenever officially requested by the local inspectors of steam vessels or other proper officers, commissioned officers will examine applicants for pilot's license as to sense of hearing, color perception, and general visual capacity, and will give a certificate accordingly.

To examine applicants for pilot's license.

114. No fee will be charged by any officer of the Marine-Hospital Service for the medical examination of seamen of the United States merchant marine or for making a certificate as to their physical condition.

No fee to be charged.

SANITARY DUTIES.

117. It shall be the duty of commissioned officers to enforce the national quarantine rules and regulations; but no additional compensation shall be allowed said officers by reason of such service as they may be required to perform except actual and necessary traveling expenses.

To enforce national quarantine rules and regulations. Apr. 29, 1878, s. 3; Feb. 15, 1893.

121. Upon the outbreak of smallpox at or near a relief station, commissioned officers will vaccinate such seamen as may come to the marine-hospital officer for the purpose; and officers are authorized, at all times, to visit vessels to examine and vaccinate crews.

To vaccinate seamen.

RELIEF STATIONS.

353. A relief station of the Marine-Hospital Service is a port situated on any navigable water of the United States where an officer of the Marine-Hospital Service is on duty to extend relief to seamen or where an officer of the customs service is specifically authorized to extend said relief.

Definition.

Classes.

354. Relief stations shall be divided into the following classes:

Class I. United States marine hospitals.

Class II. All other stations under command of a commissioned officer.

Class III. All stations under charge of an acting assistant surgeon where there is a contract for the care of sick and disabled seamen.

Class IV. All other relief stations not included in the above classes.

Provisions for relief.

355. At all relief stations where the number of patients warrants, an officer of the Marine-Hospital Service will be assigned to the command of the station, and, whenever practicable, the patients of the Service will be treated in hospitals maintained exclusively for their benefit. At places where Congress has made no provision for the erection of a marine hospital, buildings or rooms suitable for hospital purposes, or separate wards in State, municipal, or private hospitals, may be leased or rented, for the exclusive benefit of the patients of the service, or contracts may be made for the care and treatment of patients with local hospitals, subject to the approval of the Secretary of the Treasury.

Supervision of relief.

356. The medical and surgical treatment of the patients of the Marine-Hospital Service will be under the supervision of the commissioned and non-commissioned officers of the Service, at all relief stations where such officers are on duty, and they will be required to take direct professional charge of the patients.

Provision for marine-hospital dispensaries.

357. At each relief station of the first and second class, and whenever practicable at each relief station of the third class where an acting assistant surgeon of the Marine-Hospital Service is on duty, there shall be a marine-hospital office, where applicants for relief shall be received and examined, and the necessary action taken according to the regulations.

Location of offices and dispensaries.

358. The marine-hospital office shall be located at the custom-house whenever practicable, and suitable office room for that purpose shall be set apart by the custodian of the custom-house building, subject to the approval of the Secretary of the Treasury.

Districts.

359. The relief stations of the Marine-Hospital Service are grouped into eight districts, as follows:

The district of the North Atlantic; the district of the Middle Atlantic; the district of the South Atlantic; the district of the Gulf; the district of the Ohio; the district of the Mississippi; the district of the Great Lakes, and the district of the Pacific.

South Atlantic.

362. The district of the South Atlantic embraces the following-named relief stations: Beaufort, N. C.; Beaufort, S. C.; Brunswick, Ga.; Charleston, S. C.; Darien, Ga.; Edenton, N. C.; Elizabeth City, N. C.; Fernandina, Fla.; Georgetown, S. C.; Jacksonville, Fla.; Key West, Fla.; Newbern, N. C.; Savannah, Ga., and Wilmington, N. C.

BENEFICIARIES.

Persons entitled to relief.

368. The persons entitled to the benefits of the Marine-Hospital Service are those employed on board in the care, preservation, or navigation of any registered, enrolled, or licensed vessel of the United States, or in the service on board of those engaged in such care, preservation, or navigation. Officers and crews of the Lighthouse Establishment, officers and crews of the Revenue-Cutter Service, seamen employed on the vessels of the Mississippi River Commission, seamen employed on vessels of the Engineer Corps of the Army, and keepers and crews of the United States Life-Saving Service are entitled to the facilities of the hospitals and relief stations under special rules hereinafter prescribed. Officers and seamen employed on vessels of the Coast and Geodetic Survey who are not enlisted men from the Navy, are entitled to the benefits of the Marine-Hospital Service.

Yachtsmen entitled.

369. Seamen employed on yachts are entitled to treatment, provided the said yachts are enrolled, licensed, or registered as vessels of the United States.

Exceptions, R. S., s. 4804.

370. No person employed in or connected with the navigation, management, or use of canal boats engaged in the coasting trade shall, by reason thereof, be entitled to any benefit or relief from the marine-hospital fund.

Wrecked seamen entitled.

372. Seamen taken from wrecked vessels of the United States are entitled to the benefits of the Marine-Hospital Service if sick or disabled, and will be furnished care and treatment without reference to the length of time they have been employed.

Seamen sent by consular officers entitled. U. S. Rev. Stat., s. 4577.

373. Seamen employed on merchant vessels of the United States returned to the United States from foreign ports by United States consular officers, if sick or disabled at the time of their arrival in a port of the United States, shall be entitled to the benefits of the Marine-Hospital Service without reference to length of service.

374. A sick or disabled seaman, in order to obtain the benefits of the Marine-Hospital Service, must apply in person, or by proxy if too sick or disabled so to do, at the office of the Marine-Hospital Service, to an officer of that Service, or to the proper customs officer acting as the agent of the Marine-Hospital Service at stations where no Marine-Hospital officer is on duty, and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Seamen must make application for relief.

375. Master's certificates and discharges from United States shipping commissioners, made out and signed in proper form, showing that the applicant for relief has been employed for sixty days of continuous service "in a registered, enrolled, or licensed vessel of the United States," a part of which must have been during the sixty days immediately preceding his application for relief, shall entitle him to treatment. The phrase "sixty days continuous service" shall not be held to exclude seamen whose papers show brief intermission between short services that aggregate the required sixty days.

Evidence to be presented by applicant.

U. S. Rev. Stat., 4803.

376. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seamen on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

Certificates from owners or agents as evidence.

377. Masters of documented vessels of the United States shall, on demand, furnish any seaman who has been employed on such vessel a certificate (Form 1914) of the length of time said seaman has been so employed, giving the dates of such employment. This certificate will be filed in the marine-hospital office or office of the customs officer, when application is made for relief, whether the relief is furnished or the claim rejected.

Masters must furnish certificate of service.

378. In case the master of any vessel shall fail or refuse to furnish a master's certificate to any seaman who may have been employed on board said vessel within sixty days, the collector of customs shall cause said master, if he be in port, to appear at the marine-hospital office and produce the ship's books.

Masters refusing to give certificate. Secs. 5438 and 5440, R. S.

379. Any master of a vessel or other person who shall furnish a false certificate of service, with intent to procure the admission of a seaman into any marine hospital, shall be immediately reported to the nearest United States attorney for prosecution.

False certificates.

380. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation on account of ice or low water, such interval shall not be considered as excluding him from relief unless the sickness or injury for which he applies for relief be the direct result of employment on shore.

Exceptions.

381. During the season when navigation is closed at any port by reason of ice or low water, seamen applying for relief at such ports shall be entitled to same, provided they present the documentary evidence required in paragraph 375, which must show that the applicants were employed within sixty days immediately preceding the said closure of navigation, and it must be satisfactorily shown that the disease or injury was also acquired during the time of their service.

Closure of navigation.

382. The time during which a seaman has been under treatment in hospital as a patient of the Marine-Hospital Service shall not be reckoned as absence from vessel in respect to debarring him from further relief.

Period of treatment not to be reckoned as absence from vessel.

383. Whenever an applicant for relief presents himself at the marine-hospital office or the custom-house without a master's certificate or shipping commissioner's discharge and it is impracticable to obtain such certificate on account of the absence of the vessel or its master from the port, the affidavit of the applicant as to the facts of his last employment, stating names of vessels and dates of service, may be accepted as evidence in support of his claim for the benefits of the Marine-Hospital Service.

Affidavits may be accepted as evidence.

384. When the period of the seaman's service as shown by his certificate on last vessel is less than sixty days, his affidavit as to previous service may be accepted if supported by satisfactory evidence.

Brief service on last vessel not a bar to relief.

387. When a seaman applies for relief after an absence of sixty days or more from his last vessel, and it satisfactorily appears that such absence was due to sickness or injury acquired in the line of duty, and that it was impracticable for him to apply to the proper officer for treatment, a statement of the facts, together with a copy of the application and other papers in support of same, shall be forwarded to the Supervising Surgeon-General for decision.

Applications for relief after sixty days' absence from vessel.

388. Any seaman who is able to write will be expected to sign his name upon the face of the master's certificate issued to him before said certificate is signed by the master of the vessel. * * *

Seamen to sign certificates.

Out-patients to furnish new service certificates.

390. When a seaman who has received continuous treatment at the out-patient office for a period of two months applies for further treatment, he must, to entitle him to treatment, furnish a new certificate of service showing that he is still following his vocation as seaman.

Expenses for sickness during voyage.

391. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid by the Marine-Hospital Service.

Seamen admitted to local quarantine hospitals.

392. The expenses for the care and treatment of seamen suffering from contagious diseases entitled to the benefits of the Marine-Hospital Service, who, in accordance with the State or municipal health laws and regulations, are taken to quarantine or other hospitals under charge of the local health authorities, will not be paid from the Marine-Hospital fund unless such seamen were admitted at the time by the request of an officer of the Service.

Money not to be paid to seamen for expenses of sickness.

393. In no case shall money be paid to a seaman or to his family or friends by the Marine-Hospital Service as reimbursement for expenses incurred during sickness or disability.

Seamen injured in brawls not to receive treatment.

395. Seamen who may be injured during street brawls or while committing a breach of the peace, and are therefore confined in jail or taken to civil hospitals by the local authorities for such acts, shall not receive treatment at the expense of the Marine-Hospital fund.

Seamen taken ill on vessel entitled.

396. Seamen taken seriously sick or injured while actually employed on a documented vessels shall be entitled to treatment at relief stations without reference to the length of tneir service.

Certificates of discharge.

397. A certificate of discharge may, at the discretion of the officer in charge of the case, be given to a hospital patient, but such certificate when presented at another relief station shall not be taken as sufficient evidence of the applicant's title to marine-hospital relief, but may be considered as collateral to other satisfactory data submitted by the seaman.

Only temporary relief contemplated.

398. Temporary relief only is contemplated and admission to hospital is not intended to permit an indefinite residence therein for cause other than actual disease or injury.

RELIEF.

OUT-PATIENT RELIEF.

Cases to be treated as out-patients.

399. Sick and disabled seamen entitled under these regulations to the benefits of the Marine-Hospital Service whose diseases or injuries are of such a nature that they can properly be relieved by medicines, dressings, or advice, without admission to hospital, shall be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require.

No relief furnished at homes of patients.

400. Seamen will not be furnished relief at their own homes, except by special authority from the Supervising Surgeon-General, and then only an allowance for medical attendance and medicines will be made at the rates fixed by the Treasury Department.

HOSPITAL RELIEF.

Cases for hospital treatment.

413. A sick or disabled seaman entitled to the benefits of the Marine-Hospital Service shall be admitted to hospital only in cases where the gravity of the disease or injury from which he suffers is such as to require hospital treatment in the opinion of an officer of the Service, or of a reputable physician designated by the Department to act at a place where no officer is stationed.

STATIONS OF THE FIRST CLASS.

To be valid only for day of issue.

416. A bed ticket (Form 1917) shall be prepared and delivered to the applicant for relief in a sealed envelope, addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that, unless presented on the day it is issued, the ticket will be invalid.

STATIONS OF THE SECOND CLASS.

To be valid only for day of issue.

424. A bed ticket (Form 1917) shall be prepared and delivered to the applicant for relief in a sealed envelope, addressed to the officer or other person authorized to receive the patient. The seaman should at the same time be informed that, unless presented on the day it is issued, the ticket will be invalid.

STATIONS OF THE THIRD CLASS.

432. Customs officers, or acting assistant surgeons when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit should be based upon the certificate of the acting assistant surgeon or attending physician, as given in the relief certificates, but should in no case exceed twenty days.

Permits for hospital relief. Form 1916.

STATIONS OF THE FOURTH CLASS.

445. Customs officers, or acting assistant surgeons when in charge of the station by special authority of the Bureau, shall issue hospital permits for the care and treatment of such applicants as may be found to be entitled to the benefits of the Service and require hospital treatment. The period for which treatment is authorized by the permit should be based upon the certificate of the acting assistant surgeon or attending physician, as given in the relief certificates, but should in no case exceed twenty days.

Permits for hospital relief. Form 1916.

448. The hospital permit, before being delivered to the applicant for relief, must be inclosed in an envelope, sealed, and addressed to the person authorized to receive the patient. The seaman should at the same time be informed that unless presented on the day it is issued the permit will be invalid.

Permits valid only on day of issue.

410. Out-patient relief will not be furnished except in cases of emergency, such as acute illness or injury, requiring not more than one or two visits.

Not more than two visits allowed.

412. Foreign seamen or employees of the various Government services, not beneficiaries, shall not be treated.

Foreign seamen et al. not treated.

INSANE SEAMEN.

462. Insane seamen entitled to the benefits of the Marine-Hospital Service may be admitted to the Government Hospital for the Insane, Washington, D. C., upon the order of the Secretary of the Treasury.

Relief for insane seamen. Mar. 3, 1875.

DECEASED SEAMEN.

468. On the death of a patient while under the charge of the Marine-Hospital Service, notice to receive his effects shall be given by letter, or otherwise, to his nearest known relative. * * *

Relatives to be notified.

469. The necessary expenses of a plain burial for deceased patients of the Service will be paid; but no part of the expenses of the burial of any deceased seaman will be paid for at the expense of the Marine-Hospital Service, unless said seaman was at the time of his death a patient of the Service. When friends or relatives of a deceased seaman claim the body and assume charge of the funeral arrangements, no part of the expenses of the same will be paid by the Marine-Hospital Service.

Burial expenses.

SEAMEN OF THE GOVERNMENT SERVICES AND FOREIGN SEAMEN.

UNITED STATES NAVY AND COAST SURVEY.

470. Officers and seamen employed on vessels of the United States Navy and the Coast Survey may be admitted for care and treatment as patients of the Marine-Hospital Service only upon the written request of their respective commanding officers. Every such admission shall be immediately reported to the Supervising Surgeon-General by the officer in charge of the station, on a daily report (Form 1942) or relief certificate (Form 1915), accompanied by a copy of the request upon which such officer or seaman was admitted. They shall be furnished treatment at stations of the first, second, and third class only. The rate of charge to be made for the care and treatment of the said officers and seamen will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." The above class of patients are not subject to the provisions requiring transportation to marine hospitals.

Officers and seamen of various Government services may be admitted.

FOREIGN SEAMEN.

471. The accommodations provided for the care and treatment of the patients of the Marine-Hospital Service are also available to foreign seamen at relief stations of the first, second, and third class upon the application of

Foreign seamen may be treated. Sec. 6, act Mar. 3, 1875; 18 Stat. L., 485.

the consular officer of the nation under whose flag they are sailing; or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory written security is given for the payment of the expenses of such care and treatment, at rates fixed annually by the Secretary of the Treasury. When treatment is furnished a foreign seaman, the fact will be immediately reported to the Supervising Surgeon-General, on a daily report (Form 1942) or relief certificate (Form 1915), accompanied by a copy of the application upon which he was admitted.

Bills for care and treatment, Form 1926.

472. A bill (Form 1926) in duplicate must be rendered by the officer of the Marine-Hospital Service in command for the care of each foreign seaman or other seaman admitted (not entitled to treatment free), said bill to be rendered upon the termination of treatment in each case One copy of this bill shall be delivered to the collector of customs, who shall at once collect the amount; the other copy shall be forwarded by the officer rendering the bill to the Supervising Surgeon-General.

Monthly accounts to be rendered.

473. Customs officers acting as agents of the Marine-Hospital Service shall collect all bills for the care and treatment of seamen of the classes enumerated in paragraphs 470 and 471 when rendered by the proper Marine-Hospital officer, and will render monthly accounts for all moneys collected on account of the care and treatment of such seamen; said accounts to be accompanied by abstracts giving the name and nationality of the patient, date of admission and date of discharge, period of treatment, and amount collected in each case.

Notification of amount of bill.

474. Collectors of customs will notify the commanding officer of the vessel of the class enumerated in paragraphs 470 and 471, upon whose request the seaman was admitted, of the amount of the bill, and when paid will give a receipt therefor. The money will be deposited as a repayment to the Marine-Hospital fund in the manner provided for moneys received for the care of foreign seamen.

Charges for care and treatment.

475. The rate of charge to be made for the care and treatment of foreign seamen will be fixed by the Department at the beginning of each fiscal year, and will be announced to officers and others in the annual circular entitled "Contracts for care of seamen." Foreign seamen are not subject to the provision of paragraphs 426 and 434 requiring transportation to marine hospitals.

THE REVENUE-CUTTER SERVICE.

Admitted without regard to length of service.

476. The officers and crews of the Revenue-Cutter Service will receive hospital or out-patient treatment, as hereinafter provided, on certificate signed by the commanding officer or executive officer of a revenue cutter, without regard to length of service. The certificate shall contain a description of the applicant for relief. Officers on leave or waiting orders may sign their own certificate.

Admitted to stations of class 1 and to contract hospitals.

477. Any such officer or seaman whose condition absolutely requires treatment in hospital will be admitted to hospitals at stations of the first class and to all contract hospitals enumerated in the annual circular entitled "Contracts for care of seamen," subject to the provisions of the said circular with regard to the transfer of patients from a contract to the nearest marine hospital. No admission to hospital will be granted at any port not mentioned in said circular. At all ports mentioned in the circular, where no specific arrangements for treatment in hospital are made, the regulations governing admission at fourth-class (emergency) stations will be enforced.

Out-patient treatment—where and how furnished.

478. Out-patient treatment will be furnished at all stations where an officer of the Marine-Hospital Service is on duty. At all other stations out-patient relief will be granted only in case of emergency and under the provisions of the regulations relative to fourth-class (emergency) stations. No out-patient relief will be granted at any station not mentioned in the annual circular entitled "Contracts for care of seamen," and in all other respects the regulations of the Marine-Hospital Service must be complied with.

THE LIGHTHOUSE SERVICE.

Officers and crews of the Lighthouse Establishment entitled.

487. Officers and crews of the several vessels belonging to the Lighthouse Establishment may be admitted to the benefits of the Marine-Hospital Service upon the application of their respective commanding officers. No charge will be made for care and treatment.

THE ENGINEER CORPS, UNITED STATES ARMY.

480. Seamen employed on vessels under the charge of the Engineer Corps of the United States Army shall be admitted to the benefits of the Marine-Hospital Service without charge at stations of the first, second, and third class upon the written request of the commanding officers of said vessels.

Seamen employed on vessels of the Engineer Corps, U. S. A., entitled.

NATIONAL QUARANTINES.

AN ACT granting additional quarantine powers and imposing additional duties upon the Marine Hospital Service.

(*Extracts.*)

[Approved February 15, 1893.]

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That it shall be unlawful for any merchant ship or other vessel from any foreign port or place to enter any port of the United States, except in accordance with the provisions of this act and with such rules and regulations of State and municipal health authorities as may be made in pursuance of, or consistent with, this act; and any such vessel which shall enter, or attempt to enter, a port of the United States in violation thereof shall forfeit to the United States a sum, to be awarded in the discretion of the court, not exceeding five thousand dollars, which shall be a lien upon said vessel, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

SEC. 2. That any vessel at any foreign port clearing for any port or place in the United States shall be required to obtain from the consul, vice-consul, or other consular officer of the United States at the port of departure, or from the medical officer, where such officer has been detailed by the President for that purpose, a bill of health, in duplicate, in the form prescribed by the Secretary of the Treasury, setting forth the sanitary history and condition of said vessel, and that it has in all respects complied with the rules and regulations in such cases prescribed for securing the best sanitary condition of the said vessel, its cargo, passengers, and crew; and said consular or medical officer is required, before granting such duplicate bill of health, to be satisfied that the matters and things therein stated are true; and for his services in that behalf he shall be entitled to demand and receive such fees as shall by lawful regulation be allowed, to be accounted for as is required in other cases.

The President, in his discretion, is authorized to detail any medical officer of the Government to serve in the office of the consul at any foreign port for the purpose of furnishing information and making the inspection and giving the bills of health hereinbefore mentioned. Any vessel clearing and sailing from any such port without such bill of health, and entering any port of the United States, shall forfeit to the United States not more than five thousand dollars, the amount to be determined by the court, which shall be a lien on the same, to be recovered by proceedings in the proper district court of the United States. In all such proceedings the United States district attorney for such district shall appear on behalf of the United States; and all such proceedings shall be conducted in accordance with the rules and laws governing cases of seizure of vessels for violation of the revenue laws of the United States.

The provisions of this section shall not apply to vessels plying between foreign ports on or near the frontiers of the United States and ports of the United States adjacent thereto; but the Secretary of the Treasury is hereby authorized, when, in his discretion, it is expedient for the preservation of the public health, to establish regulations governing such vessels.

SEC. 5. That the Secretary of the Treasury shall from time to time issue to the consular officers of the United States and to the medical officer serving at any foreign port, and otherwise make publicly known, the rules and regulations made by him, to be used and complied with by vessels in foreign ports, for securing the best sanitary condition of such vessels, their cargoes, passengers, and crew, before their departure for any port in the United States, and in the course of the voyage; and all such other rules and regulations as shall be observed in the inspection of the same on the arrival thereof at any quarantine station at the port of destination, and for the disinfection and isolation of the same, and the treatment of cargo and persons on board, so as to prevent the introduction of cholera, yellow fever, or other contagious or infectious diseases; and it shall not be lawful for any vessel to enter said port to discharge its cargo, or land its passengers, except upon a certificate of the health officer at such quarantine station certifying that said rules and regulations have in all respects been

observed and complied with, as well on his part as on the part of the said vessel and its master, in respect to the same and to its cargo, passengers, and crew; and the master of every such vessel shall produce and deliver to the collector of customs at said port of entry, together with the other papers of the vessel, the said bills of health required to be obtained at the port of departure and the certificates herein required to be obtained from the health officer at the port of entry and that the bills of health herein prescribed shall be considered as part of the ship's papers, and when duly certified to by the proper consular or other officer of the United States, over his official signature and seal, shall be accepted as evidence of the statements therein contained in any court of the United States.

SEC. 6. That on the arrival of an infected vessel at any port not provided with facilities for treatment of the same, the Secretary of the Treasury may remand said vessel, at its own expense, to the nearest national or other quarantine station, where accommodations and appliances are provided for the necessary disinfection and treatment of the vessel, passengers, and cargo; and after treatment of any infected vessel at a national quarantine station, and after certificate shall have been given by the United States quarantine officer at said station that the vessel, cargo, and passengers are each and all free from infectious disease, or danger of conveying the same, said vessel shall be admitted to entry to any port of the United States named within the certificate. But at any ports where sufficient quarantine provision has been made by State or local authorities the Secretary of the Treasury may direct vessels bound for said ports to undergo quarantine at said State or local station.

SEC. 7. That whenever it shall be shown to the satisfaction of the President, that by reason of the existence of cholera or other infectious or contagious diseases in a foreign country there is serious danger of the introduction of the same into the United States, and that notwithstanding the quarantine defense this danger is so increased by the introduction of persons or property from such country that a suspension of the right to introduce the same is demanded in the interest of the public health, the President shall have power to prohibit, in whole or in part, the introduction of persons and property from such countries or places as he shall designate, and for such period of time as he may deem necessary.

REVISED STATUTES.

[Extract from act August 1, 1888.]

Whenever any person shall trespass upon the grounds belonging to any quarantine reservation, * * * such person, trespassing, * * * shall, upon conviction thereof, pay a fine of not more than three hundred dollars, or be sentenced to imprisonment for a period of not more than thirty days, or shall be punished by both fine and imprisonment, at the discretion of the court. And it shall be the duty of the United States attorney in the district where the misdemeanor shall have been committed to take immediate cognizance of the offense, upon report made to him by any medical officer of the Marine-Hospital Service, or by any officer of the customs service, or by any State officer acting under authority of section five of said act.

QUARANTINE REGULATIONS TO BE OBSERVED AT FOREIGN PORTS AND AT SEA.

ARTICLE V.—PASSENGERS AND CREW.

PAR. 15. In a port where cholera prevails, or where yellow fever prevails in epidemic form, the crews of passenger ships should remain on board during their stay. Should additional men be shipped, the same precautions should be observed with them as in the case of steerage passengers. If it is considered necessary, the crews of freight ships may be similarly treated at the discretion of the medical officer.

PAR. 17. American vessels bound for the United States, or for Porto Rico, or for Cuba, shall not ship men in ports of Cuba or Porto Rico where smallpox or yellow fever prevails, unless such men have been inspected and passed by the quarantine officer.

ARTICLE VI.—REQUIREMENTS AT SEA.

PAR. 1. The master of the vessel should cause the following rules (which comprise those recommended by the International Conference at Rome, 1885) to be observed during the voyage.

(*a*) The soiled body linen of passengers and crew suffering from infectious disease should be at once immersed in boiling water or in a disinfecting solution.

(*b*) The water-closets should be washed and disinfected twice a day.

(*c*) Rigorous cleanliness and free ventilation should be maintained during the voyage on board all ships.

PAR. 2. An inspection of the vessel, including the steerage, should be made by the ship's physician once each day.

PAR. 3. Should cholera (or cholerine), yellow fever, typhus fever, or smallpox appear on board a ship while at sea, those who first show symptoms of these diseases will be immediately sent to the hospital; the ship's physician will then immediately notify the captain, and all of the effects liable to convey infection which have been in use will be destroyed or disinfected.

PAR. 4. The compartments occupied by those who fall sick with infectious disease should be disinfected, and, as far as possible, the compartments thus disinfected should be freely exposed to the air. If the vessel is an iron steamer and the compartments suitable, the entire compartment should be disinfected by steam. The articles liable to convey infection should remain in the compartments during the disinfection. After disinfection of the compartments the bedding and clothing may be removed and dried.

PAR. 5. Patients with infectious disease should be isolated.

PAR. 6. The hospital should be disinfected as soon as it becomes vacant.

PAR. 7. The dead should be enveloped in a sheet saturated with one of the strong disinfecting solutions, without previous washing of the body, and at once placed in a coffin hermetically sealed or buried at sea.

PAR. 8. A clinical record should be kept on the prescribed form, by the ship's surgeon, of all cases of sickness on board, and delivered to the quarantine officer at the port of arrival.

PAR. 9. Under the foregoing paragraphs disinfecting solutions are limited to the following: Strong: acid solution of bichloride of mercury (1 to 500); a 1 to 20 solution of pure carbolic acid. Weak: acid solution of bichloride of mercury (1 to 1,000); pure carbolic acid, 1 to 40.

QUARANTINE REGULATIONS TO BE OBSERVED AT PORTS AND ON THE FRONTIERS OF THE UNITED STATES.

(*Extracts.*)

ARTICLE I.—INSPECTION.

1. Vessels arriving at ports of the United States under the following conditions shall be inspected by a quarantine officer prior to entry.

A. Any vessel with sickness on board.

B. All vessels from foreign ports.

C. Vessels from domestic ports where cholera or yellow fever prevails or where smallpox or typhus fever prevails in epidemic form.

EXCEPTIONS.—Vessels not carrying passengers on inland waters of the United States. Vessels from the Pacific and Atlantic coast of British America, provided they do not carry persons or effects of persons nonresident in America for the sixty days next preceding arrival, and provided always that the port of departure be free from quarantinable disease. Vessels from other foreign ports via these excepted ports shall be inspected.

D. Vessels from foreign ports carrying passengers having entered a port of the United States without complete discharge of passengers and cargo. Such vessels shall be subject to a second inspection before entering any other port. Vessels from ports suspected of infection with yellow fever, having entered a port north of the southern boundary of Maryland without disinfection, shall be subjected to a second inspection before entering any port south of said latitude during the quarantine season of such port.

2. The inspections of vessels required by these regulations shall be made by daylight, except in case of vessels in distress.

3. In making the inspection of a vessel, the bill of health and clinical record of all cases treated during the voyage, crew and passengers' lists and manifests, and, when necessary, the ship's log shall be examined. The crew and passengers shall be mustered and examined and compared with the lists and manifests, and any discrepancies investigated.

4. No person except the quarantine officer, his employés, United States customs officers, or agents of the vessel, shall be permitted to board any vessel subject to quarantine inspection, until after the vessel has been inspected by the quarantine officer and given its discharge.

5. Tugboats or any other vessels having had communication with vessels subject to inspection, shall be themselves subject to inspection.

ARTICLE II—QUARANTINE.

1. For the purpose of these regulations, the quarantinable diseases are cholera (cholerine), yellow fever, smallpox, typhus fever, and leprosy.

2. Vessels arriving under the following conditions shall be placed in quarantine:

A. With quarantinable disease on board.

B. Having had such on board during the voyage or within thirty days next preceding arrival; or, if arriving in the quarantine season, having had yellow fever on board after March 1 of the current year, unless satisfactorily disinfected thereafter.

C. From ports infected with cholera, or where typhus fever prevails in epidemic form, coming directly or via another foreign port, or via United States ports, unless they have complied with the United States quarantine regulations for foreign ports, also vessels from noninfected ports but bringing persons or cargo from places infected with cholera, yellow fever, or where typhus fever prevails in epidemic form, except as subsequently noted.

D. From ports where yellow fever prevails, unless disinfected in accordance with these regulations, and not less than five days have elapsed since such disinfection.

E. Tugboats and other vessels having had communication with vessels subject to quarantine, shall be quarantined if they have been exposed to infection.

EXCEPTIONS.—The following exceptions may be made to Rules C and D with regard to vessels from ports quarantined against on account of yellow fever:

(1) Vessels arriving during certain seasons of the year, to wit, from November 15 to April 1, may be admitted to entry.

(2) Vessels bound for ports in the United States north of the southern boundary of Maryland, with good sanitary condition and history, having had no sickness on board at ports of departure en route or on arrival, provided they have been five days from last infected or suspected port, may be allowed entry at port of destination. But if said vessels carry passengers destined for places south of this latitude the baggage of said passengers shall be disinfected.

(3) Vessels engaged in the fruit trade from ports declared safe for this purpose by the supervising surgeon-general M. H. S. may be admitted to entry without detention, provided that they carry no passengers and have carried no passengers from one port to another, and have no household effects or personal baggage in cargo, and have complied with the special rules and regulations made by the Secretary of the Treasury with regard to vessels engaged in said trade.

ARTICLE III.—GENERAL REQUIREMENTS AT QUARANTINES.

1. Pilots bringing infected vessels will be detained in quarantine a sufficient time to cover the period of incubation of the disease for which the vessel is quarantined, if, in the opinion of the quarantine officer, such pilots have been exposed to infection. The dunnage of pilots shall be disinfected when necessary.

2. No direct communication shall be allowed between quarantine, or any vessel in quarantine, and any person or place outside, and no communication except under the supervision of the quarantine officer.

3. No ballast shall be allowed to leave the quarantine station, unless disinfected.

4. Where it is impossible to disinfect cargo *in situ*, it shall be removed and disinfected in the manner provided for articles of their class in these regulations; such articles to be unpacked and so arranged as to allow the disinfectant used to reach every part of all surfaces of said articles.

5. Vessels arriving at any port of the United States, having cholera or yellow fever aboard during the quarantine season, shall be remanded to an anchorage set apart for infected vessels, and there to remain until after the discharge of the passengers and purification of the vessel.

6. All passenger baggage disinfected under the requirements of these regulations shall be labeled.

APPENDIX V.

RULES TO PREVENT COLLISIONS OF VESSELS.

Compiled for insertion in volumes of the U. S. Coast Pilot, Atlantic Coast.

AN ACT in regard to collisions at sea.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That in every case of collision between two vessels it shall be the duty of the master or person in charge of each vessel, if and so far as he can do so without serious danger to his own vessel, crew, and passengers (if any), to stay by the other vessel until he has ascertained that she has no need of further assistance, and to render to the other vessel, her master, crew, and passengers (if any), such assistance as may be practicable and as may be necessary in order to save them from any danger caused by the collision, and also to give to the master or person in charge of the other vessel the name of his own vessel and her port of registry, or the port or place to which she belongs, and also the names of the ports and places from which and to which she is bound. If he fails so to do, and no reasonable cause for such failure is shown, the collision shall, in the absence of proof to the contrary, be deemed to have been caused by his wrongful act, neglect, or default.

SEC. 2. That every master or person in charge of a United States vessel who fails, without reasonable cause, to render such assistance or give such information as aforesaid shall be deemed guilty of a misdemeanor, and shall be liable to a penalty of one thousand dollars, or imprisonment for a term not exceeding two years; and for the above sum the vessel shall be liable and may be seized and proceeded against by process in any district court of the United States by any person; one-half such sum to be payable to the informer and the other half to the United States.

SEC. 3. That this act shall take effect at a time to be fixed by the President by Proclamation issued for that purpose.

Approved, September 4, 1890. Proclamation dated Nov. 18, 1890, to take effect Dec. 15, 1890.

INTERNATIONAL RULES.

I.—ENACTING CLAUSE, AND SCOPE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collisions at sea shall be followed by all public and private vessels of the United States upon the high seas and in all waters connected therewith, navigable by sea-going vessels.

ART. 30. Nothing in these rules shall interfere with the operation of a special rule, duly made by local authority, relative to the navigation of any harbor, river, or inland waters.

PRELIMINARY DEFINITIONS.

In the following rules every steam-vessel which is under sail and not under steam is to be considered a sailing-vessel, and every vessel under steam, whether under sail or not, is to be considered a steam-vessel.

The word "steam-vessel" shall include any vessel propelled by machinery.

A vessel is "under way" within the meaning of these rules when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules when applied to lights shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2. A steam-vessel when under way shall carry—(*a*) On or in front of the foremast, or if a vessel without a foremast, then in the fore part of the vessel, at a height above the hull of not less than twenty feet, and if the breadth of the vessel exceeds twenty feet, then at a height above the hull not less than such breadth, so, however, that the light need not be carried at a greater height above the hull than forty feet, a bright white light, so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A steam-vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower light shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam-vessel when towing another uessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than six feet apart, and when towing more than one vessel shall carry an additional bright white light six feet above or below such light, if the length of the tow measuring from the stern of the towing vessel to the stern of the last vessel towed exceeds six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article 2 (*a*), excepting the additional light, which may be carried at a height of not less than fourteen feet above the hull.

Such steam-vessel may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

SPECIAL LIGHTS.

ART. 4 (*a*) A vessel which from any accident is not under command shall carry at the same height as a white light mentioned in article two (*a*), where they can best be seen, and if a steam-vessel in lieu of that light, two red lights in a vertical line one over the other, not less than six feet apart, and of such a character as to be visible all around the horizon at a distance of at least two miles; and shall by day carry in a vertical line one over the other, not less than six feet apart, where they can best be seen, two black balls or shapes, each two feet in diameter.

(*b*) A vessel employed in laying or in picking up a telegraph cable shall carry in the same position as the white light mentioned in article two (*a*), and if a steam-vessel, in lieu of that light, three lights in a vertical line one over the other not less than six feet apart. The highest and lowest of these lights shall be red, and the middle light shall be white, and they shall be of such a character as to be visible all around the horizon at a distance of at least two miles. By day she shall carry in a vertical line, one over the other, not less than six feet apart, where they can best be seen, three shapes not less than two feet in diameter, of which the highest and lowest shall be globular in shape and red in color, and the middle one diamond in shape and white.

(*c*) The vessels referred to in this article, when not making way through the water, shall not carry the side-lights, but when making way shall carry them.

(*d*) The lights and shapes required to be shown by this article are to be taken by other vessels as signals that the vessel showing them is not under command and can not therefore get out of the way.

These signals are not signals of vessels in distress and requiring assistance. Such signals are contained in article thirty-one.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing vessel under way and any vessel being towed shall carry the same lights as are prescribed by article two for a steam-vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of small vessels under way during bad weather, the green and red side-lights can not be fixed, these lights shall be kept at hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR SMALL STEAM AND SAIL VESSELS AND OPEN BOATS.

ART. 7. Steam-vessels of less than forty, and vessels under oars, or sails of less than twenty tons gross tonnage, respectively, and rowing boats, when under way, shall not be required to carry the lights mentioned in article two (*a*), (*b*), and (*c*), but if they do not carry them they shall be provided with the following lights:

First. Steam-vessels of less than forty tons shall carry—

(*a*) In the fore part of the vessel, or on or in front of the funnel, where it can best be seen, and at a height above the gunwale of not less than nine feet, a bright white light constructed and fixed as prescribed in article two (*a*), and of such a character as to be visible at a distance of at least two miles.

(*b*) Green and red side-lights constructed and fixed as prescribed in article two (*b*) and (*c*), and of such a character as to be visible at a distance of at least one mile, or a combined lantern showing a green light and a red light from right ahead to two points abaft the beam on their respective sides. Such lanterns shall be carried not less than three feet below the white light.

Second. Small steamboats, such as are carried by seagoing vessels, may carry the white light at a less height than nine feet above the gunwale, but it shall be carried above the combined lantern mentioned in subdivision one (*b*).

Third. Vessels under oars or sails of less than twenty tons shall have ready at hand a lantern with a green glass on one side and a red glass on the other, which, on the approach of or to other vessels, shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

Fourth. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

The vessels referred to in this article shall not be obliged to carry the lights prescribed by article four (*a*) and article eleven, last paragraph.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot-vessels when engaged on their station on pilotage duty shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals, which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side-lights lighted, ready for use, and shall flash or show them at short intervals, to indicate the direction in which they are heading, but the green light shall not be shown on the port side, nor the red light on the starboard side.

A pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand, ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot-vessels when not engaged on their station on pilotage duty shall carry lights similar to those of other vessels of their tonnage.

A steam pilot-vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot-boats, carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry in addition to the lights required for all pilot boats the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. [*Article 9, act of August 19, 1890, was repealed by act of May 28, 1894, and article 10, act of March 3, 1885, was reenacted in part by act of August 13, 1894, and is reproduced here in part as article 9. It will be the object of further consideration by the maritime powers:*]

Fishing-vessels of less than twenty tons net registered tonnage, when under way and when not having their nets, trawls, dredges or lines in the water, shall not be obliged to carry the colored sight-lights; but every such vessel shall in lieu thereof have ready at hand a lantern with a green glass on the one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

The following portion of this article applies only to fishing-vessels and boats when in the sea off the coast of Europe lying north of Cape Finisterre:

(*a*) All fishing-vessels and fishing-boats of twenty tons net registered tonnage or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*b*) All vessels when engaged in fishing with drift nets shall exhibit two white lights from any part of the vessel where they can be best seen. Such lights shall be placed so that the vertical distance between them shall be not less than six feet and not more than ten feet, and so that the horizontal distance between them, measured in a line with the keel of the vessel, shall be not less than five feet and not more than ten feet. The lower of these two lights shall be the more forward, and both of them shall be of such a character and contained in lanterns of such construction as to show all around the horizon, on a dark night, with a clear atmosphere, for a distance of not less than three miles.

(*c*) All vessels when trawling, dredging, or fishing with any kind of drag-nets shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, on a dark night, with a clear atmosphere, the white light to a distance of not less than three miles and the red light of not less than two miles.

(*d*) A vessel employed in line-fishing, with her lines out, shall carry the same lights as a vessel when engaged in fishing with drift nets.

(*e*) If a vessel, when fishing with a trawl, dredge, or any kind of drag-net, becomes stationary in consequence of her gear getting fast to a rock or other obstruction, she shall show the light and make the fog signal for a vessel at anchor.

(*f*) Fishing-vessels may at any time use a flare-up in addition to the lights which they are by this article required to carry and show. All flare-up lights exhibited by a vessel when trawling, dredging, or fishing with any kind of drag-net shall be shown at the after-part of the vessel, excepting that if the vessel is hanging by the stern to her trawl, dredge, or drag net they shall be exhibited from the bow.

(*g*) Every fishing-vessel when at anchor between sunset and sunrise shall exhibit a white light, visible all around the horizon at a distance of at least one mile.

(*h*) In a fog a drift-net vessel attached to her nets, and a vessel when trawling, dredging, or fishing with any kind of drag-net, and a vessel employed in line-fishing with her lines out, shall, at intervals of not more than two minutes, make a blast with her fog horn and ring her bell alternately.

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

The white light required to be shown by this article may be fixed and carried in a lantern, but in such case the lantern shall be so constructed, fitted, and screened that it shall

throw an unbroken light over an arc of the horizon of twelve points of the compass, namely, for six points from right aft on each side of the vessel, so as to be visible at a distance of at least one mile. Such lights shall be carried as nearly as practicable on the same level as the side lights.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length, when at anchor, shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length, when at anchor, shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light, and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

A vessel aground in or near a fair-way shall carry the above light or lights and the two red lights prescribed by article four (*a*).

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments and duly registered and published.

STEAM VESSEL UNDER SAIL BY DAY.

ART. 14. A steam-vessel proceeding under sail only but having her funnel up, shall carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS IN FOG, ETC.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

First. By "steam-vessels" on the whistle or siren.

Second. By "sailing-vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn, to be sounded by mechanical means, and also with an efficient bell. (In all cases where the rules require a bell to be used, a drum may be substituted on board Turkish vessels, or a gong where such articles are used on board small seagoing vessels.) A sailing-vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel having way upon her shall sound, at intervals of not more than two minutes, a prolonged blast.

(*b*) A steam-vessel under way, but stopped, and having no way upon her, shall sound, at intervals of not more than two minutes, two prolonged blasts, with an interval of about one second between.

SAIL VESSEL UNDER WAY.

(*c*) A sailing vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, ETC.

(*e*) A vessel when towing, a vessel employed in laying or picking up a telegraph cable, and a vessel under way, which is unable to get out of the way of an approaching vessel through being not under command, or unable to maneuver as required by the rules, shall, instead of the signals prescribed in subdivisions (*a*) and (*c*) of this article, at intervals of not more than two minutes, sound three blasts in succession, namely: One prolonged blast followed by short blasts. A vessel towed may give this signal and she shall not give any other.

SMALL SAILING VESSELS AND BOATS.

Sailing vessels and boats of less than twenty tons gross tonnage shall not be obliged to give the above-mentioned signals, but, if they do not, they shall make some other efficient sound signal at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain-storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam-vessel hearing, apparently forward of her beam, the fog-signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances permit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing-vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other, as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. When two steam-vessels are meeting end on, or nearly end on, so as to involve risk of collision, each shall alter her course to starboard, so that each may pass on the port side of the other.

This article only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision, and does not apply to two vessels which must, if both keep on their respective courses, pass clear of each other.

The only cases to which it does apply are when each of the two vessels is end on, or nearly end on, to the other; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own; and by night, to cases in which each vessel is in such a position as to see both the side-lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course; or by night, to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light, or a green light without a red light, is seen ahead, or where both green and red lights are seen anywhere but ahead.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSEL.

ART. 20. When a steam-vessel and a sailing-vessel are proceeding in such directions as to involve risk of collision, the steam vessel shall keep out of the way of the sailing vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of two vessels is to keep out of the way, the other shall keep her course and speed.

NOTE.—When in consequence of thick weather or other causes, such vessel finds herself so close that collision can not be avoided by the action of the giving-away vessel alone, she also shall take such action as will best aid to avert collision. (See articles twenty-seven and twenty-nine.)

CROSSING AHEAD.

ART. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED AND STOP.

ART. 23. Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules every vessel, overtaking any other, shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position, with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vessel can not always know with certainty whether she is forward of or abaft this direction from the other vessel, she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS OF WAY OF FISHING VESSELS.

ART. 26. Sailing vessels under way shall keep out of the way of sailing vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR PASSING STEAMERS.

ART. 28. The words "short blasts," used in this article, shall mean a blast of about one second's duration.

When vessels are in sight of one another, a steam vessel under way, in taking any course authorized or required by these rules, shall indicate that course by the following signals on her whistle or siren, namely:

One short blast to mean, "I am directing my course to starboard."

Two short blasts to mean, "I am directing my course to port."

Three short blasts to mean, "My engines are going at full speed astern."

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See p. 175.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. The international code signal of distress indicated by N. C.

Third. The distance signal, consisting of a square flag, having either above or below it a ball or anything resembling a ball.

Fourth. A continuous sounding with any fog-signal apparatus.

At night—

First. A gun or other explosive signal fired at intervals of about a minute.

Second. Flames on the vessel (as from a burning tar barrel, oil barrel, and so forth).

Third. Rockets or shells throwing stars of any color or description, fired one at a time, at short intervals.

Fourth. A continuous sounding with any fog-signal apparatus.

INLAND RULES.

NOTE.—*The paragraphs indicated by a vertical line are identically the same as corresponding paragraphs in the International Rules.*

I.—ENACTING CLAUSE AND SCOPE.

Be it enacted by the Senate and House of Representatives of the United States of America in Congress assembled, That the following regulations for preventing collision shall be followed by all vessels navigating all harbors, rivers, and inland waters of the United States, except the Great Lakes and their connecting and tributary waters as far east as Montreal, and the Red River of the North and rivers emptying into the Gulf of Mexico and their tributaries, and are hereby declared special rules duly made by local authority:

ART. 30. The exhibition of any light on board of a vessel of war of the United States or a revenue cutter may be suspended whenever, in the opinion of the Secretary of the Navy, the commander in chief of a squadron, or the commander of a vessel acting singly, the special character of the service may require it.

PRELIMINARY DEFINITIONS.

In the following rules every steam-vessel which is under sail and not under steam is to be considered a sailing-vessel, and every vessel under steam, whether under sail or not, is to be considered a steam-vessel.

The word "steam-vessel" shall include any vessel propelled by machinery.

A vessel is "under way," within the meaning of these rules, when she is not at anchor, or made fast to the shore, or aground.

II.—LIGHTS AND SO FORTH.

The word "visible" in these rules, when applied to lights, shall mean visible on a dark night with a clear atmosphere.

ART. 1. The rules concerning lights shall be complied with in all weathers from sunset to sunrise, and during such time no other lights which may be mistaken for the prescribed lights shall be exhibited.

STEAM VESSELS—MASTHEAD LIGHT.

ART. 2. A steam-vessel when under way shall carry (*a*) on or in front of the foremast, or, if a vessel without a foremast, then in the fore part of the vessel, a bright white light so constructed as to show an unbroken light over an arc of the horizon of twenty points of the compass, so fixed as to throw the light ten points on each side of the vessel, namely, from right ahead to two points abaft the beam on either side, and of such a character as to be visible at a distance of at least five miles.

STEAM VESSELS—SIDE LIGHTS.

(*b*) On the starboard side a green light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the starboard side, and of such a character as to be visible at a distance of at least two miles.

(*c*) On the port side a red light so constructed as to show an unbroken light over an arc of the horizon of ten points of the compass, so fixed as to throw the light from right ahead to two points abaft the beam on the port side, and of such a character as to be visible at a distance of at least two miles.

(*d*) The said green and red side-lights shall be fitted with inboard screens projecting at least three feet forward from the light, so as to prevent these lights from being seen across the bow.

STEAM VESSELS—RANGE LIGHTS.

(*e*) A sea-going steam-vessel when under way may carry an additional white light similar in construction to the light mentioned in subdivision (*a*). These two lights shall be so placed in line with the keel that one shall be at least fifteen feet higher than the other, and in such a position with reference to each other that the lower lights shall be forward of the upper one. The vertical distance between these lights shall be less than the horizontal distance.

(*f*) All steam-vessels (except sea-going vessels and ferry-boats) shall carry in addition to green and red lights required by article two (*b*), (*c*), and screens as required by article two (*d*), a central range of two white lights; the after-light being carried at an elevation at least fifteen feet above the light at the head of the vessel. The head-light shall be so constructed as to show an unbroken light through twenty points of the compass, namely, from right ahead to two points abaft the beam on either side of the vessel, and the after-light so as to show all around the horizon.

STEAM VESSELS WHEN TOWING.

ART. 3. A steam-vessel when towing another vessel shall, in addition to her side-lights, carry two bright white lights in a vertical line one over the other, not less than three feet apart, and when towing more than one vessel shall carry an additional bright white light three feet above or below such lights, if the length of the tow, measuring from the stern of the towing vessel to the stern of the last vessel towed, exceeds six hundred feet. Each of these lights shall be of the same construction and character, and shall be carried in the same position as the white light mentioned in article two (*a*) or the after range light mentioned in article two (*f*).

Such steam-vessels may carry a small white light abaft the funnel or aftermast for the vessel towed to steer by, but such light shall not be visible forward of the beam.

LIGHTS FOR SAILING VESSELS AND VESSELS IN TOW.

ART. 5. A sailing-vessel under way or being towed shall carry the same lights as are prescribed by article two for a steam-vessel under way, with the exception of the white lights mentioned therein, which they shall never carry.

LIGHTS FOR SMALL VESSELS.

ART. 6. Whenever, as in the case of vessels of less than ten gross tons under way during bad weather, the green and red side lights can not be fixed, these lights shall be kept at hand, lighted and ready for use; and shall, on the approach of or to other vessels, be exhibited on their respective sides in sufficient time to prevent collision, in such manner as to make them most visible, and so that the green light shall not be seen on the port side nor the red light on the starboard side, nor, if practicable, more than two points abaft the beam on their respective sides. To make the use of these portable lights more certain and easy, the lanterns containing them shall each be painted outside with the color of the light they respectively contain, and shall be provided with proper screens.

LIGHTS FOR ROWING BOATS.

ART. 7. Rowing boats, whether under oars or sail, shall have ready at hand a lantern showing a white light which shall be temporarily exhibited in sufficient time to prevent collision.

LIGHTS FOR PILOT VESSELS.

ART. 8. Pilot-vessels, when engaged on their station on pilotage duty, shall not show the lights required for other vessels, but shall carry a white light at the masthead, visible all around the horizon, and shall also exhibit a flare-up light or flare-up lights at short intervals which shall never exceed fifteen minutes.

On the near approach of or to other vessels they shall have their side-lights lighted, ready for use, and shall flash or show them at short intervals to indicate the direction in which they are heading, but the green light shall not be shown on the port side nor the red light on the starboard side.

A pilot-vessel of such a class as to be obliged to go alongside of a vessel to put a pilot on board may show the white light instead of carrying it at the masthead, and may, instead of the colored lights above mentioned, have at hand ready for use, a lantern with a green glass on the one side and a red glass on the other, to be used as prescribed above.

Pilot vessels, when not engaged on their station on pilotage duty, shall carry lights similar to those of other vessels of their tonnage.

A steam pilot vessel, when engaged on her station on pilotage duty and in waters of the United States, and not at anchor, shall, in addition to the lights required for all pilot boats, carry at a distance of eight feet below her white masthead light a red light, visible all around the horizon and of such a character as to be visible on a dark night with a clear atmosphere at a distance of at least two miles, and also the colored lights required to be carried by vessels when under way.

When engaged on her station on pilotage duty and in waters of the United States, and at anchor, she shall carry, in addition to the lights required for all pilot boats, the red light above mentioned, but not the colored side lights.

When not engaged on her station on pilotage duty, she shall carry the same lights as other steam-vessels.

LIGHTS, ETC., OF FISHING VESSELS.

ART. 9. (*a*) Fishing-vessels of less than ten gross tons, when under way and when not having their nets, trawls, dredges, or lines in the water, shall not be obliged to carry the colored side-lights; but every such vessel shall, in lieu thereof, have ready at hand a lantern with a green glass on one side and a red glass on the other side, and on approaching to or being approached by another vessel such lantern shall be exhibited in sufficient time to prevent collision, so that the green light shall not be seen on the port side nor the red light on the starboard side.

(*b*) All fishing-vessels and fishing boats of ten gross tons or upward, when under way and when not having their nets, trawls, dredges, or lines in the water, shall carry and show the same lights as other vessels under way.

(*c*) All vessels, when trawling, dredging, or fishing with any kind of drag-nets or lines, shall exhibit, from some part of the vessel where they can be best seen, two lights. One of these lights shall be red and the other shall be white. The red light shall be above the white light, and shall be at a vertical distance from it of not less than six feet and not more than twelve feet; and the horizontal distance between them, if any, shall not be more than ten feet. These two lights shall be of such a character and contained in lanterns of such construction as to be visible all around the horizon, the white light a distance of not less than three miles and the red light of not less than two miles.

LIGHTS FOR RAFTS OR OTHER WATER CRAFT.

(*d*) Rafts, or other water craft not herein provided for, navigating by hand power, horse power, or by the current of the river, shall carry one or more good white lights, which shall be placed in such manner as shall be prescribed by the Board of Supervising Inspectors of Steam Vessels.*

---

* *Resolved*, That all coal boats, trading boats, produce boats, canal boats, oyster boats, fishing boats, and other water craft navigating any bay harbor, or river, propelled by hand power, horse power, sail, or by the current of the river, or which shall be moored in or near the channel or fairway of any bay, harbor, or river, shall carry one bright white light forward, not less than six feet above the rail or deck.

Rafts of one crib and not more than two in length shall carry one bright white light on a pole not less than twelve feet high; three or more cribs in length, shall carry one white light at each end of the raft at the same height. Boom rafts with cross binders towed ahead of steamers on the Mississippi and Ohio rivers, and other waters flowing into the Gulf of Mexico, and on the Red River of the North, shall carry a white light *twelve feet high* at the forward end of the raft, and one such light at each side midway between the forward and after end.

Rafts of more than one crib abreast shall carry one white light on each outside corner of the raft, making four lights in all. Bag or boom rafts navigating or anchored in the fairway of any bay, harbor, or river shall carry a white light at least twelve feet high at each end of the raft, and one of such lights on each side midway between the forward and after end.

Rowboats shall carry one white light two feet above the stem.

JAS. A. DUMONT,
Supervising Inspector General,
President Board of Supervising Inspectors.

Approved, February 16, 1891.

A. B. NETTLETON,
Acting Secretary.

LIGHTS FOR AN OVERTAKEN VESSEL.

ART. 10. A vessel which is being overtaken by another, except a steam-vessel with an after range-light showing all around the horizon, shall show from her stern to such last-mentioned vessel a white light or a flare-up light.

ANCHOR LIGHTS.

ART. 11. A vessel under one hundred and fifty feet in length when at anchor shall carry forward, where it can best be seen, but at a height not exceeding twenty feet above the hull, a white light, in a lantern so constructed as to show a clear, uniform, and unbroken light visible all around the horizon at a distance of at least one mile.

A vessel of one hundred and fifty feet or upward in length when at anchor shall carry in the forward part of the vessel, at a height of not less than twenty and not exceeding forty feet above the hull, one such light; and at or near the stern of the vessel, and at such a height that it shall be not less than fifteen feet lower than the forward light, another such light.

The length of a vessel shall be deemed to be the length appearing in her certificate of registry.

SPECIAL SIGNALS.

ART. 12. Every vessel may, if necessary, in order to attract attention, in addition to the lights which she is by these rules required to carry, show a flare-up light or use any detonating signal that can not be mistaken for a distress signal.

NAVAL LIGHTS AND RECOGNITION SIGNALS.

ART. 13. Nothing in these rules shall interfere with the operation of any special rules made by the Government of any nation with respect to additional station and signal lights for two or more ships of war or for vessels sailing under convoy, or with the exhibition of recognition signals adopted by shipowners, which have been authorized by their respective Governments, and duly registered and published.

STEAM VESSELS UNDER SAIL BY DAY.

ART. 14. A steam-vessel proceeding under sail only, but having her funnel up, may carry in daytime, forward, where it can best be seen, one black ball or shape two feet in diameter.

III.—SOUND SIGNALS IN FOG, ETC.

PRELIMINARY.

ART. 15. All signals prescribed by this article for vessels under way shall be given:

1. By "steam-vessels" on the whistle or siren.
2. By "sailing-vessels" and "vessels towed" on the fog horn.

The words "prolonged blast" used in this article shall mean a blast of from four to six seconds' duration.

A steam-vessel shall be provided with an efficient whistle or siren, sounded by steam or by some substitute for steam, so placed that the sound may not be intercepted by any obstruction, and with an efficient fog horn; also with an efficient bell. A sailing-vessel of twenty tons gross tonnage or upward shall be provided with a similar fog horn and bell.

In fog, mist, falling snow, or heavy rain-storms, whether by day or night, the signals described in this article shall be used as follows, namely:

STEAM VESSEL UNDER WAY.

(*a*) A steam-vessel under way shall sound, at intervals of not more than one minute, a prolonged blast.

SAIL VESSEL UNDER WAY.

(*c*) A sailing-vessel under way shall sound, at intervals of not more than one minute, when on the starboard tack, one blast; when on the port tack, two blasts in succession, and when with the wind abaft the beam, three blasts in succession.

VESSELS AT ANCHOR OR NOT UNDER WAY.

(*d*) A vessel when at anchor shall, at intervals of not more than one minute, ring the bell rapidly for about five seconds.

VESSELS TOWING, ETC.

(*e*) A steam-vessel when towing, shall, instead of the signals prescribed in subdivision (*a*) of this article, at intervals of not more than one minute, sound three blasts in succession, namely, one prolonged blast followed by two short blasts. A vessel towed may give this signal and she shall not give any other.

RAFTS OR OTHER WATER CRAFT.

(*f*) All rafts or other water craft, not herein provided for, navigating by hand power, horse power, or by the current of the river, shall sound a blast of the fog horn, or equivalent signal, at intervals of not more than one minute.

SPEED IN FOG.

ART. 16. Every vessel shall, in a fog, mist, falling snow, or heavy rain-storms, go at a moderate speed, having careful regard to the existing circumstances and conditions.

A steam-vessel hearing, apparently forward of her beam, the fog-signal of a vessel, the position of which is not ascertained, shall, so far as the circumstances of the case admit, stop her engines, and then navigate with caution until danger of collision is over.

IV.—STEERING AND SAILING RULES.

PRELIMINARY.

Risk of collision can, when circumstances premit, be ascertained by carefully watching the compass bearing of an approaching vessel. If the bearing does not appreciably change, such risk should be deemed to exist.

SAILING VESSELS.

ART. 17. When two sailing-vessels are approaching one another, so as to involve risk of collision, one of them shall keep out of the way of the other as follows, namely:

(*a*) A vessel which is running free shall keep out of the way of a vessel which is close-hauled.

(*b*) A vessel which is close-hauled on the port tack shall keep out of the way of a vessel which is close-hauled on the starboard tack.

(*c*) When both are running free, with the wind on different sides, the vessel which has the wind on the port side shall keep out of the way of the other.

(*d*) When both are running free, with the wind on the same side, the vessel which is to the windward shall keep out of the way of the vessel which is to the leeward.

(*e*) A vessel which has the wind aft shall keep out of the way of the other vessel.

STEAM VESSELS.

ART. 18. RULE I. When steam-vessels are approaching each other head and head, that is, end on, or nearly so, it shall be the duty of each to pass on the port side of the other; and either vessel shall give, as a signal of her intention, one short and distinct blast of her whistle, which the other vessel shall answer promptly by a similar blast of her whistle, and thereupon such vessels shall pass on the port side of each other. But if the courses of such vessels are so far on the starboard of each other as not to be considered as meeting head and head, either vessel shall immediately give two short and distinct blasts of her whistle, which the other vessel shall answer promptly by two similar blasts of her whistle, and they shall pass on the starboard side of each other.

The foregoing only applies to cases where vessels are meeting end on, or nearly end on, in such a manner as to involve risk of collision; in other words, to cases in which, by day, each vessel sees the masts of the other in a line, or nearly in a line, with her own, and by night to cases in which each vessel is in such a position as to see both the side lights of the other.

It does not apply by day to cases in which a vessel sees another ahead crossing her own course, or by night to cases where the red light of one vessel is opposed to the red light of the other, or where the green light of one vessel is opposed to the green light of the other, or where a red light without a green light or a green light without a red light is seen ahead, or where both green and red lights are seen anywhere but ahead.

RULE III. If, when steam-vessels are approaching each other, either vessel fails to understand the course or intention of the other, from any cause, the vessel so in doubt shall immediately signify the same by giving several short and rapid blasts, not less than four, of the steam-whistle.

RULE V. Whenever a steam-vessel is nearing a short bend or curve in the channel, where, from the height of the banks or other cause, a steam-vessel approaching from the opposite direction can not be seen for a distance of half a mile, such steam-vessel, when she shall have arrived within half a mile of such curve or bend, shall give a signal by one long blast of the steam-whistle, which signal shall be answered by a similar blast, given by any approaching steam-vessel that may be within hearing. Should such a signal be so answered by a steam-vessel upon the farther side of such bend, then the usual signals for meeting and passing shall immediately be given and answered; but, if the first alarm signal of such vessel be not answered, she is to consider the channel clear and govern herself accordingly.

When steam-vessels are moved from their docks or berths, and other boats are liable to pass from any direction toward them, they shall give the same signal as in the case of vessels meeting at a bend, but immediately after clearing the berths so as to be fully in sight they shall be governed by the steering and sailing rules.

RULE VIII. When steam-vessels are running in the same direction, and the vessel which is astern shall desire to pass on the right or starboard hand of the vessel ahead, she shall give one short blast of the steam-whistle, as a signal of such desire, and if the vessel ahead answers with one blast, she shall put her helm to port; or if she shall desire to pass on the left or port side of the vessel ahead, she shall give two short blasts of the steam-whistle as a signal of such desire, and if the vessel ahead answers with two blasts, shall put her helm to starboard; or if the vessel ahead does not think it safe for the vessel astern to attempt to pass at that point, she shall immediately signify the same by giving several short and rapid blasts of the steam whistle, not less than four, and under no circumstances shall the vessel astern attempt to pass the vessel ahead until such time as they have reached a point where it can be safely done, when said vessel ahead shall signify her willingness by blowing the proper signals. The vessel ahead shall in no case attempt to cross the bow or crowd upon the course of the passing vessel.

RULE IX. The whistle signals provided in the rules under this article for steam-vessels meeting, passing, or overtaking, are never to be used except when steamers are in sight of each other, and the course and position of each can be determined in the daytime by a sight of the vessel itself, or by night by seeing its signal lights. In fog, mist, falling snow, or heavy rain-storms, when vessels can not so see each other, fog-signals only must be given.

TWO STEAM VESSELS CROSSING.

ART. 19. When two steam-vessels are crossing, so as to involve risk of collision, the vessel which has the other on her own starboard side shall keep out of the way of the other.

STEAM VESSEL SHALL KEEP OUT OF THE WAY OF SAILING VESSEL.

ART. 20. When a steam-vessel and a sailing-vessel are proceeding in such directions as to involve risk of collision, the steam-vessel shall keep out of the way of the sailing-vessel.

COURSE AND SPEED.

ART. 21. Where, by any of these rules, one of the two vessels is to keep out of the way, the other shall keep her course and speed.

CROSSING AHEAD.

ART. 22. Every vessel which is directed by these rules to keep out of the way of another vessel shall, if the circumstances of the case admit, avoid crossing ahead of the other.

STEAM VESSEL SHALL SLACKEN SPEED OR STOP.

ART. 23. Every steam-vessel which is directed by these rules to keep out of the way of another vessel shall, on approaching her, if necessary, slacken her speed or stop or reverse.

OVERTAKING VESSELS.

ART. 24. Notwithstanding anything contained in these rules, every vessel overtaking any other shall keep out of the way of the overtaken vessel.

Every vessel coming up with another vessel from any direction more than two points abaft her beam, that is, in such a position with reference to the vessel which she is overtaking that at night she would be unable to see either of that vessel's side-lights, shall be deemed to be an overtaking vessel; and no subsequent alteration of the bearing between the two vessels shall make the overtaking vessel a crossing vessel within the meaning of these rules, or relieve her of the duty of keeping clear of the overtaken vessel until she is finally past and clear.

As by day the overtaking vesssel can not always know with certainty whether she is forward of or abaft this direction from the other vessel she should, if in doubt, assume that she is an overtaking vessel and keep out of the way.

NARROW CHANNELS.

ART. 25. In narrow channels every steam-vessel shall, when it is safe and practicable, keep to that side of the fair-way or mid-channel which lies on the starboard side of such vessel.

RIGHTS OF WAY OF FISHING VESSELS.

ART. 26. Sailing-vessels under way shall keep out of the way of sailing-vessels or boats fishing with nets, or lines, or trawls. This rule shall not give to any vessel or boat engaged in fishing the right of obstructing a fair-way used by vessels other than fishing-vessels or boats.

GENERAL PRUDENTIAL RULE.

ART. 27. In obeying and construing these rules, due regard shall be had to all dangers of navigation and collision, and to any special circumstances which may render a departure from the above rules necessary in order to avoid immediate danger.

SOUND SIGNALS FOR VESSELS IN SIGHT OF ONE ANOTHER.

ART. 28. When vessels are in sight of one another a steam-vessel under way whose engines are going at full speed astern shall indicate that fact by three short blasts on the whistle.

PRECAUTION.

ART. 29. Nothing in these rules shall exonerate any vessel, or the owner or master or crew thereof, from the consequences of any neglect to carry lights or signals, or of any neglect to keep a proper lookout, or of the neglect of any precaution which may be required by the ordinary practice of seamen, or by the special circumstances of the case.

ART. 30. [See page 182.]

DISTRESS SIGNALS.

ART. 31. When a vessel is in distress and requires assistance from other vessels or from the shore, the following shall be the signals to be used or displayed by her, either together or separately, namely:

In the daytime—

A continuous sounding with any fog-signal apparatus, or firing a gun.

At night—

First. Flames on the vessel, as from a burning tar barrel, oil barrel, and so forth.

Second. A continuous sounding with any fog-signal apparatus, or firing a gun.

ADDITIONAL RULES.

SEC. 2. That the supervising inspectors of steam-vessels and the Supervising Inspector-General shall establish such rules to be observed by steam-vessels in passing each other and as to the lights to be carried by ferry-boats and by barges and canal-boats when in tow of steam-vessels, not inconsistent with the provisions of this Act, as they from time to time may deem necessary for safety, which rules when approved by the Secretary of the Treasury, are hereby declared special rules duly made by local authority, as provided for in article thirty of chapter eight hundred and two of the laws of eighteen hundred and ninety. Two printed copies of such rules shall be furnished to such ferry-boats and steam-vessels, which rules shall be kept posted up in conspicuous places in such vessels.

PENALTY.

SEC. 3. That every pilot, engineer, mate, or master of any steam-vessel, and every master or mate of any barge or canal-boal, who neglects or refuses to observe the provisions of this Act, or the regulations established in pursuance of the preceding section, shall be liable to a penalty of fifty dollars, and for all damages sustained by any passenger in his person or baggage by such neglect or refusal: *Provided*, That nothing herein shall relieve any vessel, owner, or corporation from any liability incurred by reason of such neglect or refusal.

SEC. 4. That every vessel that shall be navigated without complying with the provisions of this Act shall be liable to a penalty of two hundred dollars, one-half to go to the informer, for which sum the vessel so navigated shall be liable, and may be seized and proceeded against by action in any district court of the United States having jurisdiction of the offense.

EXTRACTS FROM TREASURY DEPARTMENT CIRCULAR No. 107 OF 1900.

INLAND WATERS ON THE ATLANTIC COAST OF THE UNITED STATES WHERE THE INLAND RULES OF THE ROAD ARE TO BE FOLLOWED; * * *

Pursuant to section 2 of the act approved February 19, 1895, the following lines dividing the high seas from rivers, harbors, and inland waters are hereby designated and defined:

(*Bearings are Magnetic and Given Approximately.*)

* * * * * * *

BALTIMORE HARBOR AND CHESAPEAKE BAY.—From Cape Henry Light-House NE. by E. $\frac{3}{4}$ E., easterly, to Outer Entrance Whistling Buoy, thence N. by E. $\frac{3}{8}$ E. to Cape Charles Light-Louse.

CHARLESTON HARBOR.—From Charleston Light-Vessel NE. $\frac{5}{8}$ E., to Rattlesnake Shoal West Buoy; thence W. $\frac{1}{2}$ N. to the west end of the north jetty; and from Charleston Light-Vessel about SW. $\frac{1}{8}$ W. through Charleston Whistling Buoy (proposed position) until Charleston Light-House bears NNW. $\frac{1}{2}$ W.; thence W. to Folly Island.

SAVANNAH HARBOR AND CALIBOGUE SOUND.—From Tybee Whistling Buoy NNW. $\frac{15}{16}$ W. through North Slue Channel Outer Buoy to Braddock Point, Hilton Head Island, and from Tybee Whistling Buoy W. to Tybee Island.

ST. SIMON SOUND (BRUNSWICK HARBOR) AND ST. ANDREW SOUND.—From hotel on beach of St. Simon Island $\frac{15}{16}$ mile NE. by E. $\frac{1}{4}$ E. from St. Simon Light-House, SE. $\frac{1}{8}$ E. to St. Simon Sea Buoy; thence S. $\frac{1}{4}$ E. to St. Andrew's Sound Sea Buoy; thence W. to the Shore of Little Cumberland Island.

ST. JOHN'S RIVER, FLORIDA.—A straight line from the outer end of the northerly jetty to the outer end of the southerly jetty.

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