UNITED STATES
COAST AND GEODETIC SURVEY
T. C. MENDENHALL
SUPERINTENDENT

UNITED STATES COAST PILOT

ATLANTIC COAST

PARTS I–II

FROM THE ST. CROIX RIVER TO CAPE ANN

VK
981
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1st ed.
(1891)

FIRST EDITION

PRICE $1.00

WASHINGTON
GOVERNMENT PRINTING OFFICE
1891

National Oceanic and Atmospheric Administration

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UNITED STATES

COAST AND GEODETIC SURVEY OFFICE,

WASHINGTON, D. C., *January 1, 1891.*

This volume covers that part of the coast lying between the **St. Croix River** and **Cape Ann.** It has been prepared as a part of a large volume which is designed to embrace the Atlantic coast of the United States, and is now issued separately to meet the demand for a Coast Pilot covering the section of the coast herein included.

This publication is based mainly upon the work of the Coast and Geodetic Survey, including the results of special examinations and investigations by Lieut. Commander S. M. Ackley, U. S. N., Assistant Coast and Geodetic Survey, in the summer of 1890.

The text of this volume includes—

I. A tabular description of all light-houses, light-vessels, and fog-signals; lists of life-saving stations, signal service 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, tow-boats, depth of water, draught 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 paragraphs, printed in large type, each followed by its own subordinate remarks in smaller type.

IV. Views of important points.

V. Appendices.

This volume has been prepared, and the sailing directions verified in 1890, by Lieut. Commander S. M. Ackley, U. S. N., aided by Ensign E. A. Anderson, U. S. N., Assistants Coast and Geodetic Survey, and Mr. John Ross.

The views which were originally drawn by the late Mr. John R. Barker, have been corrected to 1890.

Great courtesy has been shown by local authorities in furnishing information desired for incorporation in this work.

The aids to navigation are corrected to March 1, 1890.

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 may think, for the good of mariners, should be inserted.

T. C. Mendenhall,
Superintendent.

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SYSTEM OF BUOYAGE ADOPTED IN UNITED STATES WATERS.

The following order is observed in the buoyage of 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 will be given in the printed list of buoys,* issued by the Light-House Board.

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.

Different channels in the same bay, sound, river, or harbor will be marked, as far as practicable, by different descriptions of buoys. Principal channels will be marked by nun-buoys; secondary channels, by can-buoys; and minor channels, by spar-buoys. When there is but one channel, nun-buoys, properly colored and numbered, are usually placed on the starboard side, and can-buoys on the port side of it.

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.

Notice.—The navigator should keep in mind that the buoys in the thoroughfares and passages between the islands along the coast of Maine, are numbered and colored for entering from the eastward.

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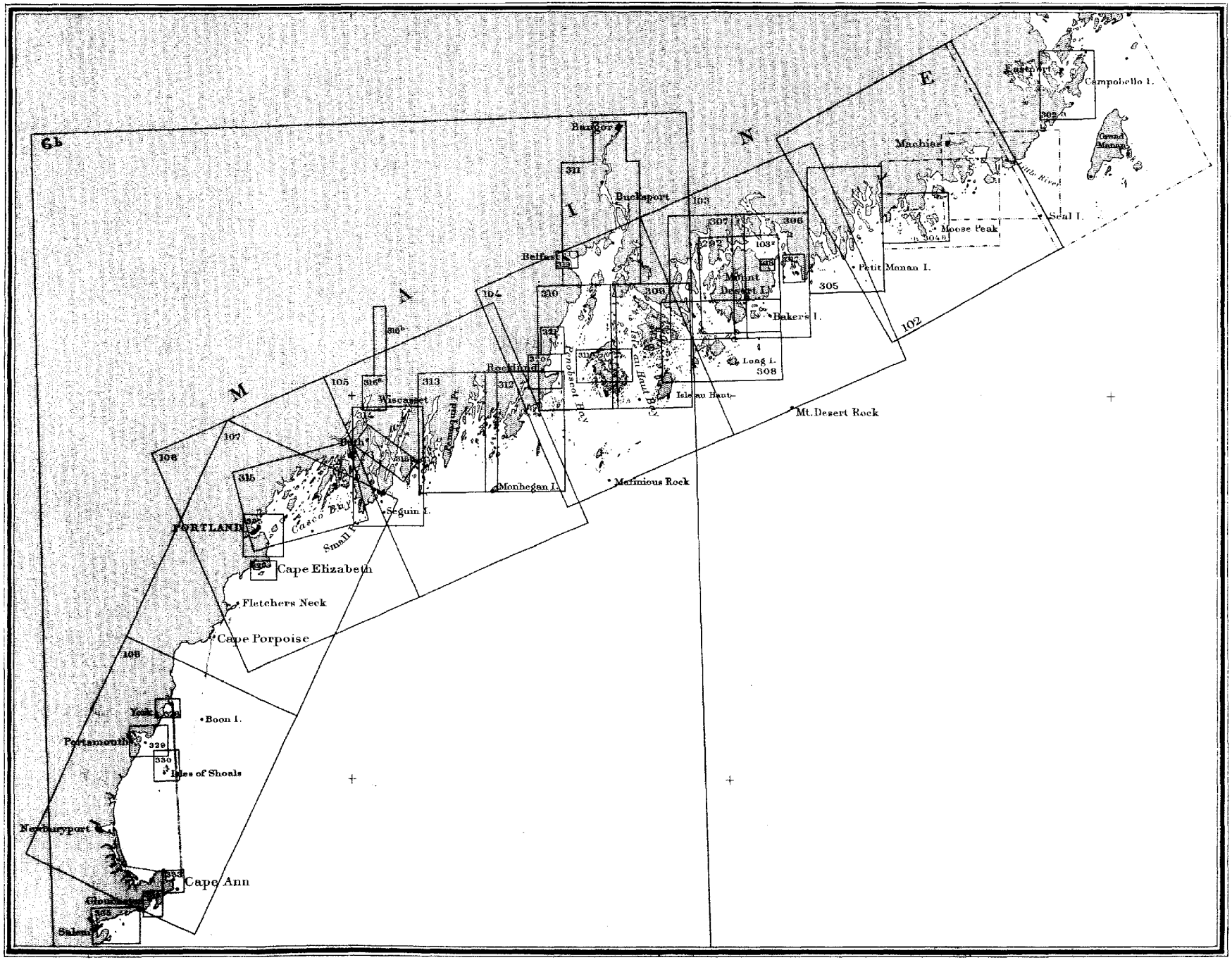
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Rockland
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Seguin I.
Monhegan I.
Penobscot Bay
Isle au Haut Bay
Isle au Haut
Mount Desert I.
Bakers I.
Long I.
Mt. Desert Rock
Mililimous Rock
Machias
Petit Manan I.
Moose Peak
Seal I.
Eastport
Campobello I.
Grand Manan
PORTLAND
Casco Bay
Small R.
Cape Elizabeth
Fletchers Neck
Cape Porpoise
Boon I.
York
Portsmouth
Isles of Shoals
Newburyport
Cape Ann
Gloucester
Salem
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GENERAL OUTLINE OF ARRANGEMENT.

This volume includes Parts 1 and 2 of the United States Coast Pilot, each part being arranged on the same general plan. The order in which this part of the coast has been treated is:—

PART I.

1. The Gulf of Maine as a whole; tables of light-houses, tide-stations, signal-service and life-saving stations, bearings and distances, and the variation of the compass.
2. General remarks on approaching the coast from seaward and sailing directions off-shore and in-shore from Quoddy Head to Cape Ann.
3. The estuaries and ports from the St. Croix River to Whitehead, with sailing directions, in detail.

PART II.

1. General description of the coast from Whitehead to Cape Ann; table of light-houses, tide-stations, signal-service and life-saving stations, bearings and distances, and variation of the compass.
2. The estuaries and ports from Whitehead to Cape Ann, with sailing directions in detail.

The sketches are introduced near the text they illustrate.

The appendices and index for both parts are at the end of the volume.

The descriptive matter and general information is in small type and precedes in every case the sailing directions.

Sailing directions, in large type, are numbered in sections in the order they would be required in practice, and when given for more than one approach or channel a letter is added to the numeral, thus: "Sailing directions, Machias Bay. Sec. 1. Approaching and entering. From the eastward." "Sec. 1A. Approaching and entering. From the westward." Section 2.

Each section contains also remarks, in fine type, relating to the principal objects that will be seen, and other information that may be of assistance to the navigator in locating his position; also a short description of the dangers and aids marking them, that will be found while following the sailing directions.

In some localities where frequent changes of course are necessary the directions are, on that account, made more general, and include the remarks, the whole being in large type.

The directions, in sections, along shore, through the inside passages, and entering the harbors are all numbered from the eastward.

Unless otherwise stated in the text, the directions in Section 2 should be followed immediately after Sections 1, 1A, or 1B.

NOTE.

All **bearings** and **courses** are *magnetic*.

All **distances** are in *nautical miles*.

Except where otherwise stated, all **depths** are at *mean low water*.

All **can** or **nun-buoys** marked thus * in this volume are replaced during the winter months by **spar-buoys**.

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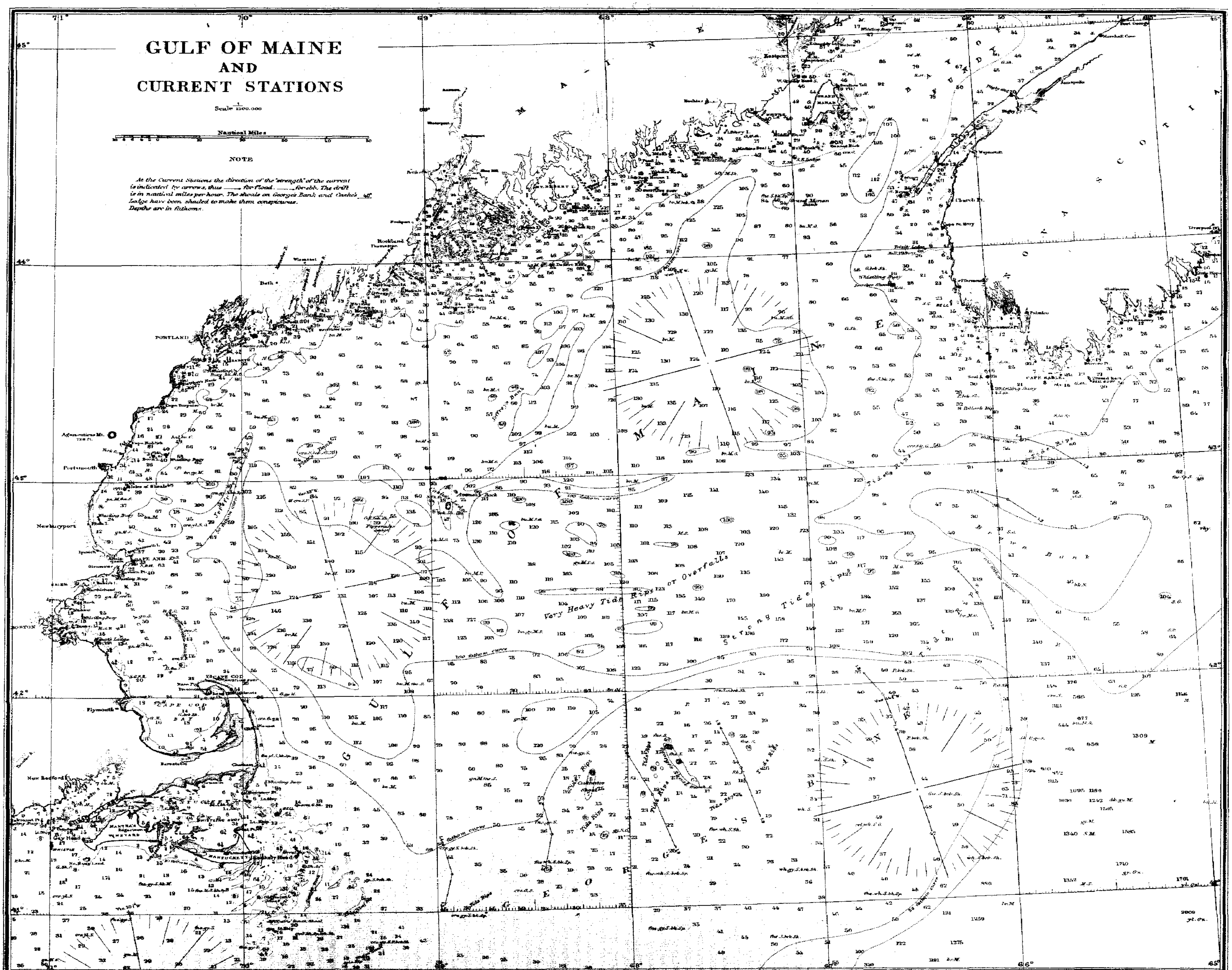
GULF OF MAINE
AND
CURRENT STATIONS
Scale 1/1500.000
Nautical Miles
NOTE
At the Current Stations the direction of the "strength" of the current is indicated by arrows, thus ——— for flood. ——— for ebb. The drift is in nautical miles per hour. The shoals on George's Bank and Cashe's Ledge have been shaded to make them conspicuous.
Depths are in fathoms.
PORTLAND
Portsmouth
Newburyport
BOSTON
Plymouth
New Bedford
Rockland
Bath
Eastport
GULF OF MAINE
BAY OF FUNDY
NOVA SCOTIA
GEORGES BANK
BROWN BANK
Very Heavy Tide Rips or Overfalls
Strong Tide Rips
CAPE COD
CAPE COD BAY
CAPE ANN
NANTUCKET
MARTHA'S VINEYARD
CAPE SABLE
GRAND MANAN

ERRATA.

Pages 16 and 44. *Moose-a-bee Reach.*—A fixed red light is shown from an iron spindle recently erected on the north side of the channel about ¼ mile to the westward of Kelley's Point.

Page 16. *Fox Islands Thoroughfare.*—A fog-bell has been established at Goose Rocks light-house. During thick weather it is struck a single blow, alternating with a double blow at intervals of 20 seconds.

Page 44. *Pulpit Rock.*—Should read, A bare rocky isle.

Page 48. *Narraguagus Bay.*—The fourth line from bottom of page should read, Up to the lower steamboat wharf.

Page 49. *Narraguagus Bay.*—The last paragraph at botton of page. The word steamboat should be omitted where it precedes the word wharf in this paragraph.

Page 56. *Winter Harbor.*—The spar buoy marking Grindstone Ledge has been changed to a can buoy. A black can buoy (No. 1) has been placed 160 yards SE. by S. from Harbor Point.

Page 59. *Frenchman's Bay.*—The whistling buoy off Great Head is removed in winter and put down again in spring.

Page 64. *Foot note.*—The price of chart 103 should be $0.50 instead of $0.58.

Page 71. *Third line from top of page.*—Where the page number has been left blank — 67 should be inserted.

Page 72. *Ship and Barges Ledge.*—At end of line should read 350 yards, instead of 400.

Pages 73, 79, 80, 82, 84, 89, 92. In the foot-note on these pages, chart No. 104 should be $0.50 instead of $0.40.

Page 85. *Ayrey's Cove.*—Should be spelled Arey's.

Page 87. *Third line from top of page.*—Gull Rook should be Gull Rock.

Page 95. *Fifth line from top of page.*—Grindle's should be spelled Grindel.

Page 112. *Sheepscot River.*—A fog-bell, struck by machinery a single blow every 20 seconds, has been erected at Hendricks Head light-house.

N. B.—While this volume was in press the spelling of certain geographic names used in it was changed by the "U. S. Board on Geographic Names." Wherever it is found that the same name is spelled differently in the first and latter parts of this volume the index should be consulted as the standard.

UNITED STATES COAST PILOT.

ATLANTIC COAST—PART I.

FROM THE ST. CROIX RIVER TO WHITEHEAD.

GULF OF MAINE.†

The great indentation of the coast between the British province of Nova Scotia on the north and Massachusetts on the south, which includes the Bay of Fundy and Massachusetts Bay as subsidiary features, has recently received the general designation "Gulf of Maine."

On account of its changeable weather, frequent fogs, and strong tidal currents this locality has a bad reputation among mariners. (For off-shore current observations see Appendix I and chart facing this page.)

The bottom is so irregular and the depths so variable that it is quite impossible to determine a vessel's position by soundings alone, but the navigator will find a frequent use of the lead of the greatest assistance in approaching both George's and Brown's banks from the southward and eastward, the bottom slope on that side being very well defined.

The principal off-shore dangers are Nantucket Shoals; George's and Cultivator shoals, both a part of George's Bank; Sigsbee's Rock, a part of Cashe's Ledge, and Ammen's Rock.

Brown's Bank, with 30 to 50 fathoms of water over it, is about 40 miles south of Cape Sable, between latitude 42° 17′ and 42° 54′ N. and longitude 65° 12′ and 66° 28′ W. The bank is about 50 miles long in a W NW. and E SE. direction, and its greatest width is nearly 30 miles.

George's Bank is the extensive shoal ground (depth less than 50 fathoms) lying off the coast of Massachusetts to the eastward of Nantucket Shoals. The northeastern point of this bank is in latitude 42° 05′ N. and longitude 66° 02′ W.; from this the eastern edge trends in a general SW. by S. direction to latitude 40° 53′ N. and longitude 66° 40′ W.; the edge of the bank then takes a general W. direction to longitude 69° 00′ W., where it joins the 50-fathom curve which makes off shore. The greatest width N. and S. is about 80 miles. That part of the bank where depths of less than 20 fathoms will be found, including George's and Cultivator shoals, lies between latitude 41° 06′ and 41° 58′ N. and longitude 67° 17′ and 68° 30′ W.; between these limits it is about 75 miles long in a NE. and SW. direction, and has several spots with 5 to 10 fathoms of water over them.

George's Shoal is a dangerous shoal between latitude 41° 33′ and 41° 47′ N. and longitude 67° 37′ and 67° 53′ W. The shoalest water within these limits is 14 feet; in heavy weather the sea breaks here in 10 fathoms, and heavy tide rips are found over the shoalest water. The northern end bears SE. ¾ E., distant 135 miles from Cape Ann light-houses.

Cultivator Shoal is about 8 miles long in a N NE. and S SW. direction, with a depth of 3 to 8 fathoms. It lies between latitude 49° 30′ and 49° 39′ N. and longitude 68° 10′ and 68° 14′ W., and is about 19 miles to the westward of the shoalest part of George's Shoal. The northern end of this shoal bears SE. by E. ½ E., distant 89 miles from Cape Cod (Highlands) light-house.

A detached shoal, with 5¼ fathoms over it, lies in latitude 41° 11′ N., longitude 68° 25′ 30″ W. Between this and Cultivator Shoal are several shoal spots with 8 and 10 fathoms over them.

Nantucket Shoals is the general name of the numerous different shoals which lie to the southeastward of Nantucket Island and make this one of the most dangerous parts of the coast of the United States for the navigator. These shoals are shifting in their nature, and the depths vary from 7 feet on some to 4 and 5 fathoms on others, while slues with depths of 10 fathoms or more lead between those farthest off shore. The southeasternmost of these shoals (*Phelp's Bank*) has a least depth of 10 fathoms. *Asia Rip*, a part of this bank, lies 40 miles SSE. ¾ E. from Sankaty Head light-house and 22 miles SE. by E. ¼ E. from Davis New South Shoal light-vessel, in

† Shown on Coast and Geodetic Survey chart A, scale $\frac{1}{1,200,000}$, price $1.00

latitude 40° 47′ 30″ N., longitude 69° 23′ W. *Fishing Rip*, with a depth of 4½ to 6½ fathoms over it, is about 11 miles long in a NE. and SW. direction; the middle of the rip lies 29 miles SE. ¼ E. from Sankaty Head light-house and 19 miles E. ⅜ N. from Nantucket New South Shoal light-vessel. The depth between Fishing Rip and Asia Rip is 10 to 26 fathoms. *Davis South Shoal* is the southwestern part of Nantucket Shoals; it has a least depth of 8 feet, and there is a light-vessel placed to the southward of it. Soundings of 4½ to 10 fathoms will be found for a distance of 8 miles to the southwestward of the light-vessel. The shoals and rips lying to the northward of Davis South Shoal and to the northwestward of Fishing Rip have depths ranging from 8 feet to 5½ fathoms over them. The tidal currents are strong, and variable in direction, forming extensive rips and broken water over the shoals.

Cashe's Ledge lies 74 miles E. from Cape Ann light-houses, and the part over which the depth is less than 30 fathoms is about 6½ miles long in a N NE. and S SW. direction. *Sigsbee's Rock*, with a depth of 5 fathoms over it, is near the middle of the ledge in latitude 42° 53′ 30″ N., longitude 69° 54′ 10″ W. *Ammen's Rock*, with a depth of 4¼ fathoms over it, lies 4 miles NE. ½ E. from Sigsbee's Rock. The sea breaks over these rocks in heavy weather.

Jeffrey's Bank has a least depth of 46 fathoms.

Platt's Bank has a least depth of 39 fathoms.

Jeffrey's Ledge makes to the northeastward from Cape Ann, and has a least depth of 20 fathoms over it. The northeastern point of the ledge is 22 miles E. ½ S. from Boon Island light-house.

Stellwagen Bank lies to the northward of Cape Cod and off the entrance to Massachusetts Bay; the depth over it is from 9½ to 20 fathoms.

BAY OF FUNDY.†

This is a large arm making to the northeastward from the Gulf of Maine between Nova Scotia and New Brunswick; the entrance, between Bryer Island, Nova Scotia, and Libby Island, Maine, is about 46 miles wide. Grand Manan Island and its outlying islands and ledges divide the entrance into two passages, the one to the westward of the island, between it and the coast of Maine, being known as *Grand Manan Channel.*

The Bay of Fundy has deep water, and the shores are comparatively bold. The tidal currents run with great velocity. At the head of the bay the rise of tide is from 40 to 50 feet, the flood coming in generally in a "bore" or tidal wave. The frequent changes of weather, the set of the current, and the thick, long continued fogs make the navigation of the bay hazardous even to the most experienced navigator.

GRAND MANAN CHANNEL.‡

This channel leads along the coast of Maine between it and Grand Manan Island, and is an approach, from the westward, to Quoddy Roads and Passamaquoddy Bay, and the most direct passage for vessels bound up the Bay of Fundy from along the coast of Maine. The channel varies in width from 5½ miles abreast Campobello Island to 10 miles abreast Southwest Head, the southwestern point of Grand Manan Island. Its western approach is marked by Machias Seal Island lights, which also mark the westernmost of the rocks and ledges which lie to the southwestward of Grand Manan Island. With the exception of the dangers between Machias Seal Islands and Grand Manan Island the channel is free and has a good depth of water. The tidal currents have a velocity of 2½ to 3 knots and follow the general direction of the channel. Off West Quoddy Head the currents set in and out of the roads forming strong rips. Vessels should not approach West Quoddy Head too closely with a light wind.

COAST OF MAINE FROM THE ST. CROIX RIVER TO WHITEHEAD.§

This stretch of coast, 108 miles long in a straight line from West Quoddy Head to Whitehead, is generally rocky and indented by numerous large bays and many excellent harbors. Numerous islands lie along the shore, between which there are passages that are much used by vessels of less than 12 feet draught, as they afford anchorage in a head wind, or thick weather. The many sunken rocks and ledges which lie along and off this coast require the closest attention of the navigator, as in many cases they rise abruptly from deep water and the lead does not always give indications of their proximity until too late to avoid them. The navigator should also remember that the average rise of spring tide at Rockland is 10.3 feet, at Millbridge 12.1 feet, and at Eastport 19.4 feet, and that a vessel may sometimes pass over places at high water on which she would bring up at low water.

The most important harbors and anchorages are: Calais, St. Croix River; Eastport, Friar Roads; Cutler, Little River; Machiasport, Machias Bay; Millbridge, Narraguagus Bay; Winter Harbor, Bar Harbor, and Stave Island Harbor, all in Frenchman's Bay; Southwest Harbor; Bass Harbor; Castine, Belfast, Camden, Rockport, and Rockland in Penobscot Bay, and Bangor and Bucksport in Penobscot River. There are many other harbors and anchorages which are treated under the different headings.

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† See foot note on page 11.

‡ Shown on Coast and Geodetic Survey charts: **A**, scale $\frac{1}{1,200,000}$, price $1.00; and **101a**, scale $\frac{1}{80,000}$, price $0.50.

§ Shown on Coast and Geodetic Survey charts: **A**, scale $\frac{1}{1,200,000}$, price $1.00; **101a, 102, 103**, and **104**, scale of each $\frac{1}{80,000}$, price of each $0.50. See also index map following page VIII.

Prominent Features.—The shore-line between West Quoddy Head and Little River presents no special features; to the westward of Little River the shore is broken by bays and islands, and continues to be so to Whitehead. *Grand Manan Island* has nearly perpendicular, dark, rocky faces about 200 feet high on its western side. *Pigeon Hill*, on the western side of Pigeon Hill Bay, near the head, is 307 feet high. *Schoodic Mountain*, near the south end of Schoodic Peninsula, the eastern point at entrance to Frenchman's Bay, is 437 feet high. *Green Mountain*, the highest on Mt. Desert Island, is 1,532 feet high and the most prominent landmark on this part of the coast. *Isle au Haut* is 556 feet high near its northern end, and is on the eastern side of the entrance to East Penobscot Bay. The *Camden Hills* (Mount Megunticook, 1,320 feet) are on the western side of Penobscot Bay, above the town of Camden.

Aids to Navigation.—At night, in clear weather, no difficulty should be experienced in standing along the coast, as the lights are numerous and readily distinguished (see table of lights, pages 16–19). Many of the most importan outlying dangers are marked by buoys or spindles. The buoyage accords with the system adopted for U. S. waters (see page V). In the thoroughfares the aids are numbered and colored for entering from the eastward.

Pilots.—Most of the piloting into the harbors and through the thoroughfares on this part of the coast is done by local fishermen. Pilotage is not compulsory (see extracts from Revised Statutes of Maine, Appendix II). Little River, Maine, is a rendezvous for the St. John's, New Brunswick, pilots, who are frequently employed by vessels passing there and bound to the eastward, to ports in Maine and the British provinces. Pilots from the British provinces can take vessels into Maine ports, but Maine pilots are not permitted to take vessels into ports in the provinces, as there, pilotage is compulsory. See, also, "Pilots," under the different headings.

Tow-boats are to be had in the St. Croix River, in Machias River, and in Penobscot River. See also "Tow-boats," under headings Narraguagus Bay and Rockland Harbor.

Quarantine.—The quarantine laws of Maine govern the ports of the State; local municipal officers have the power to make quarantine regulations for the ports under their control. See Appendix II.

Harbor Control.—See Appendix II.

U. S. Marine Hospital Service.—The relief stations of the U. S. Marine Hospital Service are at Bangor, Belfast, Ellsworth, Machias, and Rockland, at each of which places an Acting Assistant Surgeon of the service is stationed. At Eastport relief is furnished under the provisions of the regulations for third-class stations. See Appendix IV.

Supplies.—Coal can be obtained at Eastport, Rockland, and Bangor; a limited supply may be found at Belfast and Bar Harbor. Water, provisions, and ship-chandler's stores can be obtained at the above places and at many other towns. See "Supplies," under the different headings.

Repairs.—There are a number of marine railways, but Bangor and Rockland are the only places at which repairs to the machinery of steamers can be made, and at the latter place only in a small way. See "Repairs," under the several headings.

Ice.—The extent to which the harbors of Maine are closed to navigation by ice varies greatly in different years. During some winters most of the harbors are open, while in others the only harbors available for anchorages are Quoddy Roads, Eastport, Little River, Machias Bay (above Avery's Rock Light), Mistake Harbor (not much used), Winter Harbor, and Boothbay Harbor. Portland Harbor generally has an open channel in winter, kept so by steamers and tugs. The mouths of the rivers are generally avoided for anchorage in winter and early spring, on account of running ice. In the bays and harbors the ice formation is mostly local; beginning at the head, in sheltered places along the shore, it extends outward. During a calm or light winds from the northward, the local formations rapidly increase, while strong winds break them up and force them as drift ice on to the lee shore. The tidal currents do not prevent the formation of ice, or influence its movement in strong winds, except in the larger rivers. See also "Ice," under the different headings.

Fogs are the dread of the navigator on this coast in summer; they are liable to set in at any time, often with almost no warning. They are of frequent occurence during June, July, and August; some portion of this period invariably has much thick weather, while other portions may be free from it. Fogs have been known to last three weeks, almost without intermission. At the heads of the bays and within the rivers it is often comparatively clear when thick outside; the fog of such interior waters usually "scales up" (clears) throughout the middle of the day. Winds from the east to southwest, by the way of south, are those which bring in fog; westerly and northerly winds clear it away.

Under this heading scarcely any rule can be made that is not subject to frequent exceptions, and those who have the most experience in the matter are the least apt to make predictions. It is usually the case, however, that a fall of the barometer below 30.00 inches during a fog will be followed by the lifting of the fog. If a wisp of mist is to be seen hanging over Mount Desert or over the Camden Hills, whether otherwise clear or not, the following day is usually foggy. When calm during the ebb tide, if the fog is seen in a bank off shore, provided it remains calm, the fog will come in with the following flood.

Tidal Currents.—The tidal currents on the Coast of Maine and in the bays and rivers are very strong; they must always be considered and allowed for. In thick weather or light winds vessels are sometimes set ashore by them.

Alongshore, the flood sets to the eastward and is stronger than the ebb, which sets to the westward. In passing

from one headland to another it is always necessary to make allowance for the current setting into or out of the bays or rivers, according to the stage of the tide; such allowance frequently amounts to as much as ½ point.

In the Bay of Fundy the currents are particularly strong. To the eastward of Mount Desert the currents are stronger than farther west, but are more regular in their ebb and flow, conforming more exactly to the rise and fall of the tides. Along the coast between Mount Desert and Portland the effect of the westerly (ebb) set is more marked as compared with the flood than is the case farther east.

With easterly or southeasterly winds the currents have more of a tendency on shore than at other times, but they are not affected much by northerly, westerly, or southerly winds.

No systematic current observations have been made along the Coast of Maine. For off-shore current data see Appendix I.

Winds.—The prevailing winds during the summer are southwesterly, and during the winter, northerly. At all seasons the heaviest gales are generally northeasterly or easterly.

Freshets.—In all the rivers freshets sometimes occur in the spring, or in the fall after very heavy rains. In the larger rivers they are sometimes dangerous to navigation when accompanied with running ice.

BEARINGS AND DISTANCES.†

West Quoddy Head Light-house.—The following are bearings and distances from West Quoddy Head Light-house:

	Miles.
SW. Wolf Island Light-house, N. B., E NE. ¼ E	12
Leprean Light-house, N. B., E NE. ½ E	25½
Musquash Light-house, N. B., E NE. ⅝ E	36
Cape Spencer Light-house, N. B., E. ¾ N	50
North Point of Grand Manan Island, N. B., SE. by E. ⅝ E	7
Southwest Head Light-house, Grand Manan Island, S. by W	13
Machias Seal Island Light-houses, N. B., SW. ½ S	19¾
Mount Desert (Rock) Light-house, SW. by W. ½ W	72

Libby Island Light-house.—The following are bearings and distances from Libby Island Light-house:

	Miles.
Southwest Head Light-house, Grand Manan Island, N. B., E SE. ⅞ E	19¾
Machias Seal Island Light-houses, N. B., SE. ¾ E	12
Seal Island Light-house, N. S., S SE	92
Moose Peak Light-house, W SW. ⅓ W	9
Mount Desert (Rock) Light-house, SW. by W. ¼ W	49

Petit Manan Light-house.—The following are bearings and distances from Petit Manan Light-house:

	Miles.
Narraguagus Light-house, N NE. ⅞ E	5½
Nash Island Light-house, NE. by E. ⅓ E	7¾
Machias Seal Island Light-houses, N. B., E. ¼ S	34
Mount Desert (Rock) Light-house, SW. ¼ S	26½
Matinicus Rock Light-houses, W SW. Southerly	55
Baker's Island Light-house, W. by S	16⅛
Schoodic Island, whistling buoy, W. ½ S	7⅜

Mount Desert (Rock) Light-house.—The following are bearings and distances from Mount Desert (Rock) Light-house:

	Miles.
Baker's Island Light-house, N. ½ E	16⅝
Egg Rock Light-house, N. by E. ⅝ E	23
Winter Harbor Light-house, N. by E. ⅞ E	23½
Moose Peak Light-house, NE. by E. ⅓ E	40
Machias Seal Island Light-houses, N. B., E NE. ¼ E	54½
Seal Island Light-house, N. S., SE. ⅝ E	98
Matinicus Rock Light-houses, W. ¼ S	33¼
Spindle on Roaring Bull, W NW. ¼ W	21¾
Long Island Head, N NW. ¾ W	12
Great Duck Island Light-house, N. ⅞ W	11½

† Lights marked N. B. are in the Province of New Brunswick; those marked N. S. are in the Province of Nova Scotia.

BEARINGS AND DISTANCES—Continued.

Matinicus Rock Light-houses.—The following are bearings and distances from Matinicus Rock Light-houses:

	Miles.
Machias Seal Island Light-houses, N. B., E NE. ¾ E	88
Seal Island Light-house, N. S., SE. by E. ½ E	126
Cape Cod (Highlands) Light-house, SW. ¼ S	117½
Cape Ann Light-houses, SW. by W. ½ W	102
Boon Island Light-house, W SW. ¾ W	81
Cape Elizabeth Light-houses, W. ½ N	60
Halfway Rock Light-house, W. ⅝ N	52
Seguin Light-house, W. ¾ N	39½
Monhegan Light-house, W. by N	20

TIDES—CALAIS, ME., TO WHITEHEAD, ME. †

GENERAL TABLE.

LOCALITY.	CORRECTED ESTABLISHMENT.	CORRECTION FOR STANDARD TIME.	MEAN RISE AND FALL.			MEAN DURATION OF			RISE OF HIGHEST TIDE OBSERVED.
			Mean tides.	Spring tides.	Neap tides.	Rise.	Fall.	Stand.	
	h. m.	m.	Feet.	Feet.	Feet.	h. m.	h. m.	h. m.	Feet.
Calais	11 36	—31	20.3	22.9	17.7	5 56	6 29	.....	23.7
Eastport	11 08	—32	18.2	20.6	15.8	6 01	6 24	.....	22.2
Quoddy Roads	10 55	—32	15.2	17.3	13.1	6 03	6 22	.....	18.0
Little River	10 43	—31	14.1	16.1	12.1	6 05	6 20	.....	16.7
Machiasport	11 02	—30	13.5	15.5	11.5	6 03	6 22	.....	16.0
Englishman Bay	10 49	—30	12.3	14.1	10.5	6 04	6 21	.....	15.1
Jonesport	10 58	—30	11.7	13.1	10.3	6 09	6 16	.....	13.9
Moose Peak Light	10 33	—30	12.0	13.8	10.2	6 09	6 16	.....	14.8
Nash Island Light	10 40	—29	11.0	12.7	9.3	6 10	6 15	.....	13.6
Narraguagus Bay	10 43	—29	11.2	12.9	9.5	6 20	6 05	.....	13.9
Pigeon Hill Bay	10 44	—29	11.2	12.9	9.5	6 10	6 15	.....	13.7
Dyer's Bay	10 48	—28	10.9	12.5	9.3	6 10	6 15	.....	13.6
Gouldsborough Bay	10 56	—28	11.0	12.7	9.3	6 10	6 15	.....	13.5
Prospect Harbor	10 50	—28	10.8	12.4	9.2	6 11	6 14	.....	13.2
Winter Harbor	10 52	—28	10.8	12.4	9.2	6 11	6 14	.....	12.9
Flander's Bay, West Gouldsborough	11 03	—28	11.0	11.6	9.4	6 10	6 15	.....	13.8
Bar Harbor	10 54	—27	11.1	12.8	9.4	6 11	7 14	.....	13.7
Sullivan Harbor	11 09	—27	11.5	13.2	9.8	6 10	6 15	.....	13.9
Salisbury Cove	11 01	—27	11.3	13.0	9.6	6 11	6 14	.....	14.1
Mount Desert Narrows	11 10	—27	11.5	13.2	9.8	6 10	6 15	.....	14.2
Somes Sound	11 04	—27	10.0	11.5	8.5	6 11	6 14	.....	12.5
Southwest Harbor	10 54	—27	10.1	11.6	8.6	6 11	6 14	.....	12.8
Bass Harbor	10 53	—27	10.0	11.5	8.5	6 11	6 14	.....	12.5
Blue Hill Harbor	11 07	—26	10.9	12.5	9.3	6 10	6 15	.....	12.9
Union River	11 11	—26	11.5	13.2	9.8	6 10	6 15	.....	14.0
Burnt Coat Harbor	11 05	—26	10.0	11.5	8.5	6 12	6 13	.....	12.5
Eggemoggin Reach, Sedgwick	11 18	—26	9.9	11.4	8.4	6 14	6 11	.....	13.3
Deer Island Thoro., Green's Landing	10 59	—25	9.6	11.0	8.2	6 14	6 11	.....	11.6
Carver's Harbor	10 55	—25	9.3	10.7	7.9	6 14	6 11	.....	11.6
Fox Islands Thoro., Iron Point	11 08	—25	10.0	11.5	8.5	6 14	6 11	.....	11.8
Muscle Ridge Channel	11 05	—24	9.4	10.8	8.0	6 14	6 11	.....	11.7
Rockland Harbor	11 09	—24	9.6	11.0	8.2	6 14	6 11	.....	11.9
Camden Harbor	11 13	—24	9.7	11.2	8.2	6 14	6 11	.....	12.2
Castine Harbor	11 25	—25	9.8	11.3	8.3	6 13	6 12	.....	11.8
Belfast Harbor	11 35	—24	10.2	11.7	8.7	6 13	6 12	.....	11.8
Fort Point, Penobscot River	11 34	—25	10.1	11.6	8.6	6 13	6 12	.....	12.0
Bucksport	11 50	—25	10.6	12.2	9.0	6 12	6 13	.....	12.8
Winterport	12 10	—25	11.3	13.0	9.6	6 09	6 16	.....	13.6
Hampden	12 30	—25	12.0	13.8	10.2	6 06	6 19	.....	15.2
Bangor	12 48	—25	13.1	15.1	11.1	6 01	6 24	.....	15.5

† Tide Tables for the Atlantic Coast, published annually by the U. S. 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 on pages VII, VIII; price $0.25.

LIGHT-HOUSE DISTRICT, ETC.

The coast and waters covered by Part I of this volume lie within the **First Light-house District** of the United States. The Light-list for the sea-coast, of the United States and the Buoy-list of the First District give full descriptions of the aids to navigation. These pamphlets, which are corrected and reprinted from time to time, are sent free of charge to any shipmaster on application to the Light-house Board, Washington, D. C., or to the Inspector of the District, Custom House, Portland, Me.

TABLE OF LIGHTS.

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	St. Croix River	45 07 44 67 08 03	Fixed white, varied by a white flash every 30 sec.	5	71	12
2	Lubec Channel	44 50 (22) 66 58 (31)	Flashing white every 15 sec.	5	61	13½
3	West Quoddy Head	44 48 55 66 57 04	Fixed white	3	133	18
4	Little River	44 39 03 67 11 34	Fixed white, varied by a white flash every 90 sec.	5	40	11
5	Avery's Rock	44 39 16 67 20 41	Fixed red	5	68	8½
6	Libby Island	44 34 06 67 22 04	Fixed white	4	52	12
7	Moose Peak	44 28 23 67 31 57	Flashing white, every 30 sec	2	72	14
8	Nash's Island	44 27 52 67 44 52	Fixed red	4	47	11½
9	Narraguagus	44 27 21 67 49 54	Fixed white	5	45	12
10	PETIT MANAN	44 22 03 67 51 51	Fixed white, varied by a white flash every 2 minutes.	2	125	17
11	Prospect Harbor	44 24 12 68 00 48	Flashing alternately red and white; interval between flashes, 30 sec.	5	45	11
12	Winter Harbor	44 21 41 68 05 18	Fixed white	5	37	11
13	MOUNT DESERT	43 58 08 68 07 44	Fixed white	3	75	14
14	Egg Rock	44 21 (15) 68 08 (19)	Fixed red	5	76	8½
15	Crabtree's Ledge	44 28 20 68 13 18	Fixed white, varied by a white flash every 2 minutes.	5	54	12½
16	Baker's Island	44 14 29 68 11 58	Fixed white, varied by a white flash every 90 sec.	4	105	15
17	Great Duck Island	44 08 (32) 68 14 (49)	Flashing red, every 10 sec	5	71	14
18	Bear Island	44 17 (00) 68 16 (14)	Fixed white	5	95	12¾
19	Bass Harbor Head	44 13 19 68 20 16	Fixed red	5	56	8½
20	Burnt Coat Harbor	44 08 03 68 26 52	Fixed white	4	75	14
21	Blue Hill Bay	44 14 55 68 29 54	Fixed white	5	26	9
22	East Penobscot Bay. Saddleback Ledge	44 00 52 68 43 37	Fixed white	5	51	12
23	East Penobscot Bay. Heron Neck	44 01 31 68 51 45	Fixed red	5	92	8½
24	East Penobscot Bay. Deer Island Thoroughfare	44 08 04 68 42 14	Fixed white	4	52	12
25	East Penobscot Bay. Goose Rocks	44 08 (08) 68 49 (52)	Fixed red, with a fixed white sector between NW. ¾ W. and NW. ¾ N.	5	56	13
26	East Penobscot Bay. Eagle Island	44 13 04 68 46 06	Fixed white	4	106	16
27	East Penobscot Bay. Pumpkin Island	44 18 33 68 44 36	Fixed white	5	27	9
28	Matinicus Rock	43 47 (03) 68 51 (21)	Fixed white	3	85	15
29		43 47 01 68 51 20	Fixed white	3	90	15½
30	Whitehead	43 58 43 69 07 30	Fixed white	3	79	14

ST. CROIX RIVER TO WHITEHEAD.

Number.	Color and peculiarity of light-house or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
1	Lantern on white dwelling	31	Bell struck by hand in answer to signals.
2	Black cylindrical foundation and brown conical tower, surmounted by a black lantern.		Bell struck by machinery every 10 sec.
3	Tower, painted with red and white horizontal stripes, and connected with a white dwelling by a work-room. A white brick fog-signal house 80 feet SW. from the tower.	55	10-inch steam whistle; blasts 8 sec., intervals 52 sec. A bell rung by hand is in reserve.
4	Brown tower, detached from white frame dwelling. White pyramidal bell-tower, about 200 feet S SE.	28	Bell struck by machinery every 30 sec.
5	Square white tower, rising from middle of square white dwelling. Bell-tower and boat-house near by.	36	Bell struck by machinery every 11 sec.
6	Gray granite tower, detached from white dwelling. Brick fog-signal house on S. point of island.	35	3d-class Daboll trumpet; blasts 7 sec., intervals 40 sec. If Daboll trumpet be disabled, a bell will be struck by hand.
7	White tower with brick annex and a covered way extending nearly to a white dwelling.	40	Hand-bell, rung in answer to signals.
8	Square white tower and dwelling connected by a porch and work-room. A pyramidal bell-tower at NW. side of tower.	28	Bell struck by machinery, a double and a single blow, alternately, with intervals of 20 sec.
9	White tower, connected with white dwelling by a work-room	29	Bell struck by hand in answer to signals.
10	Gray granite tower, with cluster of white buildings near. White fog-signal house on the S. point of the island.	100	10-inch steam-whistle, giving each minute two blasts of 5 sec., with alternate intervals of 8 and 42 sec. If whistle be disabled a bell will be rung by hand.
11	Granite tower with dwelling attached; southern end of dwelling and tower white.	30	Hand-bell, rung in answer to signals.
12	White tower and dwelling, connected by work-room and porch	19	Hand-bell, rung in answer to signals.
13	Gray granite tower. Two white dwellings near. Pyramidal skeleton bell-tower, about 275 feet S SW. of tower.	60	Bell struck by machinery every 10 sec.
14	Square white tower, rising from middle of square white dwelling. Bell-tower close to S. side of dwelling.	36	Bell struck by machinery, a double blow every 20 sec.
15	Black cylindrical foundation pier, surmounted by a brown conical tower. A gallery, with roof, surrounds base of tower.		Bell struck by machinery, a single blow every 10 sec.
16	White tower and dwelling, connected by work-room	37	
17	Cylindrical brick tower, standing near a brick fog-signal house and rain shed; three white dwellings back of the tower.	35	10-inch steam-whistle, giving blasts of 3 sec. duration, with silent intervals of 17 sec.
18	Tower with work-room annexed, both of brick, and brown frame dwelling. Pyramidal bell-tower near brow of hill, about 200 feet SE. of tower.	22	Bell struck by machinery every 15 sec.
19	White tower and dwelling, connected by porch	26	Bell struck by hand in answer to signals.
20	Two square white towers, connected by a covered way. Light exhibited from rear tower. White dwelling connected with tower.	32	Hand-bell, rung in answer to signals.
21	White tower and dwelling connected by work-room	22	Hand-bell, rung in answer to signals.
22	Gray granite tower, with white base. White frame building attached, and a pyramidal skeleton bell-tower on S. side.	36	Bell struck by machinery every 10 sec.
23	White tower, attached to the end of a white dwelling	24	Hand-bell, rung in answer to signals.
24	Square white tower, attached to a white dwelling. Fog-bell tower red	25	Bell struck by machinery, a double blow every 15 sec.
25	Black cylindrical foundation pier, surmounted by a brown conical tower and black lantern.		
26	White tower and attached dwelling	30	Hand-bell, rung in answer to signals.
27	White tower and dwelling, connected by a work-room	20	Hand-bell, rung in answer to signals.
28	Two towers, with one dwelling of granite, natural color, and two dwellings of wood, painted white. A brick fog-signal house, and a brick oil-house, SW. of and near south tower. Towers 180 feet apart, ranging N NW. and S SE	40	10-inch steam-whistle; blasts 5 sec., intervals 25 sec. If whistle be disabled, a bell will be struck by hand.
29		50	
30	Gray granite tower, connected with a white dwelling by a white porch. Brick fog-signal house about 25 feet S. of dwelling. Signal Service flag-staff to northwestward of tower.	34	10-inch steam-whistle; blasts 4 sec., intervals 26 sec. If whistle be disabled, a bell will be rung by hand.

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.
			° ′ ″				
31	Penobscot Bay.	Owl's Head	44 05 32 69 02 40	Fixed white	4	105	16
32		Rockland Breakwater	44 06 (39) 69 04 (49)	Fixed white	Lens lantern.	27	-------
33		Brown's Head	44 06 42 68 54 36	Fixed white, with two fixed red sectors; S. W. red sector between N. by E. ¼ E. and NE. by E. ¾ E.; westerly red sector between E NE. ⅞ E. and E SE. ⅛ E.	5	39	11
34		Indian Island	44 09 (55) 69 03 (23)	Fixed red	5	47	8½
35		Negro Island	44 12 05 69 02 57	Fixed white	4	52	12
36		Grindel's Point	44 16 54 68 56 36	Fixed white	5	39	11
37		Dice's Head	44 22 58 68 49 11	Fixed white	4	130	17
38		Fort Point	44 28 02 68 48 44	Fixed white	4	103	16

NOTE.—All bearings are MAGNETIC, and in case of visibility of lights given from SEAWARD.

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

1st. PRIMARY SEA-COAST LIGHTS.

2d. SECONDARY SEA-COAST LIGHTS, AND LAKE-COAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, river, and harbor lights.

The geographical positions of light-houses 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 30° 45′ (57″).

WIND-SIGNAL STATIONS—ST. CROIX RIVER TO WHITEHEAD.

The wind-signals of the U. S. Signal Service are shown for the benefit of mariners at the following points. The list of stations is corrected to January, 1891. The signals are described and their meaning is explained in Appendix III.

Eastport, Me. **Whitehead, Me.**

UNITED STATES LIFE-SAVING STATIONS—ST. CROIX RIVER TO WHITEHEAD.

The following list of life-saving stations has been corrected to March 1, 1891. These stations are furnished with life-boats, mortars, and all other appliances for affording assistance in case of shipwreck:†

NAME OF STATION.	STATE.	LOCALITY.	APPROXIMATE POSITION. Latitude, north.	Longitude, west.
			° ′ ″	° ′ ″
Quoddy Head	Me	In Carrying Place Cove, 1¼ miles W. from West Quoddy Head light.	44 48 40	66 58 50
Cross Island	Me	On eastern end of the island at entrance to Machias Bay.	44 36 45	67 16 30
Crumple Island	Me	On north side of the island, 3¼ miles W. by S. from Moose Peak light.	44 26 40	67 36 10
Cranberry Islands	Me	On SE. end of Little Cranberry Island about 1 mile N. by W. ¾ W. from Baker's Island light.	44 15 30	68 12 40
Whitehead	Me	About ⅛ mile W. from Whitehead light	43 58 40	69 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.

ST. CROIX RIVER TO WHITEHEAD—Continued.

Number.	Color and peculiarity of light-house or vessel.	Height in feet, from base of structure to center of lantern.	Fog-signal.
31	White tower, detached from a white dwelling. Fog-signal house on bluff, 100 feet NE. of light-house.	19	Bell struck by machinery every 15 sec. If machinery be disabled, a bell will be rung by hand.
32	Lantern, hung on iron crane on top of stone beacon	18	
33	Square white tower, and dwelling attached	23	Bell struck by hand in answer to signals.
34	Square white tower, with white dwelling SW. of and close to it	30	Hand-bell, rung in answer to signals.
35	White tower and dwelling, covered way, extending nearly to dwelling	23	Hand-bell, rung in answer to signals.
36	Square white tower and dwelling, connected by covered way	28	Hand-bell, rung in answer to signals.
37	White tower and dwelling, connected by a work-room	42	Hand-bell, rung in answer to signals.
38	Square white tower and dwelling, connected by a work-room.	27	Bell, struck by machinery, a single blow every 10 sec.

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

In the column of "Characteristics of light" the time between flashes is given from the beginning of one flash to the beginning of the next succeeding one. The bearings given are *magnetic, and in case of visibility of lights are given from seaward.*

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.

VARIATION OF THE COMPASS.

The variation is given for localities along the coast between the St. Croix River and Whitehead.

LOCALITY.	Compass variation, 1890.	Present annual increase.
Eastport	18¾° W.	¾′
Little River	18¼°	¾′
Machias Bay	18°	1′
Jonesport	17¾°	1′
Off Petit Manan	17½°	1¼′
Frenchman's Bay Entrance	17¼°	1½′
Off Mount Desert Rock	17°	1¾′
Blue Hill Bay Entrance	16¾°	2′
Deer Island Thoroughfare	16½°	2¼′
Off Matinicus Rock	16¼°	2½′
Penobscot Bay, East of Rockland	16¼°	2½′

GENERAL REMARKS ON APPROACHING THE COAST OF MAINE FROM SEAWARD.

Coming from the vicinity of Cape Sable.—Vessels bound to Machias or ports to the eastward of it, should make Machias Seal Island lights and pass to the westward of them. If bound to Eastport or Calais, when 2½ miles northward of these lights haul to the eastward and stand in through the Grand Manan Channel, passing North Shoal and North Rock at a safe distance. This route is preferable to passing to the eastward of Grand Manan, as in case of bad weather coming on an anchorage may be made either at Little River or Machias Bay. To the southward and eastward of Grand Manan there are numerous ledges and dangers to navigation, also strong tidal currents.

It is not desirable for a stranger to pass to the eastward of the Machias Seal Islands or between them and Grand Manan where there are a number of ledges on which the sea breaks in heavy weather, including Bull Rock, an unmarked danger with 2 feet of water over it.

If bound to ports in Penobscot Bay, vessels should steer so as to make either Mount Desert (Rock) light or Matinicus Rock lights. In the former case, on a clear day, Green Mountain, the highest part of Mount Desert Island, may be sighted before the light-house, when the course should be changed so as to bring the mountain to bear about N. ½ E., distant about 23 miles. This will lead very near Mount Desert Rock, from which point a new departure should be taken. When steering for Matinicus Rock lights, Isle au Haut, 556 feet high, on a clear day may be sighted about the same time as the rock.

Coming from the vicinity of Cape Cod or Cape Ann.—Vessels bound into Penobscot Bay or ports to the eastward either steer to make Monhegan light or Matinicus Rock lights. In the winter time the smaller class of vessels and coasters should follow the coast, sighting the principal lights and making an anchorage on the approach of bad weather. East of Monhegan they should use the inland passage.

During thick weather great caution is necessary when approaching the coast, especially to the eastward of Petit Manan where the tidal currents are strong. If one of the off-shore lights has not been made and the position accurately determined before the fog shuts in, it is advisable to keep well outside until it clears. East of Seguin Island, except to the southward and eastward of Grand Manan Island, in clear weather the land will always be made before any of the outlying dangers are encountered, and by keeping 3 miles outside of the headlands and outlying islands, vessels will clear all unmarked dangers.

On all the banks in or near the Gulf of Maine a number of fishing vessels may be found at anchor. They are sometimes very numerous in the South Channel, on the George's Bank and Jeffrey's Ledge. In the summer time a large fleet of mackerel catchers will often be met near the coast between Mount Desert Rock and Cape Ann.

SAILING DIRECTIONS, COAST OF MAINE, OFF SHORE.

From West Quoddy Head to Mount Desert Rock and from thence to points to the southward and westward.—With West Quoddy Head bearing N., distant 1 mile, make good the course SW. by W. ⅝ W. for 71½ miles; Mount Desert (Rock) light should then bear N., distant about 1½ miles. From this position the courses and distances are to:

	Miles.
Matinicus Rock Light-houses, W. ¼ S	33¼
Boon Island Light-house, W. ⅞ S	113½
Isle of Shoals Light-house, W SW. ¾ W	123½
1½ miles SE. of Cape Ann lights, W SW	132½
Whistling Buoy off the Graves, SW. by W. ⅞ W	152½
Main Entrance Boston Harbor, SW. by W. ¾ W	154
Race Point Light-house, SW. ¾ W	146½
Cape Cod (Highlands) Light-house, SW. ½ W	142½

Remarks.—The SW. by W. ⅝ W. course from West Quoddy Head to Mount Desert Rock leads along the shore until abreast Little River, but in no case does the sailing line approach closer than 1¼ miles to the land. After passing Little River the sailing line gradually draws off shore, passing about 3¼ miles south of Libby Island, and nearly 5 miles south of Moose Peak light. After passing the latter light the coast line will become indistinct and only the higher hills and Mount Desert Island can be distinguished.

At night the revolving light on Southwest Wolf Island will be seen on the port quarter until up to Moose Cove;

Machias Seal Island lights will then be made broad off the port bow and Little River light be opened on the starboard bow. When about 3 miles distant from Little River light, Libby Island light will be made well on the starboard bow, and when abreast Cross Island, Moose Peak light will be made on the starboard bow. When Moose Peak light bears N., distant about 5 miles, Petit Manan light will be made broad off the starboard bow; the sailing line passes about 10 miles to the southward of it. Nash Island light may be seen to the northward on a clear night.

When Petit Manan light bears about N NE. Mount Desert (Rock) light should be made about ¾ point on the starboard bow, and about the same time Baker's Island light may be seen on a clear night bearing about NW.

SAILING DIRECTIONS, COAST OF MAINE, ALONG SHORE.

1. ***From West Quoddy Head to the Whistling buoy off Moose Peak light.***—With West Quoddy Head bearing N., distant 1 mile, steer SW. by W. ¾ W. about 14 miles; Little River light will then bear N NW., distant 1¼ miles. From this position steer W SW. ⅛ W. about 18 miles until up to the whistling buoy, 2 miles S SE. from Moose Peak light. From this position follow the directions in Sections 2, 2A, 2B, or 2C, according to destination.

Remarks.—On the SW. by W. ¾ W. course the shore is nowhere approached nearer than 1 mile. At night Southwest Wolf Island light will be seen nearly astern until up to Bailey's Mistake; about the time this light is dropped, Machias Seal Island lights will be made broad off the port bow and Little River light on the starboard bow. The whistling buoy off Little River light will be passed close to. In clear weather in the daytime Machias Seal Island light-towers will be seen to the southward.

On the W SW. ⅛ W. course Old Man and Double Shot islands will be left ⅞ mile on the starboard hand. The sailing line passes about 2 miles south of Libby Island, a little over 2 miles south of Black Head and up to the whistling buoy off Moose Peak light.

At night Libby Island light will be made on the starboard bow just before Little River light is shut out by Little River Head. If Libby Island light has been made and kept in sight, on the SW. by W. ¾ W. course, before Little River light bears abeam, it indicates that the vessel's position is south of the sailing line. When abreast of Cross Island, Moose Peak light should be made on the starboard bow and Avery's Rock light, in Machias Bay, will be opened to the westward of Cross Island. When nearly up to the whistling buoy off Moose Peak light, Petit Manan light will be made on the starboard bow.

Dangers.—All dangers are avoided by giving the shores and outlying islands a berth of ½ mile until abreast of Libby Island light; to the westward of this they are avoided by keeping to the southward of a line from Libby Island light to Moose Peak light.

Smith Reef has a least depth of 17 fathoms over it, and lies 3⅝ miles S. ¼ W. from Libby Island light-house; it is usually marked by tide rips.

Southeast Ledge has a least depth of 7½ fathoms over it, and lies 3½ miles E. by S. from Moose Peak light-house; it is marked by tide rips and in heavy weather by breakers.

2. ***From the Whistling buoy off Moose Peak light to Long Island Head.***—From the whistling buoy steer W SW. ¾ W. about 41½ miles; Long Island Head will then bear N., distant about 1 mile. Follow the directions in Sections 3 or 3A.

Remarks.—Having stood about 14½ miles on the W SW. ¾ W. course, Southeast Rock buoy should be in range with Petit Manan light-house, bearing about N NW. ¾ W. The buoy is left about ⅞ mile on the starboard hand, and when about 14 miles to the westward of it, two islands should be made on the starboard bow.

The sailing line passes 1 mile south of Great Duck Island light, and the same distance south of **Long Island Head.** This head is about 80 feet high and well wooded; it is the southeastern part of Long Island, a thickly wooded island about 1½ miles in diameter and 205 feet high at its highest point.

At night Narraguagus light should be made to the northwestward when passing Crumple Island, and Nash Island light will be opened when well past the ledges lying to the westward of Crumple Island. After passing Petit Manan light, Prospect Harbor light will be opened to the northwestward and Baker's Island light will be made broad off the starboard bow; farther on Winter Harbor light will be opened from behind Schoodic Head, and Egg Rock light may be seen to the westward of it. When Baker's Island light is abeam, Mount Desert (Rock) light will be in sight forward of the port beam. Care must be taken not to pass too close to the southern end of Great Duck Island, which should be distant about 1½ miles broad off the starboard bow when Baker's Island light bears N NE. Great and Little Duck islands shut out Baker's Island light; it is opened again when nearly south of Long Island Head.

Dangers.—**Southeast Rock** has 5 feet of water over it and is surrounded by deep water. It lies 3¼ miles S SE. ¾ E. from Petit Manan light-house, and is marked by a buoy (can, red and black horizontal stripes).

Simms Rock, a detached rock with 6 feet over it, lies 1¾ miles S. from Petit Manan light-house and 1⅞ miles NW. by W. from Southeast Rock. It is marked by a buoy (nun, red and black horizontal stripes) which should be given a berth of at least ¼ mile.

Ledges make out about ¼ mile to the southward from the south end of Great Duck Island. These show partly bare at low water, and are avoided by giving the southern end of the island a berth of at least ½ mile.

2 A. ***From the Whistling buoy off Moose Peak light to the Eastern Approach to Southeast Harbor.***—From the whistling buoy steer W. ¼ S. about 16¼ miles to the whistling buoy off Petit Manan. From the latter steer W. ¼ N. about 16¼ miles, passing to the

southward of the whistling buoy off Schoodic Island and a little over ¼ mile north of the beacon on East Bunker's Ledge; then proceed as directed under the heading "Southwest Harbor."

Remarks.—The **W. ¼ S.** course leads 1¼ miles to the southward of the islands and ledges which extend about 5 miles to the westward from Moose Peak light-house and a little over ⅜ mile to the southward of Tibbett Rock. Jackson Ledge, 3¾ fathoms of water, will be left about ⅝ mile on the starboard hand. The entrances to Moose-a-bee Reach, and Pleasant, Narraguagus, and Pigeon Hill bays, are left on the starboard hand between Egg Rock and Petit Manan Island. When nearly up to the whistling buoy off Petit Manan, Simms Rock buoy will be left ¾ mile on the port hand. **At night** Petit Manan light will be on the starboard bow. When Nash Island light bears **NE. ¾ N.** Tibbett Rock will be passed and Jackson Ledge should be just forward of the starboard beam; the whistling buoy should be ahead and be heard at this distance under favorable conditions.

On the **W. ¼ N.** course Schoodic Island will be on the starboard bow, and left nearly ½ mile on the starboard hand. The entrances to Dyer's and Gouldsborough bays and Prospect Harbor are left on the starboard hand between Petit Manan and Schoodic Island. After passing the whistling buoy off Schoodic Island, Frenchman's Bay will be opened to the northward, and while crossing the entrance of this bay the beacon on East Bunker's Ledge should be made a little on the port bow, and the eastern approach to Southwest Harbor will be ahead. **At night** Baker's Island light should be made after passing Petit Manan, and Petit Manan light should be kept bearing to the northward of **E. ½ N.** until Egg Rock light is made and bears **NW.**, or until up to the whistling buoy off Schoodic Island. When approaching East Bunker's Ledge and Baker's Island light bears **SW.**, Bear Island light should be made a little on the starboard bow.

Dangers.—**Sea Horse Rock** is the westernmost of the ledges which extend in a broken line about 5 miles to the westward from Moose Peak light-house. It is small, bare at half tide, and lies about ⅝ mile to the westward of Egg Rock.

Tibbett Rock, a small rock with 12 feet over it, lies 3⅝ miles **E.** from Petit Manan light-house and 5 miles **SW. ¾ S.** from Nash Island light-house. The rock is not marked except by breakers when there is a heavy swell.

Jackson Ledge is nearly ¼ mile in diameter, and has a least depth of 3¾ fathoms; it lies 2½ miles **E.** by **S.** from Petit Manan light-house, and should be left on the starboard hand when approaching Petit Manan from off Moose Peak light.

Simms Rock and **Southeast Rock.** See dangers, under Section 2, preceding.

Petit Manan Reef makes off nearly ½ mile to the southward from Petit Manan Island. It is marked by a buoy (can, red, No. 2), which is placed off its southern end, and should not be approached from the southward closer than 200 yards.

Moulton's Ledge, showing partly bare at low water, is about 350 yards in diameter, and marked by a buoy (spar, red and black horizontal stripes) placed to the southwestward of it. This ledge lies 3 miles **W NW. ¾ W.** from Petit Manan light-house. About ⅝ mile **S.** from Moulton's Ledge is an unmarked spot with 18 feet of water over it.

A reef makes out about 400 yards to the southward from Schoodic Island. Vessels should keep to the southward of the whistling buoy.

Otter Cliff Ledge, bare at half tide, lies ¼ mile **E SE.** from Otter Cliff and 3⅝ miles **SW. ¾ W.** from Egg Rock light-house; it is marked by a black bell buoy placed ⅛ mile **SE.** from the ledge.

2 B. ***From the Whistling buoy off Moose Peak light-house to Bass Harbor Bar.***—From the whistling buoy steer **W. ¾ S.** about 31½ miles, passing nearly 2½ miles south of Petit Manan and about ½ mile south of Simms Rock buoy. When up to the whistling buoy, which is 1½ miles **SE. ¾ S.** from Baker's Island light-house, steer **W NW. ⅞ W.** a little over 7 miles (see Section 1, "Sailing Directions, Bass Harbor").

At night.—Follow the directions in Section 2, page 21, until Petit Manan light bears **N.**, distant about 4 miles; then steer **W. ⅛ S.** about 15 miles to the whistling buoy off Baker's Island; the course is then **W NW. ⅞ W.**, with Bass Harbor Head light a little on the starboard bow, and the sailing directions for Bass Harbor, Section 1, should be followed.

Remarks.—On the **W. ¾ S.** course Petit Manan light will be on the starboard bow. The sailing line passes over 1¼ miles to the southward of Tibbett Rock and Jackson Ledge. Southeast Rock buoy should be left ½ to ¾ mile on the port hand, and as Petit Manan light approaches the bearing of **N.** by **W. ¼ W.** be careful that Simms Rock buoy is left at least ⅝ mile on the starboard hand. After passing Simms Rock there are no dangers. Baker's Island will be made on the starboard bow, and on drawing near the island the whistling buoy will be made ahead. On the port bow Little Duck and Great Duck islands will be the nearest land. From the whistling buoy, see directions, remarks, and dangers in Section 1, "Sailing Directions, Bass Harbor."

At night it is advisable to pass outside the dangers lying to the southward of Petit Manan. The **W SW. ¾ W.** course from the whistling buoy off Moose Peak light-house leads to the southward of all dangers and about 4 miles south of Petit Manan light. On the **W. ⅛ S.** course Baker's Island light will be made on the starboard bow, and the lights described in the remarks under Section 2 A, will be made to the northward in the order named.

For dangers between the whistling buoy off Moose Peak light-house and Baker's Island see "Dangers," in Sections 2 and 2 A, preceding.

2 C. ***From the Whistling buoy off Moose Peak light-house to a position ¾ mile south of Matinicus Rock.***—From the whistling buoy steer **W SW. ⅝ W.** This course made good for 71 miles leads 5 miles south of Petit Manan light-house, about 3 miles south of Great Duck

Island and Long Island Head, 3 miles south of Seal Island, and $\frac{3}{4}$ mile south of Matinicus Rock. For bearings and distances from Matinicus Rock light-houses see page 15.

Remarks.—The **W SW.** $\frac{5}{8}$ **W.** course leads well to the southward of all dangers. Southeast Rock, the nearest, will be left about $1\frac{3}{4}$ miles on the starboard hand when Petit Manan light bears **N NW.** $\frac{1}{2}$ **W.** In clear weather Mount Desert (Rock) light will be seen about 8 miles to the southward when nearly abreast Great Duck Island, and Green Mountain, on Mount Desert Island, will be in sight during the entire run.

At night Nash Island and Narraguagus lights will be seen to the northward; Petit Manan light will be broad off the starboard bow. After passing the latter, Baker's Island light will be made broad off the starboard bow, and Prospect Harbor light and Winter Harbor light will be made to the northward; on a clear night Egg Rock light may be seen to the westward of Winter Harbor light; Mount Desert (Rock) light will be made broad off the port bow about the time that Winter Harbor light bears **N.** About the time that Mount Desert (Rock) light is dropped, Saddleback Ledge light will be made, bearing about **NW.** by **W.** $\frac{1}{2}$ **W.**; when the latter bears about **NW.** by **N.** Matinicus Rock lights should be made on the starboard bow.

3. ***From Long Island Head to Monhegan through Two Bush Channel.***—When Long Island Head bears **N.**, distant about 1 mile, steer **W.** $\frac{7}{8}$ **S.** about $14\frac{1}{4}$ miles; Roaring Bull spindle should then bear **N.**, distant nearly $\frac{3}{4}$ mile. Then steer **W.** $\frac{3}{4}$ **N.** about $21\frac{7}{8}$ miles, or, until Whitehead light bears **N NE.**, distant $2\frac{5}{8}$ miles, and Tennant's Harbor light **NW.** Then steer **SW.** by **W.** $\frac{1}{4}$ **W.**, nearly $12\frac{1}{2}$ miles; Monhegan light will then bear **S SE.**, distant $1\frac{1}{2}$ miles, and the whistling buoy will be a little over $\frac{1}{4}$ mile distant on the port beam. Then follow the directions in Section 4, following.

Caution.—The tidal current sets to the northward on the flood and to the southward on the ebb. When crossing the entrance to Penobscot Bay on the **W.** $\frac{3}{4}$ **N.** course, the navigator should frequently check his position by bearings.

Remarks.—On the **W.** $\frac{7}{8}$ **S.** course Isle au Haut, large, high, wooded island, will be on the starboard bow. As it is approached a number of small islands and rocks will be seen to the eastward of it; the southernmost of these should not be approached nearer than $1\frac{1}{4}$ miles, and the southern end of Isle au Haut should be given a berth of $1\frac{1}{2}$ miles. The approach to Burnt Coat Harbor and Jericho Bay is between Long Island and Isle au Haut. **Eastern Head** is the southeastern point, and **Western Head** the southwestern point of Isle au Haut. **At night** when nearly midway between Long Island Head and Isle au Haut, Burnt Coat Harbor light will be opened between the islands to the northeastward. When Eastern Head bears about **N.**, Saddle Back Ledge light will be opened broad off the starboard bow from behind Western Head and Western Ear; the lights on Matinicus Island may be made broad on the port bow shortly after.

On the **W.** $\frac{3}{4}$ **N.** course Saddle Back Ledge light and the ledges and islands to the southeastward of Vinal Haven Island will be left $2\frac{1}{2}$ miles on the starboard hand, and when Heron Neck light bears **N.**, by **E.** $\frac{1}{4}$ **E.**, distant $3\frac{3}{4}$ miles, Bay Ledge buoy should be $\frac{5}{8}$ mile distant on the starboard beam. **Two Bush Island**, the southernmost of the islands east of Muscle Ridge Channel, will be made on the starboard bow, and should be left $1\frac{1}{4}$ miles on the starboard hand. When about 6 miles past Bay Ledge buoy, a good lookout should be kept for the buoy marking the Northern Triangles, which should be left about $\frac{1}{2}$ mile on the port hand. While crossing West Penobscot Bay entrance the Camden Hills will be the highest land seen to the northward on the western shore of the bay. **At night** a bow and beam bearing should be taken on Saddle Back Ledge light, and when Heron Neck light approaches a **N.** bearing a good lookout should be kept for Bay Ledge buoy. To avoid Bay Ledge do not get Saddle Back Ledge light bearing to the eastward of **E NE.** $\frac{3}{4}$ **E.** until Heron Neck light bears to the eastward of **N.** by **E.** $\frac{1}{2}$ **E.** To avoid the Northern Triangles do not bring Tennant's Harbor light to bear to the northward of **NW.** by **W.** $\frac{3}{4}$ **W.** until Whitehead light bears **NW.** $\frac{1}{4}$ **N.** Whitehead light is shut out by the islands to the eastward until it opens clear of Two Bush Island on a bearing of **NW.** $\frac{1}{2}$ **W.**

On the **SW.** by **W.** $\frac{1}{4}$ **W.** course Monhegan Island will be on the port bow, the northern end of Metinic Island will be left $1\frac{3}{4}$ miles on the port hand and Metinic Island Ledge buoy about $\frac{1}{2}$ mile on the port hand. Tennant's Harbor light and Marshall's Point light are left on the starboard hand. Burnt and Allen's islands, two large high wooded islands at the southeastern entrance to Muscongus Bay, will be on the starboard bow and are left about $1\frac{3}{4}$ miles on the starboard hand. **At night** Monhegan light will be on the port bow; Marshall's Point light will be seen at intervals between the islands off the entrance to Herring Gut (Port Clyde). The dangers on the north side are avoided by keeping Whitehead light bearing to the northward of **NE.** by **E.** Metinic Island Ledge and Roaring Bull are avoided by keeping Monhegan light bearing to the southward of **SW.** $\frac{1}{2}$ **W.** When approaching the northern side of Monhegan the whistling buoy will generally be heard when some distance from it.

Dangers.—**Cold Ledge**, small, with 7 feet over it, is about $2\frac{1}{8}$ miles **E.** $\frac{1}{8}$ **S.** from Eastern Head.

Eastern Ear Ledge, bare at low water, lies about $\frac{1}{2}$ mile **S.** by **E.** $\frac{1}{2}$ **E.** from the eastern end of Eastern Ear; it is about 600 yards long **N NE.** and **S SW.**, and is not marked, but the sea breaks on it at all times.

Cape Ann Ledge and **Western Ear Ledge** are described under Section 1, "Sailing Directions, East Penobscot Bay."

Roaring Bull Ledge, bare at half-tide and marked by a spindle (iron, red), lies about $1\frac{1}{4}$ miles **SW.** $\frac{1}{2}$ **W.** from Eastern Head and about $1\frac{1}{8}$ miles **SE.** from Western Ear. Strangers should keep to the southward of it.

The ledges lying to the southward of Vinal Haven Island are avoided by giving the southernmost islands and ledges that show above water a berth of 1 mile while to the southward of them.

Bay Ledge, a small ledge bare at low water, lies $3\frac{1}{2}$ miles **S.** by **W.** $\frac{1}{4}$ **W.** from Heron Neck light-house, and $6\frac{1}{2}$ miles **W.** by **S.** from Saddle Back Ledge light-house; it is marked by a buoy (nun, red, No. 2), which should be given a berth of $\frac{1}{4}$ mile.

Northern Triangles is a group of detached ledges 1⅛ miles long in an E SE. and W NW. direction; they lie about 1⅛ miles to the northward of Little Green Island, on the south side of the Two Bush Channel. As a guide through Two Bush Channel and to the northward of these ledges there is a buoy (nun, black, No. 1), which bears N NE. ½ E., distant 1⅝ miles from the western end of Little Green Island.

Alden's Rock, a detached rock with 4 feet of water over it, lies about 2¾ miles E NE. ½ E. from the northern end of Metinic Island; it is marked by a buoy (spar, red and black horizontal stripes) placed to the southward of it.

Crow Island Ledges extend 1¼ miles to the westward of Two Bush Island and consist of a number of rocks with 8 to 15 feet over them. A buoy (spar, red, No. 2) marks their western end, which should be left on the starboard hand by vessels coming from the eastward.

Metinic Island Ledge is nearly ¼ mile long in an E NE. and W SW. direction, and has a least depth of 2 feet. It lies 1⅞ miles W. by N. from the northern end of Metinic Island, and is marked off its southwestern end by a buoy (spar, red and black horizontal stripes).

Hooper's Shoal is a small unmarked shoal with a depth of 17 feet over it, lying 2¼ miles W. from the northern end of Metinic Island, and 1⅞ miles NE. from Roaring Bull.

Roaring Bull (Black Ledge) is awash at low water and generally marked by breakers; it lies 2¾ miles W NW. ¾ W. from Metinic Green Island and 7¾ miles NE. by E. from Monhegan light-house. A buoy (nun, black, No. 1) is placed about 100 yards NW. from the shoalest part of the ledge.

Old Cilley Ledge is about ½ mile long in an E. by S. and W. by N. direction, with both ends dry at low tide. It lies about 1½ miles NE. from Burnt Island and is marked off its eastern end by a buoy (can, red, No. 4).

Duck Rocks are several detached rocks about 1 mile north of Monhegan light-house. A black tripod beacon marks one of these rocks, a black spar buoy (No. 3) marks another, and a black whistling buoy is placed to the northward of all. Strangers should pass north of the whistling buoy.

3 A. ***From Long Island Head to Monhegan, passing south of Matinicus Rock.***—When Long Island Head bears N., distant about 1 mile, steer SW. by W. ⅞ W. about 29 miles; Matinicus Rock lights should then bear N., distant about ¾ mile. From this position steer W NW. ¼ W. to pass north of Monhegan Island, or, W. ⅝ N. about 19½ miles to pass south of the island; in either case give its shores a berth of 1½ miles. When Monhegan light bears N., distant 2 miles, follow the directions in Section 4 A, following.

Remarks.—On the SW. by W. ⅞ W. course Eastern Head, Isle au Haut, should be 4½ miles distant when abeam. Seal Island will be made on the starboard bow and left 2¼ miles on the starboard hand; when it bears abeam, Matinicus Rock should be about 7 miles distant on the starboard bow. At night Saddle Back Ledge light will be made when it bears NW. by W. ½ W. Matinicus Rock lights will be made on the starboard bow. To avoid all the dangers to the northward of the sailing line, keep Matinicus Rock lights bearing to the westward of SW. by W. ½ W.

The distance from Matinicus Rock to Monhegan is 20 miles. The eastern side of Monhegan presents high, dark, bluff, rocky faces; the light-house is near the middle of the island, on its highest point, about 140 feet above the sea. At night Monhegan light will be made soon after passing Matinicus Rock.

On a clear night Whitehead light may be seen to the northward.

Dangers.—**Three Fathom Ledge** has 3½ to 8 fathoms over it, and lies 1⅝ miles E NE. ¾ E. from the eastern end of Seal Island. The sea breaks on it in heavy gales.

Malcolm's Ledges lie in the middle of the passage and between Seal and Wooden Ball islands. They have a length of 800 yards N NE. and S SW. and are bare at both ends, with 3 to 5 feet of water between them. **Gully Ledge**, with 6½ fathoms, lies about ⅝ mile W. from Seal Island. **Frenchman's Ledge**, with 7¼ fathoms, lies about ¾ mile E SE. from the northeastern end of Wooden Ball Island.

South Breaker is a small ledge, bare at low water of spring tides, lying 1⅝ miles NW. by W. from Matinicus Rock light-houses; it is marked by a buoy (spar, red and black horizontal stripes) placed SW. from it.

Haddock Ledge, a small ledge with 13 feet of water over it, lies 7½ miles E NE. ¾ E. from Monhegan and 2½ miles SW. ¼ S. from Metinic Green Island. The sailing lines pass well to the southward of this ledge.

Allen's Shoal is a small area with 5½ fathoms water over it, lying 1⅛ miles E. from the northeastern point of Monhegan Island.

Duck Rocks are described under Section 3.

Gull Rock Ledge has 3¾ fathoms over it, and lies ⅝ mile S SE. from Monhegan. To avoid this ledge give the south shore of the island a berth of over 1 mile.

4. ***From the Whistling buoy north of Monhegan to Wood Island Light.***—When the whistling buoy bears S., distant ¼ mile, steer W. ¾ S. about 13½ miles; the whistling buoy off Bantam Rock will then bear N., distant about ½ mile. Then:

If bound to Casco Bay or Portland, steer W. ⅜ N. This course continued for 25½ miles leads to Portland Head, passing about 1¾ miles south of Seguin Island and ¾ mile south of Halfway Rock.

To stand along shore, keeping in sight of the lights at night and passing outside of all dangers, steer W SW. ½ W. about 31½ miles; Wood Island light should then bear NW., distant 4 miles. Then follow the directions in Section 5 or 5 A, following.

Remarks.—On the W. ¾ S. course Muscongus Bay, John's Bay, and Damariscotta River will be on the starboard hand. Damiscove and the other islands lying off Boothbay will be on the starboard bow, and the southernmost Pumpkin Island should be left nearly 2½ miles on the starboard hand. The whistling buoy off Bantam Rock should

View of Wood Id., the Lt. Ho. bearing NW. by W. ½ W., distant 1¾ Miles.

Cape Ann Lt. Houses bearing S. ¾ W., distant 6½ Miles.

be made on the starboard bow and left about ½ mile on the starboard hand. **At night** Pemaquid light will be in sight to the northward, and Seguin light will be on the starboard bow. When Pemaquid light bears about **N.**, Pond Island light should be made to the northward of Seguin light. When up to the whistling buoy, Burnt Island light in Boothbay will be seen bearing **N.** by **E.** and Monhegan light will be in sight on the port quarter.

On the **W. ⅝ N.** course Seguin Island will be left 1½ miles on the starboard hand, and Small Point about 2 miles on the starboard hand. After passing the latter, Halfway Rock light will be made a little on the starboard bow; it should be left about ¾ mile on the starboard hand, and the whistling buoy about ½ mile on the port hand. After passing Halfway Rock, Portland Head light should be made directly ahead (see directions for entering Portland Harbor). **At night,** Halfway Rock light should be made a little on the starboard bow when Seguin light bears about **NW.** When abreast Cape Small, Cape Elizabeth lights should be made on the port bow, and shortly afterwards Portland Head light will be made ahead and to the southward of Halfway Rock light. Seguin light should be in sight on the starboard quarter until nearly up to Portland Head.

On the **W SW. ½ W.** course the sailing line leads well outside Casco Bay and the outlying ledges. Halfway Rock light will be left about 7 miles on the starboard hand, and Cape Elizabeth lights about 6¼ miles on the starboard hand. Wood Island light will be made well off the starboard bow, and when it approaches a **NW.** bearing, Goat Island light and Cape Porpoise will be a little on the starboard bow. **At night,** Halfway Rock light will be made broad off the starboard bow when Seguin light bears about **N NW.**; Cape Elizabeth lights and Portland Head light will be made shortly afterwards, in the order named, when Cape Small is abeam. When Cape Elizabeth lights approach a **NW.** bearing, Wood Island light will be made on the starboard bow, and when it bears about **W NW.**, Goat Island light will be made a little on the starboard bow.

Dangers.—**Moser's Ledge,** a comparatively small ledge with 17 feet over it, lies nearly 3¾ miles **SE. ¾ E.** from Pemaquid light-house. The sailing line passes about 3 miles to the southward of it.

Outer Pumpkin Island Ledge is small and has a depth of 5¾ fathoms. It lies nearly 1¼ miles **S. ½ W.** from Pumpkin Island, the southeasternmost of the islands lying to the southeastward of Boothbay. This ledge is not marked; it is left about 1¼ miles on the starboard hand.

Southeast Breaker, a small ledge with 3¼ fathoms over it, lies nearly ¾ mile **SE. ¾ S.** from the southern end of Pumpkin Island.

Pumpkin Island Eastern Ledge, a small, unmarked ledge with 10 feet of water over it, lies about ⅝ mile **E SE. ¼ E.** from the southern end of Pumpkin Island.

Pinkham Shoal, a small, unmarked ledge with 12 feet of water over it, lies nearly ⅝ mile **SW.** from the southern end of Pumpkin Island.

Bantam Rock shows bare at low water, and lies a little over 1¼ miles **S SW. ¾ W.** from the southern point of Damiscove Island. It is marked by a buoy (nun, red, No. 2) placed about 100 yards to the southwestward from the dry part of the ledge. A whistling buoy is placed 1½ miles **S SW.** from the nun-buoy, and a short distance to the southward of a small ledge, with a depth of 4 fathoms over it. Vessels standing along the coast should not pass inside of the whistling buoy.

Mile Ledge, with 10 feet of water over it, lies 1 mile **S. ½ W.** from Seguin light-house; it is marked by a buoy (can, red and black horizontal stripes), placed about 100 yards **S.** from it. There is good water between this ledge and Seguin Island, but vessels standing along the coast gain nothing by passing inside.

For dangers crossing Casco Bay, see sailing directions under the headings "Casco Bay" and "Portland Harbor."

4 A. ***From a position about 1½ miles S. of Monhegan Island.***—If bound to any port between Boothbay and Cape Elizabeth, steer **W. ⅜ N.** This course continued for 39½ miles leads up to Portland Head, passing ½ mile **S.** of the whistling buoy off Bantam Rock, 1¾ miles **S.** of Seguin Island, and ¾ mile **S.** of Halfway Rock.

Or, to stand along shore, keeping in sight of the lights at night and passing outside of all dangers, steer **W. ⅞ S.** for 45 miles. Wood Island light should then bear **NW.**, distant 4 miles. Then follow the directions in Section 5 or 5 A, following.

Remarks.—On the **W. ⅜ N.** course, Damiscove and the other islands lying off the entrance to Boothbay will be left about 3¼ miles on the starboard hand. The whistling buoy off Bantam Rock should be made on the starboard bow, and left ½ mile on the starboard hand. See also the remarks under Section 4, preceding. **At night,** to avoid the whistling buoy off Bantam Rock, keep Monhegan light bearing to the northward of **E. ¼ N.** until the white ray of Burnt Island light in Boothbay bears **N.** by **E. ½ E.**

On the **W. ⅞ S.** course the sailing line leads nearly 4 miles south of the nearest dangers. Seguin light, Halfway Rock light, Cape Elizabeth lights, Portland Head light, and Wood Island light will be made broad off the starboard bow in the order named, and when Wood Island light bears about **W NW.** Goat Island light will be made about 1 point on the starboard bow.

5. ***From Wood Island light to Cape Ann.—To pass to the westward of Boon Island and Isles of Shoals.***—With Wood Island light bearing **NW.**, distant 4 miles, steer **SW. ¼ W.** about 31¾ miles; Isles of Shoals light should then bear **E SE.**, distant nearly 2 miles. The course from this position is **S. ¼ E.** about 18¾ miles, when Straitsmouth light should bear **W SW.** and be in range with the beacon on the Dry Salvages, the latter being 1¼ miles distant on the starboard hand. Then steer **S.** by **W. ¾ W.** and pass about 1 mile **E.** of Cape Ann lights,

Remarks.—On the **SW. ¼ W.** course, after having made a little over 20 miles, Boon Island light should be about 2 miles distant on the port beam, and Cape Neddick about 3¾ miles on the starboard hand. The entrance to York River will be seen to the southwestward of the cape. When about 3¾ miles past Boon Island, York Ledge should be nearly on the starboard beam and left about 1 mile on the starboard hand; about 1¾ miles farther, Murray's Rock should be left 1 mile on the starboard hand. Duck Island, the northernmost of the Isles of Shoals, should be left about 1¼ miles on the port hand. The entrance to Portsmouth Harbor will be about 3 miles off the starboard beam. Appledore (Hog) Island, the largest of the Isles of Shoals, and some of the other islands, have hotels which show conspicuously. **At night** Goat Island light will be broad off the starboard bow, and Boon Island light will be made on the port bow. After passing Goat Island light, Cape Neddick light should be made on the starboard bow, and when it bears about **W.**, Isles of Shoals light will be made on the port bow, if not shut in by the hotels on the islands to the northward. Whale's Back light, at the entrance to Portsmouth Harbor, should be made about the time that Boon Island light bears abeam. Portsmouth Harbor (New Castle) light will open out on the starboard beam when nearly abreast the northern end of the Isles of Shoals. When abreast the Isles of Shoals, Newburyport light should be made ahead.

On the **S. ¼ E.** course, Cape Ann and Straitsmouth lights will be made off the starboard bow. The beacon on the Dry Salvages will show conspicuously on a clear day; it should be left 1 mile to 1½ miles on the starboard hand on this course. **At night** Whale's Back and Portsmouth Harbor lights will be a little on the port quarter. Cape Ann lights will be made soon after passing the Isles of Shoals. Ipswich and Annisquam lights will be made broad off the starboard bow. Straitsmouth light will be made off the starboard bow when Newburyport light bears about **W.** To clear the Dry Salvages, do not approach Straitsmouth light from the northward nearer than 1¾ miles until Cape Ann lights bear to the westward of **S SW. ¾ W.** and steer so as to pass about 1 mile to the eastward of them.

On the **S. by W. ¾ W.** course the spindle on the Londoner will be made on the starboard bow and should be left ½ mile on the starboard hand.

Dangers.—**Boon Island** is a small, low, rocky islet, about 5¾ miles **SE. by E. ½ E.** from Cape Neddick; it is marked by **Boon Island light.** The island is surrounded by deep water, but there are several detached ledges to the eastward and one to the southwestward of it.

Pollock Rock, with 17 feet over it, is a small ledge lying ¾ mile **W SW. ¼ W.** from Boon Island light-house. There is a depth of 10 fathoms between this rock and Boon Island, but vessels should not attempt to pass between them. The sea breaks heavily over the rock in strong gales.

Boon Island Ledge, showing bare at extreme low tides, lies 2¾ miles **E. ½ S.** from Boon Island light-house. A whistling buoy (red and black horizontal stripes, "**B. I. L.**" in white letters) is placed about 300 yards to the southeastward of it. Commencing about 1⅜ miles **E.** of Boon Island light-house and extending toward Boon Island Ledge is a ledge with from 4½ to 6½ fathoms over it on which the sea breaks in heavy weather.

York Ledge is about ¾ mile long in an **E NE.** and **W SW.** direction, and shows partly bare at three-quarters ebb. It lies about 4 miles **S.** by **W.** from Cape Neddick light-house, and is marked by a spindle (iron, 28 feet high, with cage on top). The sunken part of the ledge extends about ½ mile to the northeastward and ¼ mile to the westward from, the spindle.

The Triangles is an extensive shoal ground, nearly 1 mile in diameter, with 4 to 6 fathoms of water; its eastern end is about 4¼ miles **E. ¼ S.** from Whale's Back light-house and 1⅜ miles **SW. by S.** from the spindle on York Ledge. **Murray's Rock**, with 6 feet of water over it, is near the southeastern side of The Triangles; it is marked by a buoy (nun, red and black horizontal stripes) placed about 100 yards **S SE.** from the shoalest part of the rock. Vessels coming from the northward should pass at least ½ mile to the eastward of this buoy. There are spots with 4 to 6½ fathoms over them between The Triangles and York Ledge, and with 3¼ to 6 fathoms between The Triangles and the northern point at entrance to Portsmouth Harbor.

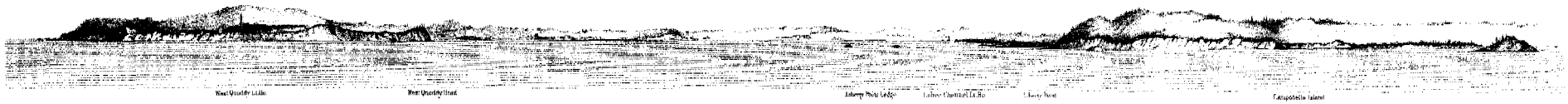
Isles of Shoals (see description under that heading). Vessels standing along the coast to the westward of the islands will avoid all dangers by giving them a berth of about ½ mile.

Dry Salvages and other dangers lying to the northeastward of Straitsmouth light-house are described under heading "Rockport Harbor"; they are avoided by giving Straitsmouth light a berth of 1½ miles.

5 A. ***From Wood Island light to Cape Ann.—To pass to the eastward of Boon Island.***—From a position 4 miles **SE.** of Wood Island light, steer **S SW. ½ W.** This course made good about 49 miles leads about 4¾ miles **E.** of Boon Island to a position about 1 mile **E.** of Cape Ann.

Remarks.—On this course, when Boon Island light bears **W. ¾ N.**, the whistling buoy off Boon Island Ledge should be in range with the light distant about 2 miles. On a clear day the Isles of Shoals will be made off the starboard beam distant about 7½ miles. Cape Ann will be made on the starboard bow, and as it is approached Cape Ann light-houses and Thatcher's Island should be readily distinguished. The beacon on Dry Salvages should be left about 1½ miles on the starboard hand. **At night** Boon Island light will be made when Goat Island light bears about **W.**; Cape Neddick light will be made broad off the starboard bow. When Boon Island light bears about **W.**, Isles of Shoals light will be made, and on a clear night Whale's Back light will be visible just forward the starboard beam. When Isles of Shoals light bears about **W NW.**, Cape Ann lights should be made on the starboard bow, and as they are approached, if the night is clear, the lights in Ipswich Bay will be visible. Straitsmouth light will be made when about 13 miles distant from Cape Ann lights.

Dangers.—**Boon Island** and the adjacent dangers are described under Section 5 preceding. The sailing line passes 2 miles to the eastward of Boon Island Ledge and the whistling buoy. See also heading "Rockport Harbor" for dangers to the northeastward of Cape Ann.



Approaches to Eastport through Lubec Narrows, West Quoddy Head Light bearing W. ¾ N. distant 2¾ Miles.

Approaches to Little River from the Eastward, the Light bearing N.W. by W. distant 3 Miles.

Approaches to Little River from the Westward, Little River Island bearing N.N.E. distant 2¼ Miles.

ST. CROIX RIVER AND APPROACHES.†

The St. Croix River forms part of the boundary between the United States and New Brunswick, and is of considerable commercial importance; the entrance is approached through several channels leading between the islands on the New Brunswick side and the shore of the United States. The waters comprising the approaches to the St. Croix River—Quoddy Roads, Lubec Narrows, Friar Roads, and Passamaquoddy Bay—have numerous tributary bays and rivers, the principal ones on the shore of the United States, being Johnson's Bay and Cobscook Bay; the latter is the approach to South Bay, Pennamaquan River, and the North and South Branch Cobscook rivers. With the exception of Lubec Narrows, Cobscook Bay and tributaries, and the upper part of the St. Croix River, these waters are exceptionally free from dangers; the shores are bold-to along the channel ways with but few exceptions. The tidal currents are strong, and sailing vessels can make no headway beating against them.

A detailed description of the approaches to the St. Croix River follows in the order in which they would be used in approaching from a port in the United States.

QUODDY ROADS AND LUBEC NARROWS.

Quoddy Roads lies between the southwestern end of Campobello Island and West Quoddy Head, marked by a light-house; it is the usual anchorage for vessels seeking shelter against northerly and westerly winds or waiting for a favorable tide to pass through Lubec Narrows. The entrance between Liberty Point Ledge and West Quoddy Head is about ¾ mile wide, with a least depth of 28 feet near the middle of the entrance; the best water leads about ¼ mile to the eastward of West Quoddy Head (see current notes). The anchorage affords shelter against all but east and southerly winds in 12 to 25 feet of water at low tide; vessels anchored here for shelter when the wind hauls to the eastward, get under way and pass through Lubec Narrows to the anchorage in Johnson's Bay. The western part of the roads between West Quoddy Head and Lubec is full of shoals, partly bare at low water, on which are numerous fish weirs.

The channel leading from the roads to Lubec Narrows is being improved, under the supervision of the General Government, by dredging; it has now (1891) a least width of 200 feet and a depth of 12 feet throughout at mean low water, but low spring tides may fall 4 feet below this level. On its western side and about ¾ mile **S. ⅞ W.** from Leadurny Point, it is marked by **Lubec Channel light-house** (see table page 16). The average draught of vessels passing through this channel is 12 feet; the deepest draught is 19 feet. It is necessary for sailing vessels to have a fair wind to pass through the dredged channel and the narrows, the most favorable time being about 2 hours before high water, but sailing vessels with a strong, fair wind can stem an adverse current at any time after half flood or ebb.

Lubec Narrows is a narrow strait between Mulholland Point (marked by a light-house) and the town of Lubec. The channel is straight but narrow, with very strong tidal currents and eddies; the flood current has a velocity of 6 knots and the ebb 8 knots during spring tides (see current notes). The town of **Lubec** is situated on the northern side of West Quoddy Roads, on a peninsula separating the roads from Johnson's Bay; it is of little commercial importance. The wharves are all dry at low water, and are only used by small vessels which sometimes ground out here for repairs.

JOHNSON'S BAY

is the bight to the westward of Lubec, about 2½ miles **S SW.** from Eastport. This is a well sheltered anchorage for vessels of any draught, and much frequented by vessels of all sizes in the spring and fall; it is approached from the southward through Quoddy Roads and Lubec Narrows, and from the northward through Friar Roads. The southwestern part of Johnson's Bay is shoal, the best anchorage for heavy draught vessels being just to the southward of a line from Mulholland Point light to Rodger's Island.

FRIAR ROADS (EASTPORT HARBOR)

is on the western side of Campobello Island, north of Johnson's Bay and east of Moose Island (Eastport); it is approached from the northward around East Quoddy Head, and from the southward through Quoddy Roads and Lubec Narrows, and is the principal approach to Passamaquoddy Bay and St. Croix River. Vessels seldom anchor in Friar Roads, as the water is deep and the bottom, as a rule, foul.

De Lute Harbor, in the northwestern part of Campobello Island, is sometimes used as an anchorage by small vessels.

Friar Bay, a broad bight in the west shore of Campobello Island, **S SE.** from Eastport, is sometimes used as an anchorage.

Broad Cove, in the south shore of Moose Island, and west of Eastport, is a good anchorage for vessels of any draught; vessels anchored off Eastport get under way and anchor here or in Johnson's Bay to ride out a gale.

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† Quoddy Roads and Eastport Harbor are shown on chart **302A**, scale $\frac{1}{40,000}$, price $0.20. The approach to Quoddy Roads is shown on chart **101 A**, scale $\frac{1}{80,000}$, price $0.50. Chart No. **101** is now in preparation, scale $\frac{1}{80,000}$. It will show the St. Croix River and all its approaches as far as Calais, Me.

The channel leading into Friar Roads from the northward is deep and unobstructed; the shores are bold-to and the few ledges can be avoided by noticing the ranges of some of the islands.

Eastport.—This town is situated on the southeastern end of Moose Island. It is of considerable commercial importance, its principal business being in lumber, fish, and general merchandise. Vessels loading generally lie at the wharves, some of which are dry at low water; others have from 5 to 12 feet at their ends. The best anchorage off the town is just to the northward of the revenue cutter's moorings, which are marked by a buoy. The passage leading into Passamaquoddy Bay and St. Croix River is just to the northward of the town and the entrance to Cobscook Bay, south of it.

Pilots.—As pilotage is not compulsory, Canadian pilots can take vessels into Maine ports, but Maine pilots are not allowed to take vessels into Canadian ports. Vessels coming from the eastward will find Canadian pilots cruising off Machias Seal Island, or, if not there, at Little River, where both American and Canadian pilots will be found. If a pilot is not taken off shore, Canadian licensed pilots, and fishermen who are competent pilots for Maine ports, will be found at Head Harbor, near the north end of Campobello Island. Vessels coming from the westward may take a pilot off Little River or at West Quoddy Roads. Pilots for St. Croix River and Cobscook Bay can be found at Eastport.

Supplies.—Coal and water can be had alongside some of the wharves. Provisions and ship chandler's stores can be obtained in the town.

Repair.—Light repairs can be made, vessels being hauled out on the beach to be cleaned and calked.

Steamers of the International Steamship Company stop at Eastport on their trips from Boston, Mass., to St. John, N. B., and return.

Wind Signals of the U. S. Signal Service are shown from a building near the Custom House. The signals show well to the shipping in Friar Roads.

Marine Hospital.—Relief is furnished under the provisions of the regulations for the Marine Hospital Service as to third-class stations. See Appendix IV.

COBSCOOK BAY,

making in to the westward of Moose Island, is a large, irregular bay with several arms. It is approached through the channel leading between Moose Island on the north and Seward's Neck on the south. This bay is full of rocks and has dangerous currents, which require local knowledge to keep a vessel in the channels. The towns of **Pembroke, Dennysville,** and **Whiting** are situated on its shores. Strangers seldom enter Cobscook Bay, and then only with a pilot, generally taken at Eastport. Good anchorage is found in the coves that are not too full of rocks, but everywhere in the channel the currents are too strong and the bottom too rocky for anchorage. Ice obstructs navigation during the winter.

PASSAMAQUODDY BAY

is a large, irregular bay indenting the shore of New Brunswick east of the mouth of the St. Croix River. The principal entrance to the bay is between Deer Island on the east and Moose Island (Eastport) on the west, which is also known as the **Western Passage of St. Croix River.** This passage has good water and is comparatively free from dangers; it is 4 miles long from Eastport to the town of **Perry,** where it joins Passamaquoddy Bay. The bay between Perry and St. Andrew's Island is free from dangers; the western and northern shores of Deer Island are bold-to, except in the coves.

Four miles north of Eastport is **Gleason's Cove,** an indentation on the western shore of the entrance of Passamaquoddy Bay. It is a fair anchorage in westerly winds. Emptying into it is the small stream known as Little River, leading up to the village of Perry, a place of small commercial importance.

The Canadian town and port of **St. Andrew,** near the eastern point at entrance to the St. Croix River, is one of the most important on the New Brunswick side of these waters. It has some commerce, but the anchorage which is between it and St. Andrew's Island is only available for light-draught vessels. A light-house marks the entrance to the inner harbor. St. Andrew is the terminus of the N. B. & Canada Railroad.

The village of **Robbinston,** Maine, opposite St. Andrew, on the west shore of the entrance to St. Croix River, is of little importance.

ST. CROIX RIVER

empties into the western end of Passamaquoddy Bay from the northward; for a distance of 5¼ miles, from Robbinston to Devil's Head, its least width is ⅜ mile. At Devil's Head the river makes a sharp bend to the westward and narrows rapidly to **The Ledge,** a village on the N. B. side, 2 miles above. In several places above this point the river narrows to a width of 300 yards and can be navigated by sailing vessels only at high water.

The depth of water in the river below Devil's Head remains stationary, but above this the sawdust from lumber mills farther up the river is gradually filling up the channel and forming flats which prevent navigation above The Ledge except at high water. Vessels can anchor and lie afloat below The Ledge, but above this, and at Calais they lie aground at low water. There are comparatively few dangers in this river; the currents are strong (see

remarks about currents), and by taking advantage of them the navigation of the river up to The Ledge is simple; above this a pilot or tow-boat should be employed. Vessels may anchor anywhere in the river where the currents are not too strong or the water too deep.

Red Beach is a small village of no commercial importance, on the west bank of the river abreast of Dochet Island (marked by **St. Croix River light-house**, see table of lights, p. 16); the latter lies nearly in the middle of the river and is ⅝ mile from the eastern shore; the best water is to the eastward of the island.

The Ledge is a small village on the north shore of the river about 2 miles above Devil's Head. Here are two small, square, white light-houses, one on Spruce Point below, the other on Mark Point above The Ledge.

The city of **Calais** on the south bank of the river, about 11 miles above its mouth and 22¼ miles above Eastport, is of considerable commercial importance and has a large lumber trade; it is a terminus of the St. Croix and Penobscot Railroad. All classes of vessels up to 19 feet draught come here to load lumber, coming up the river at high water and lying aground while loading. There is only 4 feet at low water in the channel for some distance below the city, and this depth is said to be decreasing owing to the sawdust which comes down the river from the lumber mills above. The usual draught of vessels going to Calais is about 12 feet.

Pilots.—Strangers should take a pilot or tow-boat to go above The Ledge; pilots are found here ready to take vessels up at high water.

Supplies.—Anthracite and bituminous coal can be had alongside the wharves at Calais. Water is taken from the river at low water. Provisions and ship chandler's stores can be obtained.

Repairs to vessels' hulls can be made at Calais; there is one dry-dock 150 feet long and 28 feet broad and one marine railway of about the same dimensions.

St. Stephen, on the north bank of the river opposite Calais, is connected with the latter by a bridge just above the wharves. It has considerable trade in lumber and is the terminus of the St. Stephen's branch, which connects with the New Brunswick and Canada Railroad.

Ice.—During January, February, and March the St. Croix River is obstructed by ice and not navigable above Robbinston.

TIDES.—ST. CROIX RIVER AND APPROACHES.

It is high water at Eastport 11 hours 8 minutes after the moon's southing (meridian passage).

	Time of H. W. before or after time of H. W. at Eastport.	Average rise of tides.
	h. m.	Feet.
West Quoddy Head	0 13 before.	15.2
Lubec	0 04 "	18.3
Cobscook Bay (Deep Cove)	0 12 after.	19.4
Gleason's Cove	0 06 "	18.4
Robbinston	0 10 "	19.8
St. Croix River light-house	0 17 "	19.9
The Ledge	0 22 "	20.0
Calais	0 29 "	20.3

Complete tidal data for the principal ports is given in the table on page 15.

Note.—Southeasterly gales sometimes cause very high tides at Eastport.

TIDAL CURRENTS.—ST. CROIX RIVER AND APPROACHES.

In the Grand Manan Channel the flood sets in a general **NE.** direction, and at strength attains a velocity of about 3 knots. The ebb sets in a southwesterly direction with a velocity at strength of about 3 knots.

Approaching the entrance to Quoddy Roads, if less than 2 miles from the northern shore, the set of the flood is more to the northward, and about 1 mile to the southeastward of West Quoddy Head, the flood sets directly into the Roads. For a distance of ½ mile to the southeastward of West Quoddy Head the currents are dangerous on account of swirls and eddies, which are apt to draw a vessel, in a light breeze, on to Sail Rock.

Along the eastern side of Campobello Island the flood sets in a northeasterly direction following the trend of the shore, the ebb setting in a contrary direction.

Along the northwestern side of Campobello Island, 1 mile north of East Quoddy Head, the flood sets strong to the westward on to the islands lying in the passage to the westward of Campobello Island. The direction of the flood then changes more to the southward, following the general direction of the passage until nearly to Eastport, where the set is more westerly, toward the passage between Deer and Moose islands and toward the entrance to Cobscook Bay. The ebb generally sets in a reverse direction.

Through Lubec Narrows the flood sets to the northward, following the general direction of the dredged channel; to the southward of the Narrows it has a velocity of about 4 knots at strength, but in the Narrows it attains a velocity of about 6 knots during spring tides. The ebb sets to the southward, following the general direction of

the channel, and in the Narrows has a velocity of about 8 knots during spring tides. Below the Narrows its velocity is about 4 knots, and the set is in the general direction of the channel. The currents at strength form dangerous eddies on both sides of the channel in the Narrows; these are avoided by keeping in mid-channel. It is slack water in the Narrows about 1 hour before high and 1½ hours before low waters; the duration of slack is short, from 5 to 15 minutes. With a strong fair wind small sailing vessels can pass through the Narrows with an adverse current at any time after the current has been running 3 hours.

To the northward of the Narrows the first of the flood current sets along the west shore of Campobello Island to the eastward of Pope's Folly; it afterwards sets more to the westward, south of Pope's Folly, and across the entrance of Johnson's Bay, meeting the flood from Friar Roads to the westward of Treat Island and both setting into Cobscook Bay.

In the Western Passage of St. Croix River.—The flood sets to the northward into the passage, and off Deer Point, abreast Dog Island, it forms whirlpools and eddies which are dangerous and have been known to draw down boats of about 12 tons. The whirlpools and eddies are strongest 2 to 3 hours before high water and during spring tides; the flood then attains a velocity of 6 to 7 knots. The least disturbance is usually about 250 to 275 yards to the northward of Dog Island, where there is a comparatively narrow direct current known locally as "straight water," which can be readily followed between the whirlpools and eddies on the Deer Island side and the eddies on the Eastport side of the passage. The ebb sets to the southward, but does not attain the velocity of the flood.

Above Deer Point the flood sets to the northward with decreasing velocity and follows the general direction of the channel with strong counter currents and eddies close to the shore where the conformation of the land is favorable; it continues ½ to ¾ hour after the time of high water. The ebb sets to the southward with reduced velocity and disturbance off Deer Point, and the inshore reverse currents are less marked than on the flood; it continues ¾ to 1 hour after the time of low water.

St. Croix River above St. Andrew's Island.—The flood sets to the northward with counter currents inshore on both sides where the conformation of the land is favorable for them. The ebb sets to the southward with less marked counter currents.

Cobscook Bay and Tributaries.—The tidal currents follow the general direction of the channels, but in the coves there are strong reverse eddy currents, and heavy overfalls are formed over the submerged rocks and ledges. The velocity is estimated at 5 to 8 knots, and some of the buoys are towed under when the currents are at strength.

Complete observations to determine the set and velocity of currents in these waters have never been taken. The above remarks include extracts from the notes and observations taken by Lieut. F. H. Crosby, U. S. N.; Assistant Coast and Geodetic Survey, while engaged in a hydrographic survey of St. Croix River and Cobscook Bay in 1887-'88; also the results of observations by the U. S. Engineers in Lubec Narrows in 1878, and the notes of a Coast Pilot party on the ground in 1887 and 1890.

SAILING DIRECTIONS, EASTPORT HARBOR.

The directions in Section 1 are for the entrance north of Campobello Island and for vessels of any draught. Those in Section 1 A are for the southern entrance by Lubec Narrows. Vessels of 19 feet draught may enter this way, but those drawing over 12 feet should take a pilot.

The tidal currents in the dredged channel and Lubec Narrows have great velocity, and vessels desiring to pass through from Quoddy Roads should do so on the last of the flood.

Vessels bound through the narrows from Eastport usually pass through at high water slack, which occurs about 1 hour before high water. See also "Tidal Currents," under general description preceding.

1. ***Approaching and Entering.—By the Passage to the Northward of Campobello Island.***—With West Quoddy Head light bearing **W.**, distant 2¼ miles, steer **NE.** by **N.** about 7 miles. When Head Harbor light bears about **NW.** ½ **N.**, change course to **N NW.** ½ **W.** so as to leave this light at least ¼ mile on the port hand; when it bears **S.**, distant about ¼ mile, steer **W SW.** ½ **W.** a little over 1½ miles. When the northern end of Green Island bears **NW.** by **W.** steer about **SW.** ¾ **W.**, heading so as to pass about ¼ mile to the eastward of the city of Eastport. Stand over toward the wharves of the city.

Or, if desiring to anchor in Broad Cove, continue the **SW.** ¾ **W.** course, leaving Buckman's Ledge buoy (spar, red, No. 2), about 100 yards on the starboard hand; when past this buoy bear to the westward so as to leave Estes Head at least 150 yards on the starboard hand. When Broad Cove is well open steer about **N.** by **W.** ¾ **W.**, giving the eastern shore a berth of about 250 yards, and anchor in 4 to 8 fathoms water, soft bottom, when inside Shackford Head, the western point at the entrance.

If desiring to anchor in Friar Bay.—When abreast the wharves at Eastport steer about **S.** and anchor in the bight in 5 to 11 fathoms water, soft bottom.

If desiring to anchor in Johnson's Bay.—When abreast the wharves at Eastport, steer about **S SW. ¾ W.**, heading between Treat Island and Friar's Head (Pope's Folly, a small island, should be ahead). Pass about midway between Pope's Folly and Dudley Island, the island to the northwestward, and steer about **SW.** by **W. ¾ W.** Anchor in 5 to 7 fathoms water, soft bottom, a little to the southward of a line between Rodger's Island and Mulholland Point, and **NW.** from the town of Lubec.

Remarks.—On the **NE.** by **N.** course the shores of Campobello Island, high and bold, will be left about 1½ to 2 miles on the port hand. The tidal currents generally follow the trend of the shore. All dangers will be avoided by giving the eastern shore of Campobello Island a berth of ½ mile.

On the **W SW. ½ W.** course the shore of Campobello Island can be approached as close as 100 yards; Casco Island, Green Island, Sandy Ledge, and Pope Island will be seen on the starboard bow in the order named, and can be approached to 200 yards on their southern sides except Pope Island (see dangers). On the **SW. ¾ W.** course **Indian Island**, a large island, and the city of Eastport will be on the starboard bow. **Thrumbcap** and **Cherry** islands, two small, high, wooded islands off the southeastern end of Indian Island, will be left on the starboard hand, and when nearly up to these islands **De Lute Harbor** entrance will be open on the port beam. After passing Cherry Island the passage between Deer and Moose islands (entrance to Passamaquoddy Bay) will be opened to the northwestward.

When rounding the southern end of Moose Island to enter Broad Cove, **Treat Island**, large, high, and partly wooded, will be left on the port hand. The entrance to Cobscook Bay, between Moose Island and Seward's Neck, will be opened to the northwestward.

Standing into Broad Cove on the **N.** by **W. ¾ W.** course the eastern edge of Treat Island will be astern, and, at low water, the rocks and ledges off Shackford Head and the flats in the head of Broad Cove will show out of water.

Standing down for an anchorage in Johnson's Bay the passage to the eastward of Treat Island and between Dudley Island and Pope's Folly is free from dangers; a good rule is to give the islands a berth of about 200 yards.

Dangers.—**Black Rock** is the name of two small, bare rocks about ⅞ mile **NW. ¾ W.** from Head Harbor light-house; it should be given a berth of not less than 150 yards.

There is a spot with 27 feet over it lying a little over ¼ mile **SE. ½ E.** from Green Island. Vessels usually follow along the shore of Campobello Island, which can be approached as close as 100 yards, passing to the eastward of this spot.

Pope's Shoal is a small shoal with 10 feet over it lying about 350 yards **SE.** from Pope Island; the sailing line passes well to the eastward of this shoal.

Margie's Rock has 14 feet of water over it and is a small rock lying 150 yards from the wharf line of Eastport; 200 yards to the southward of this rock and about 150 yards from the wharf line is **Page's Rock** with 16 feet over it; these rocks are not marked. Union Wharf bears about **N NW.** from Page's Rock.

Buckman's Ledge makes out about 250 yards to the southward from Buckman's Head (southern part of Eastport). It is marked at its southern edge by a buoy (spar, red, No. 2). †

Shackford's Ledge is a cluster of rocks, many of them showing bare at low water, making off nearly 400 yards to the southeastward and southward from Shackford Head. At the southern edge of the ledge is a buoy (spar, red, No. 4). †

A **small rock**, showing bare at extreme low tides, lies about 200 yards north of the northern end of Treat Island.

There are several spots with 17 and 17½ feet over them in the middle of Johnson's Bay; these spots can be avoided by keeping a little to the eastward of the middle of the entrance when standing in for an anchorage.

1 A. ***Approaching and Entering.—From the Southward through Quoddy Roads.***—With Little River light-house bearing **NW.**, distant about 1½ miles, steer **NE.** by **E. ¾ E.** about 14 miles. West Quoddy Head should then be abaft the port beam bearing **NW.**, distant nearly 1 mile. Then steer about **N.** by **W. ¼ W.** so as to pass about ½ mile to the eastward of the light-house. When in the middle of the entrance to Quoddy Roads and the light-house bears about **SW. ¾ W.**, steer **NW.** by **W. ¼ W.** If the wind and tide are not favorable, anchor in 3½ to 4 fathoms water, soft bottom, to the southward of the Lower Middle Ground buoy (spar, red, No. 2).

Or, if bound through the Narrows, pass about 200 yards to the southward of Lower Middle Ground buoy (spar, red, No. 2) and steer about **N.** by **W.**, for the light-house; leave the buoy about 100 yards on the starboard hand, and keep Western Bar beacon a little on the port bow. Leave South End of Dredged Channel buoy (spar, black, No. 1) close on the port hand and steer about **N. ½ W.** so as to leave Lower buoy (nun, red, No. 4) on the starboard hand, and the light-house and West Side of Dredged Channel buoy (spar, black, No. 3) on the port hand. From black spar buoy No. 3 the course is about **NE.** by **N.** for Cranberry Point buoy (spar, red, No. 6), which is left on the starboard hand; from this buoy steer a little more to the northward so as to leave The Gin Bottle

† This buoy is removed in winter on account of ice.

buoy (can, black, No. 5) on the port hand. From this buoy steer about **N.** by **W.** ½ **W.** so as to pass about 100 yards to the eastward of Leadurny Point; from this point steer about **N.**, heading for Pope's Folly, and pass through the Narrows on this course. Leave upper buoy (spar, black, No. 7) on the port hand and then:

If bound to Johnson's Bay, shape the course about **W.** by **N.** for ½ mile and anchor in 7 fathoms just inside of a line from Mulholland Point to Rodger's Island.

If bound to Eastport stand to the westward until Pope's Folly can be left on the starboard hand on a **NE.** course and Dudley and Treat islands on the port hand. Haul up for the city after Treat Island is abeam.

If bound to Broad Cove, proceed as to Eastport, until the north end of Treat Island is abeam, then change course to **NW.** ½ **N.** When up with Estes' Head proceed as when entering from the eastward. Or, stand to the westward, passing south of Pope's Folly and Dudley islands, then steer about **N.** by **W.** so as to leave Dudley Island, Gull Rock, and Burial Island about 250 yards on the starboard hand; when abreast Burial Island steer about **N.** by **E.**, heading fair into Broad Cove, slightly favoring the eastern shore, and anchor in 4 to 8 fathoms water when inside Shackford Head, the point on the western side of the entrance.

Remarks.—On the **NE.** by **E.** ¾ **E.** course the shore will not be approached closer than 1 mile until up to West Quoddy Head. When nearing the head allowance must be made for the tidal currents which set in and out of Quoddy Roads with great velocity; just to southward and eastward of Sail Rock eddies and whirlpools form during the strength of the tide. The **N.** by **W.** ¼ **W.** course leads directly for **Duck Islands**, a group of small islands and ledges about 1⅜ miles **N.** from West Quoddy Head. On the **NW.** by **W.** ¼ **W.** course Lower Middle Ground buoy (spar, red, No. 2) will be on the starboard bow; the light-house and Lubec Narrows will be seen to the northward.

Standing from Quoddy Roads and through the Narrows the light-house and buoys are the principal guides and should be closely followed. The channel is narrow and leads between rocks and shoals, and the tidal currents run with great velocity in the Narrows, forming eddies and swirls on both sides of the channel (see current notes, page 29). Fish weirs are located to the westward of the channel between Western Bar Beacon and Leadurny Point. Lubec Channel light-house should be left about 50 yards on the port hand. **Pope's Folly** is a small island, covered with trees, to the northward of the Narrows; to the northwestward of it is **Dudley Island**, and to the northward of the latter is **Treat Island**, the largest island in this part of Friar Roads. All these islands have rocky coast lines. Pope's Folly and Dudley Island are wooded, and Treat Island is partly wooded. Between Dudley and Treat islands there is a shoal which is usually covered with fish weirs. The channels on the eastern and western sides of Dudley and Treat islands have from 6½ to 15 fathoms of water. The islands should be given a berth of over 200 yards on their eastern side, and the bare rocks to the westward of Treat Island should not be approached closer than 175 yards from the westward.

Dangers.—The shore between Little River and West Quoddy Head can be approached as close as ½ mile.

Sail Rock and **Little Sail Rock** are two of a group of ledges which lie nearly ¼ mile in a **S SE.** ½ **E.** direction from West Quoddy Head light. These two rocks are bare and have a depth of 8 fathoms between them, but there are several submerged rocks, and the strong tidal currents necessitate giving them a wide berth.

Round Rock and **Liberty Point Ledge** lie a little over ¼ mile to the westward of **Liberty Point**, the southern point of Campobello Island and the eastern point at entrance to Quoddy Roads. These rocks are not marked, but show bare at all stages of the tide; vessels should pass at least 300 yards to the southward of the southernmost rock.

Wormell's Ledges lie along the southern shore of Quoddy Roads to the westward of West Quoddy Head; they have from 1 to 5 feet of water over them and are mostly bare at spring tides; they are not marked. The western edge of these ledges is a little over ¼ mile from the shore and bears about **S SW.** from Lower Middle Ground buoy (spar, red, No. 2).

The western part of Quoddy Roads is full of shoals which extend out ¾ mile from the shore. On the northern side of Quoddy Roads are extensive shoals which extend out a little over ⅝ mile. About ⅜ mile **NW.** from Liberty Point Ledge is a spot with 13 feet of water over it.

Lower Middle Ground, with 2 feet of water over it at low water, is a large shoal extending **N NW.** and **S SE.** in the middle of Quoddy Roads. The southern point is about ½ mile **N NW.** from the northeastern point of West Quoddy Head. On its western side the shoal is marked by a buoy (spar, red, No. 2).

Shoals make out from both shores above the Lower Middle Ground to the edge of the channel, and, in many places, fish weirs extend out from the shores. The **Duck Islands**, several small islands off the shore of Campobello Island, and bearing about **E.** from Western Bar Beacon, have ledges extending to the southward about 400 yards, which are dry at low water, and show at all stages of the tide.

Western Bar is the extensive flat, mostly bare at low water, which makes out from the western shore below Leadurny Point; the northern part of this shoal is sometimes called **Lubec Flats.** The eastern edge of Western Bar is marked by **Lubec Channel light-house** (see table, page 16), Western Bar Beacon, black spar-buoy No. 3, and black can-buoy No. 5.

The **shoals** on the eastern side of the channel are marked on their western edge by two buoys: Lower buoy (nun, red, No. 4), and Cranberry Point buoy (spar, red, No. 6).

There are **shoals** and **ledges** on both sides of the channel in the Narrows but they are not marked. Making off

from the northeastern point of Lubec and opposite the light-house on Mulholland Point is a dangerous ledge, upon the shore end of which is built a jetty, which is 259 feet long and shows out of water; near the northern end of this ledge is a buoy (spar, black, No. 7).

Paddy's Ledge and **Gull Rock** are a cluster of small rocks showing out of water at all stages of the tide, lying north of Dudley Island and west of Treat Island. All danger is avoided by passing 150 yards to the westward of them.

A small rock, bare at extreme low tides, lies 200 yards north of the northern end of Treat Island.

Burial Island is a small island lying about 350 yards northwestward from Treat Island; shoals extend 125 yards to the westward of this island and to the eastward to Treat Island.

About 100 yards north of the eastern end of Burial Island is a small bare rock.

Rodger's Island, on the west side of the channel, opposite Dudley Island, should not be approached closer than 300 yards.

Major Island, a small round island lying about ¼ mile to the northward of Rodger's Island, may be approached close to on its eastern side.

There are several **unmarked rocks** on the western side of the channel to the northward of Major Island, and about 400 yards from the eastern shore of Seward's Neck.

SAILING DIRECTIONS, ST. CROIX RIVER.

Sailing vessels should not attempt to enter the river except with a favorable tide or a strong fair wind, as no headway can be made against the strong tidal currents. The directions are good for vessels of the heaviest draught as far as Devil's Head; above this some local knowledge is necessary to keep in the best water. Vessels of 8 feet draught can pass up to The Ledge, at low water, by following the directions.

Current Note.— Before entering this passage consult the current note, "In the Western passage of St. Croix River," page 30.

1. ***From Eastport to the Entrance.***— Having followed the directions for Eastport Harbor, pages 30–32, give the shore of Moose Island (Eastport) a berth of at least 400 yards and stand to the northward, following the trend of the shore. Pass about 250 yards to the northeastward of Dog Island, and when it bears **SW.** make good the course **N.** by **W.**, so as to pass about 350 yards to the westward of Clam Cove Head. Continue the **N.** by **W.** course past the head and then steer a little more northerly, following the general trend of the western shore, giving it a berth of at least 400 yards. Stand into the entrance, favoring the western shore, and be guided by the directions in Section 2, following.

Remarks.—When standing to the northward to enter the passage into Passamaquoddy Bay between Deer and Moose islands, **Indian Island**, large, partly wooded, with several wharves and houses near its southern end, will be left on the starboard hand. **Dog Island**, a small rocky island with grassy top, close to the northeastern point of Eastport, should be left about 300 yards on the port hand. **Deer Point**, the southern point of Deer Island, is nearly ½ mile **NE.** from Dog Island.

On the **N.** by **W.** course **Johnson's Cove**, a broad bight in the western shore 1 mile above Dog Island, will be passed; this is a good anchorage not affected by the tidal currents. **Kendall Head** is the headland to the northward of Johnson's Cove and to the southward of the northern entrance to Cobscook Bay, which is obstructed by a bridge connecting Moose Island with the mainland; Carlow's Island lies in this entrance. **Cummins Cove** is a small bight in the eastern shore opposite Kendall Head. **Clam Cove**, or **Fair Haven**, in the eastern shore, about 1¾ miles above Kendall Head, has good anchorage in 3 to 10 fathoms of water; **Clam Cove Head** is the northern point at entrance to the cove.

Gleason's Cove is a bight in the western shore, about 2½ miles above Kendall Head. There is a good anchorage in westerly winds at the mouth of the cove. Above Gleason's Cove the directions lead through the western part of Passamaquoddy Bay. St. Andrew's Island and Port St. Andrew will be on the starboard bow, and the church spire and houses of the village of Robbinston will be nearly ahead. The land along the western shore slopes gradually, and is partly covered with a low growth of trees. When up to St. Andrew's Island, **Lewis Cove**, a shallow cove in the western shore, and the village of **North Perry** will be passed. Just below Liberty Point is **Mill Cove**, a shallow cove, at the head of which is the village of **South Robbinston**. St. Croix River light will be seen ahead in the middle of the river. The beacons marking the northern entrance into Port St. Andrew should be left well on the starboard hand when standing for the entrance of the river.

Dangers.—**Clarke Ledge**, showing bare at half tide, lies about 225 yards from the wharf line of the northern part of Eastport, and about 500 yards **SE.** by **S.** from Dog Island; this ledge can be avoided by giving the western shore a berth of at least 300 yards.

A ledge, with 7 feet near its end, makes out about 100 yards in a northeasterly direction from Dog Island.

Frost's Ledge, showing bare in places near low water, lies about 450 yards **E.** from **Frost Island**, the small island at the southern point at entrance to Gleason's Cove; there is a channel with 10 feet of water between the ledge and

island. Off the eastern edge of the ledge is a buoy (spar, black, No. 1); in entering Gleason's Cove this buoy should be left well on the port hand.

The western shore above Gleason's Cove can be approached in many places as close as 200 yards, but it is advisable to give the shore a berth of at least 300 yards, keeping out of the coves, until up to Mill Cove, when it should be given a berth of 400 yards.

Shoals make out to the southeastward from St. Andrew's Island, but are marked at their southern and eastern ends by two buoys. The western shore of St. Andrew's Island should be given a berth of at least 250 yards, and when passing the North West Beacon (about 700 yards **NW.** ½ **W.** from the northern point of the island) give it a berth of 300 yards.

2. ***From the Entrance (Liberty Point) to The Ledge.***—Having followed the directions in Section 1, preceding, enter the river so as to pass about midway between Liberty Point on the west and Joe's Point on the east; steer about **N.**, so as to be well over toward the eastern shore when a little over 1 mile below St. Croix River light. Follow along the eastern shore, giving it a berth of from 250 to 700 yards, and keeping out of the bights. Give the eastern side of Dochet Island a berth of at least 450 yards.

When St. Croix River light bears about **SW.** work over to the westward gradually, and follow a mid-river course, heading for the eastern side of Oak Point. When this point is about ⅜ mile distant ahead and the river is well opened to the westward, shape the course about **NW.** by **W.** so as to pass midway between Bluff Head on the starboard hand and Middle Ground buoy (spar, black, No. 3) on the port. Continue up the river, passing about 200 yards south of Spruce Point light-house. After passing this light-house keep in the middle of the river until a **N NW.** ½ **W.** course can be steered, which will lead about 50 yards to the eastward of Elliott Flats buoy (spar, black, No. 5). When a short distance past this buoy, follow the northern shore and anchor off the wharves to the northeastward of the three black wooden piers.

The best anchorage is close to the ruined piers on the northern shore, and vessels should anchor so as to swing clear of them when the tide turns.

Remarks.—On the **N.** course, Dochet Island and the light-house will be on the port bow. When about 1¼ miles below this island care should be taken not to be set over on to the Middle Ground, which lies fair in the middle of the river, 1 mile below the island, and is not marked. **Greenlaw's Cove**, a shallow bight, makes into the eastern shore abreast the Middle Ground. **Johnson's Cove** is the broad, shallow bight in the eastern shore abreast Dochet Island; opposite, on the western shore, is the village of Red Beach.

Devil's Head is the high hill, with bluff faces toward the river, which shows conspicuously when abreast of Robbinston. The river makes a sharp bend to the westward above Devil's Head. **Oak Point** is the low point above Devil's Head, separating St. Croix River from Oak Bay. Emptying into the eastern side of the entrance of Oak Bay is Warwig Creek. **Raven's Head** or **Bluff Head**, on the north shore of St. Croix River ⅜ mile above Oak Point, has bluff perpendicular wooded faces; **Spruce Point light-house**, a small, square, white structure, is about ½ mile above Raven's Head, and should be nearly ahead on the **NW.** by **W.** course.

The Ledge is about ¾ mile above Spruce Point light. At the upper end of the village is **Mark Point light-house**, a small, square, white structure. On the south side of the channel, about **SE.** from Mark Point light, are three wooden piers, above which vessels should not go without a pilot.

Dangers.—**Middle Ground** has 4 to 8 feet of water over it, is nearly ⅜ mile long, and lies in the middle of the river, the lower end being 1 mile **S.** by **E.** from Dochet Island. This shoal is not marked, but may be avoided by keeping well over toward the eastern shore of the river.

Little Dochet Island is a small island lying between the Middle Ground and the western shore; a ledge with 2 feet of water at its end makes out 200 yards south from the island.

Half Tide Ledge is the southernmost of the extensive ledges which surround Dochet Island. It shows bare in spots at half tide, and its southwestern point is marked by a buoy (spar, red, No. 2).

An unmarked **ledge** with 2 to 5 feet of water over it makes out 300 yards to the eastward from Dochet Island abreast the light-house. A ledge extending a little over 250 yards north from Dochet Island shows partly bare at half tide; just to the northward of this ledge is a buoy (spar, red, No. 4).

Sandy Point Shoal, extending 125 yards out from Sandy Point, is bare at low water. A short distance above Sandy Point a shoal, with 19 feet over it, makes out 350 yards from the eastern shore; this shoal is not marked, but is avoided by keeping in mid stream.

Shoals make to the southward from Oak Point for a distance of 400 yards; these shoals have a depth of 13 feet near the end and are marked by a buoy placed near the southwestern edge.

Shoals with 7 to 12 feet of water over them make out from the south shore of the river above Devil's Head, leaving the channel, between the 18-foot curves, about 200 yards wide off Bluff Head. The northern edge of these shoals is marked by a buoy (spar, black, No. 3).

Opposite The Ledge, making off from the south shore of the river, are **large flats** which run dry at low water; they are known as Elliott Flats, and are marked at their northeastern edge by a buoy (spar, black, No. 5).

From West Quoddy Head to Little River, about 14 miles, the coast trends about **SW.** by **W.**, and is for the most part high, rocky, covered with trees, and with precipitous faces to seaward. It is quite bold-to, and the only outlying dangers are: **Morton's Ledge**, with 6 feet of water over it, lying about ⅜ mile off-shore, 2¼ miles **W SW.** from West Quoddy Head light-house, and marked by Morton's Ledge buoy (nun, red, No. 2); and a 13-foot spot lying ¼ mile **SW.** ½ **S.** from Long Point.

The shore line is broken by the following unimportant coves, named from the eastward with their distances in miles from West Quoddy Head light-house: Carrying Place Cove, 1¼; Wallace's Cove, 1¾; Hamilton's Cove, 3; Julia's Cove, 3¼; Boot Cove, 4; Bailey's Mistake, 5½; Haycock Harbor, 6¼; Sandy Cove, 6½; Moose Cove, 7¾; Bog Brook, 9½; Black Point Cove, 11¾; Long Point Cove, 12¼; and Schooner Brook, 13¾. The largest of these are Bailey's Mistake and Moose Cove. When passing along outside, both of these will appear to be good open anchorages, but neither has good holding ground, nor can they be used as a harbor of refuge. Both have ledges, not buoyed, at their entrances, and afford shelter only from northerly winds. **Bailey's Ledge** lies off the western side of the entrance to Bailey's Mistake, and **Eastern Head Ledges** off the eastern side of the entrance to Moose Cove; both are dangerous and are unmarked except at low water.

LITTLE RIVER (CUTLER).†

This harbor is 14 miles to the westward of West Quoddy Head and about 9½ miles to the eastward of Libby Islands; it is marked by **Little River light** (see table, page 16), which is situated at the western side of the entrance on Little River Island. It is an excellent harbor of refuge, sheltered from all winds, has 12 to 30 feet of water with good holding ground, and is used by all classes of coasters and fishermen. The channel leads to the northward of the light-house and has a depth of 6 fathoms. The harbor can be entered without the assistance of a pilot by closely following the directions. The usual anchorage is about ½ mile long and ¼ mile wide, just inside of Little River Island, but small vessels sometimes anchor well up toward the head of the harbor and lie aground at low water.

Cutler, the village at the head of the harbor, is of no commercial importance. There are several hotels and summer residences on the north shore and a church with tall spire is prominent at the head of the harbor. It is a rendezvous for pilots for ports to the eastward and the British Provinces. Pilots can usually be found here to take vessels to the westward.

For tidal data see table, page 15.

Ice.—The harbor is never obstructed by ice so as to prevent vessels entering.

SAILING DIRECTIONS, LITTLE RIVER.

1. ***From the Eastward.***—Bring Little River light to bear **W.** and steer for it, keeping it on that bearing until about ¼ mile from the light-house; then steer about **NW.** by **W.** ½ **W.** so as to pass about 250 yards to the northward of it. Leave Little River Ledge buoy (spar, red, No. 2) on the starboard hand. Anchor in 12 to 30 feet of water anywhere to the northwestward of the island, but not closer than 150 yards from the shore.

Remarks.—The shore between West Quoddy Head and Little River entrance may be approached anywhere to ½ mile, and closer in many places. The white pyramidal fog-bell structure to the southward of Little River light is the most conspicuous feature to recognize the entrance.

The eastern and northern shores of Little River Island should not be approached closer than 100 yards. To the westward of the island there is a passage with 9 feet of water, but it is narrow and rocky, and strangers should not attempt to use it.

Dangers.—There are no outlying dangers in coming along shore from the eastward until near Long Point; a little over ¼ mile **SW.** ½ **S.** from this point there is a shoal spot with 13 feet over it and 11 fathoms to the northward.

Little River Ledge, showing bare in places at low water, and marked by Little River Ledge buoy (spar, red, No. 2), makes out from the northern shore of the entrance.

1 A. ***From the Westward.***—In approaching from the westward the entrance may be recognized by the large white spots painted on the rocky faces of Little River Head. Give the shore to the westward of the entrance a berth of ½ mile. When Little River light is opened bring it to bear **NW.** and stand in. Pass from 200 to 250 yards to the eastward of it, then haul to the westward and follow the directions in Section 1.

See Remarks and Dangers under Section 1.

LITTLE MACHIAS BAY.†

Little Machias Bay, about 2 miles to the westward of Little River (Cutler Harbor), is not used for an anchorage as it is exposed to southerly and southeasterly winds, and is close to Little River and Machias Bay, both excellent

† Shown on Coast and Geodetic Survey charts: **101a** and **102**, scale of each $\frac{1}{80,000}$, price of each, $0.50.

anchorages. The entrance to the bay lies between **Deer Island** on the east and **Cape Wash** on the west, and is about 1¼ miles in width. The shores are mostly barren and rocky; the eastern and northern are dotted with houses but the western shore is very thinly settled. The best anchorage is on the western side of the bay in from 2 to 5 fathoms of water, about ½ mile above Dennison's Point; above this the bay is much obstructed by rocky ledges and shoals which extend to its northern end.

To the westward of Little Machias Bay is **Cross Island Narrows**, a narrow passage into Machias Bay, separating Cross Island from the mainland; it is much obstructed by rocks and shoals, and, although some of the dangers are marked, strangers should not attempt to use it.

Old Man, a small but prominent rocky isle lying about 1 mile **SE. ½ S.** from Cape Wash, is a good landmark passing along the coast and may be approached to as close as ¼ mile on all sides.

Deer Island is a small rocky isle on the eastern side of the entrance, about 150 yards from the mainland and ⅝ mile **SE.** from Dennison's Point. **Cape Wash Island**, small and rocky, lies **SE.** from Cape Wash and is separated from it by a channel about 200 yards wide.

The **Black Ledges** are rocky spots, bare at all stages of the tide, lying midway between Deer and Cape Wash islands; there is good water close-to on both sides.

As Little Machias Bay is so little used as an anchorage no sailing directions are given.

MACHIAS BAY AND RIVER. †

This bay is easily entered, and affords well sheltered anchorage for the largest vessels; it is about 6 miles long in a **N NE.** and **S SW.** direction, and the main entrance between Cross Island on the east and Stone Island on the west is a little over 2 miles wide. The dangers are well marked and the channel is straight, so that any vessel can enter with the assistance of the chart or by close attention to the directions. The principal guide to the entrance is **Libby Island light** (see table of lights, page 16), which is 9 miles to the westward of Little River light and 9 miles **E NE. ¼ E.** from Moose Peak light-house. **Avery's Rock light** (see table of lights, page 16), is 5¼ miles **N NE. ¾ E.** from Libby Island light-house, and the guide for vessels bound up the bay.

The **anchorage** in Machias Bay is more easily made in thick weather than any other in this vicinity. Vessels standing along the coast will usually hear the fog-signal on Libby Island a distance of 3 miles; and when standing up the bay the bell on Avery's Rock should be heard about 1 mile. It should be remembered that the sound from these signals is subject to aberration, but not to so marked a degree as from the signal at Petit Manan.

Machias River empties into the northwestern part of the bay; it has a narrow, winding channel, marked by buoys at the turns, leading through flats which are mostly bare at low water. The least water in the channel up to the town of Machiasport is 20 feet; this depth is said to be decreasing. A little below the town of Machias it shoals to 4 and 5 feet at low water. Machias is at the head of navigation, and about 6½ miles above the mouth of the river. Although the river is buoyed as far as Machiasport it is advisable for strangers to take a pilot or tow-boat.

East Machias River is a narrow, shallow stream emptying into the Machias River from the northward, a short distance above Machiasport.

Cross Island Narrows is a channel leading into Machias Bay, east of Cross Island; this passage, much obstructed by rocks and ledges, should never be attempted by a stranger.

North West Harbor, a bight in the north shore of Cross Island near its western end, has from 4 to 9 fathoms of water, but is little used as an anchorage.

Foster's Channel is a narrow passage, marked by two buoys, leading from Englishman Bay to the western entrance of Machias Bay, between Foster's Island and Ram Island. It is seldom used by any vessels but those acquainted with the locality.

Starboard Cove, on the western side of the bay north of Starboard Island, is an excellent anchorage with 15 to 24 feet of water, and is much frequented by coasting vessels making an anchorage for the night if bound through Moose-a-bec Reach. A bar, dry at low water, connects Starboard Island with the mainland; the anchorage is made by rounding the eastern end of the island.

Howard's Bay, to the northward of Starboard Cove, has the appearance of a good anchorage, but the holding ground is very poor.

Buck's Harbor is a small shallow cove in the west shore of the bay, about west from Yellow Island; a small village is located on the shore of this harbor. Fishermen and small craft are the only vessels that enter for an anchorage.

Larrabee's Cove and **Indian Cove** are two small coves in the west shore of the bay, northwest from Avery's Rock light; these coves are of no importance, but good anchorage for vessels of 8 feet draught will be found on the flats between Salt Island and Bare Island, near their entrances.

Holmes' Bay, a large bight in the northeastern part of Machias Bay and east of Hog Island, is so shallow that it cannot be used as an anchorage.

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† Shown on Coast and Geodetic Survey charts: **101 a** and **102**, scale of each $\frac{1}{80,000}$, price of each $0.50.

Entrance to Machias Bay from the Eastward, Libby Id. Lt. Ho. bearing N. W. ½ W. distant 3 Miles.

Entrance to Machias Bay from the Westward, Libby Id. Lt. Ho. bearing N.E. by N. distant 2¼ Miles.

Entrance to Chandler Bay from the Westward, Mark Id. bearing N. W. by W. ½ W. distant 3 Miles.

Machiasport is on the west bank of the river, about 2¾ miles above its entrance. The steamers of the Portland and Machias line stop here. Vessels of 18 feet draught have been taken up to the town, but the usual draught is 11 feet. There is 6 to 7 feet of water alongside the wharves.

East Machias is a town about 2½ miles above Machiasport on the East Machias River. The deepest draught entering here is 12 feet.

Machias is about 3¾ miles above Machiasport on the Machias River. The deepest draught going to Machias is 14 feet.

The **channels** leading into Machias Bay on the east and west sides of Libby Islands are clear and unobstructed; the eastern, between Cross Island and Libby Islands, is about 1½ miles wide and has a least depth of 15 fathoms; the western, between Libby Islands and Ram Island, is about ¾ mile wide and has a least depth of 21 fathoms. Above the Libby Islands the channel leads straight for Avery's Rock, passing it on either side; the least depth to this point is 8 fathoms. Above the rock the channel leads **N NE.**, passing close to the islands off the western shore; abreast of Round Island it is a little over ½ mile wide with a depth of 5 to 7½ fathoms. Above Round Island the water shoals, and a stranger should anchor.

Anchorages.—The principal anchorages are: Starboard Cove, in 15 to 24 feet of water; and to the northeastward and eastward of Round Island in 4½ to 7 fathoms. Vessels of less than 12 feet draught sometimes anchor 1 mile **N NE. ¾ E.** from Round Island, in 14 to 18 feet, soft bottom. Good anchorage will be found anywhere between Round Island and Avery's Rock, in 5 to 7 fathoms.

Pilots are not necessary for the bay, but a stranger entering to go up the Machias River should take either a pilot or a tow boat. The pilot signal should be made when inside of Libby Islands; if they do not board the vessel in the lower bay they will be sure to do so when abreast Buck's Harbor.

Tow-boats.—Vessels requiring a tug should take one off Round Island. If not found there they will come from Machiasport when ordered.

Supplies.—A limited quantity of anthracite coal can be had at the steamboat wharf at Machiasport. Provisions and ship chandler's stores can be obtained at Machiasport, East Machias, and Machias.

Repairs.—There are shipyards at each of the three towns. At Machiasport there is a marine railway, cradle 110 feet long, 36 feet wide, and capable of hauling out vessels of 400 tons and 10 feet draught. Limited repairs to machinery of steamers can be made at Machias.

Marine Hospital.—Relief is furnished by an Acting Assistant Surgeon of the Marine Hospital Service.

Ice.—In severe winters Machias River is closed to navigation and drift ice will sometimes fill the bay above Avery's Rock. In ordinary winters the bay and river are open to Machiasport.

The **currents** follow the general direction of the channel and are not strong.

Tides.—The mean rise and fall of tides at Starboard Island is 12.5 feet, at Machiasport 13.5 feet, and it is high water at the former place 18 minutes earlier than at the latter. For complete tidal data see table, page 15.

SAILING DIRECTIONS, MACHIAS BAY.

Machias Bay may be entered from the eastward through Cross Island Narrows, but strangers should not attempt it.

1. ***Approaching and Entering.—From the Eastward.***—With Libby Island light on any bearing to the northward of **W.**, steer for it, and when 2 miles from the light shape the course so as to pass about ½ mile to the eastward of the northern end of Libby Islands. Bring Avery's Rock light to bear **N. by E. ½ E.** and steer for it, keeping it on that bearing. Pass it close-to on either hand and head for Round Island. Anchor anywhere between Avery's Rock and Round Island, or just to the northeastward of the latter.

If bound up the Machias River.—Strangers are advised to take a pilot or tow-boat; if without either, the best time to go up the river is at low water when the flats are bare and the edge of the channel fairly well defined.

To make an anchorage in Starboard Cove.—When the northeastern end of Libby Islands bears **W SW.**, distant ½ mile, steer about **NW. by N.**; pass about ¼ mile to the northward of Stone Island and then change the course to the westward so as to pass about the same distance to the northward of Starboard Island. Anchor in 15 to 24 feet of water as soon as the north end of Starboard Island and the south end of Stone Island come in range. The water shoals gradually to the southward toward the bar connecting Starboard Island with the mainland.

Remarks.—There are no dangers in approaching from the eastward. Libby Islands are bold-to and may be approached as close as 300 yards.

On the **N. by E. ¼ E.** course, **Chance's Island** (round, moderately high and thickly wooded, except its western end)

will be on the starboard bow and **Yellow Island** with bare, light-colored rocks, on the port bow. As Avery's Rock is approached, **Round Island** will be seen 1 mile **N.** of it and **Salt Island** just to the westward of Round Island.

On the **NW.** by **N.** course into Starboard Cove, **Stone Island**, rocky, covered with a thick growth of small fir, will be on the port bow. A black iron spindle, with a cage on top, marking Stone Island Ledge, will be seen to the eastward of Stone Island. A black can-buoy lies about ¼ mile **E NE.** from the northern end of Stone Island. As Stone Island is approached, **Starboard Island**, distinguishable by a high, bare, precipitous face, will be opened out to the westward.

Dangers.—**Cross Island Ledge** makes out nearly ½ mile to the westward from the southwest end of Cross Island. A buoy (can, red, No. 2) lies a little distance **S SW.** from this ledge and should be left on the starboard hand in entering the bay.

Sea Shore Ledge, partly bare at low water, is marked by a buoy (spar, black, No. 1), and lies in the western side of the bay, about ½ mile in a southeasterly direction from Howard's Point.

Yellow Island and Chance's Island are quite bold-to on the channel side.

Shoals make out ¼ to ½ mile to the westward from Sprague's Neck, leaving the channel to the eastward of Avery's Rock a little less than ½ mile in width.

1 A. ***Approaching and Entering.*** — ***From the Westward.*** — With Libby Island light on any bearing to the northward of **E.** by **N.** steer for it, and when within 2 miles of the light shape the course so as to pass ½ to ¾ mile to the westward of it. When the light bears **E.**, steer **NE.** until Avery's Rock light bears **N.** by **E.** ½ **E.**, then steer for the latter, keeping it on that bearing, and follow the directions given in Section 1, foregoing.

To make an anchorage in Starboard Cove, proceed as directed above until the northern end of Stone Island bears about **W.**, then change course to **NW.** by **W.** ½ **W.** and pass about ¼ mile to the northward of Stone and Starboard islands; then anchor as directed in Section 1, foregoing.

Or, if wishing to pass between Starboard Island and Stone Island, when Libby Island light bears **E.**, distant ½ to ¾ mile, steer **N NE.** ½ **E.** for the southern end of Stone Island; when about ¼ mile from it and abreast Starboard Island Ledge buoy (spar, red and black horizontal stripes), steer **N.** ½ **E.**, leaving Stone Island about 300 to 400 yards on the starboard hand. When abreast the northern end of Starboard Island haul to the westward and anchor as directed in Section 1, foregoing.

Vessels bound into Starboard Cove may pass about ¼ mile to the eastward of Ram Island and then head **N NE.** ¼ **E.** for the northern end of Starboard Island. Pass about midway between Foster's Island and Starboard Island Ledge buoy, and give the eastern shore of Starboard Island a berth of 350 yards.

Remarks.—The **NE.** course leads about midway between Libby and Stone islands. Chance's Island will be seen a little on the port bow. See Remarks and Dangers under Section 1, foregoing.

Entering Starboard Cove on the **N NE.** ¼ **E.** course Starboard Island Ledge buoy (spar, red and black horizontal stripes) should be left about ¼ mile on the port hand. The southern end of Stone Island is bold-to, but shoals make out about 300 yards on its western side. The northeastern end of Starboard Island is bold-to and may be approached as close as 100 yards.

Ram Island, a low rocky isle with scanty growth of stunted fir trees on its western end, lies 1¼ miles **NW.** ¾ **W.** from Libby Island light-house; it has shoals making out about 200 yards from its eastern edge.

Dangers.—**Starboard Island Ledge**, with five feet over it, and lying ⅝ mile **SW.** ½ **W.** from the southern end of Stone Island, is marked by a buoy (spar, red and black horizontal stripes).

The shoals making out from the southern end of Foster's Island, at the entrance to Foster's Channel, are marked by a buoy (spar, red, No. 2). The eastern side of Foster's Island has shoals making out about 400 yards and should not be approached nearer than ¼ mile.

LITTLE KENNEBEC BAY †

is an anchorage to the westward of Machias Bay and makes to the northward from the eastern part of Englishman Bay; it is of no commercial importance, and is frequented mostly by fishermen. There is good anchorage in 12 to 40 feet of water, soft bottom, and well sheltered, inside of Sea Wall Point, but it is seldom used, being so near Machias Bay and Starboard Cove, which are much easier of access and better anchorages. The mean rise and fall of tides is about 12.8 feet.

SAILING DIRECTIONS, LITTLE KENNEBEC BAY.

1. ***From the Eastward.*** — ***Entering by Foster's Channel.*** — This channel may be used by vessels coming from Machias Bay, and not drawing over 15 feet.

Bring Libby Island light to bear **S SW.**, distant about 1 mile, and steer **W.**; when nearly up

† Shown on Coast and Geodetic Survey charts: **101 a** and **102**, scale of each $\frac{1}{80,000}$, price of each, $0.50.

to Foster's Island Point buoy (spar, red, No. 2), haul to the northward and steer about **W NW.** through the channel, passing about midway between Foster's Island Point buoy and Ram Island buoy (spar, black, No. 1). When the latter buoy bears about **SE.**, distant 100 to 200 yards, steer **N NW.** ½ **W.** and pass about 400 yards to the eastward of Shag Ledge — the small, low islet surrounded by bare ledges at low water — which will be seen on the port bow. Continue the **N NW.** ½ **W.** course, passing about 350 yards to the eastward of Hickey Island, the next island to the northward of Shag Ledge. When the northern end of Hickey Island bears about **SW.** steer about **N NE.**, giving the eastern shore a berth of about 300 yards. Follow the eastern shore at this distance, and when nearly up to Hope Island — small island off the western shore about 1¼ miles above the entrance — anchor in the channel in 3½ to 7 fathoms of water. Strangers should not attempt to go above Hope Island without a pilot.

Having come through Foster's Channel, if bound into Englishman Bay, when to the northward of Ram Island buoy (spar, black, No. 1), steer about **W NW.** ¾ **W.** for the northern end of Halifax Island. When about ½ mile from this island steer **NW.** by **N.**, and follow the directions for Englishman Bay.

Vessels may enter between Scabby Island and Ram Island, passing about midway between them, and when abreast of Ram Island buoy follow the directions in the preceding paragraphs.

Remarks.—The directions, if closely followed, will lead clear of dangers, but it is advisable for vessels bound up the bay to take a pilot.

On the **W.** course, Starboard Island Ledge buoy (spar, red and black horizontal stripes), marking the southern edge of Starboard Island Ledge, should be left at least ⅛ mile on the starboard hand. *Foster's Island Point buoy* (spar, red, No. 2), marking the southern end of Foster's Island, should be left about 50 yards on the starboard hand. *Ram Island buoy* (spar, black, No. 1) marks the northern end of a ledge making out from Ram Island, and should be left about 100 yards on the port hand.

Dangers.—**Pierson's Ledge**, bare at low water, lies about 300 yards from the eastern shore and a little over ¼ mile **NNE.** from the northeastern end of Shag Ledge.

1 A. ***From the Westward.***—Follow the directions in Section 1 for entering Englishman Bay, and when about midway between The Brothers and Scabby Islands, steer about **N.** by **E.** ½ **E.**, so as to leave Shag Ledge about 400 yards on the starboard hand; continue the same course until about midway between the eastern shore and Hickey Island; follow the eastern shore, giving it a berth of 300 yards, and anchor as directed in Section 1.

Or, follow the directions for Englishman Bay, and when the southern end of Halifax Island bears **SW.** ¼ **W.**, steer **NE.** ¼ **E.** Pass about 400 yards to the northward of Hickey Island and about 300 yards to the southward and eastward of Fan Island, and then follow the eastern shore, giving it a berth of 300 yards, and anchor as directed in Section 1.

See Remarks and Dangers under Section 1, foregoing, and under Section 1, Sailing Directions, Englishman Bay.

ENGLISHMAN BAY, ROQUE ISLAND HARBOR, CHANDLER BAY, AND CHANDLER RIVER.†

These waters lie to the northward, between Libby Islands and Head Harbor Island, forming a large bight, with Roque Island in the middle and numerous smaller islands off the entrance. Englishman Bay and Chandler Bay are the approach to Chandler River, Roque Island separating the bays at their southern parts; above Roque Island they unite and form an excellent anchorage with 3¼ to 6 fathoms of water; good holding ground.

Englishman Bay, to the eastward of Roque Island, is of little importance except as an approach to Chandler River and Jonesboro. There are numerous unmarked dangers in the bay before reaching the anchorage, and strangers should not attempt to enter except with a fair wind. The principal entrance to the bay from the eastward is between Scabby Islands on the east and The Brothers on the west, and affords a straight course to Shoppee's Island, which is below the anchorage. It may be entered from Machias Bay through Foster's Channel, but it is not advisable for strangers to use this passage. Vessels from the westward, bound to the anchorage at the head of Englishman Bay or to Chandler River, usually pass through Chandler Bay, the channel of which is buoyed and readily followed in the daytime in clear weather.

Roque Island Harbor includes the large bight in the southern side of Roque Island, and the water immediately to the northward of several islands extending to the eastward from Roque Island; the westernmost and largest of these islands is **Great Spruce Island**, and the easternmost, **Halifax Island**. This harbor affords good shelter from all

† Shown on Coast and Geodetic Survey charts: **101a** and **102**, scale of each $\frac{1}{80,000}$, price of each $0.50.

winds, but it is only used by fishermen and small vessels well acquainted with the locality; the holding ground is not good except in spots, and strangers are advised not to anchor in it. The passages into the harbor from the southward, between the islands, are more or less obstructed by ledges; the westernmost, between Great Spruce Island and Double Shot Island, has two spots with 15 and 17 feet, respectively, over them, but is otherwise clear and easy to enter. The usual and best entrance is from the eastward and north of Halifax Island. There are several ledges inside the harbor which are not marked.

Chandler Bay is on the west side of Roque Island, and extends to the northward from Mark Island to **Squire's Point**, the northwestern point of Roque Island, where it joins Englishman Bay. A good channel leads to the eastward of Ballast Island and around Squire's Point into Englishman Bay and Chandler River. The principal dangers in this channel are buoyed, and it can be readily followed in the daytime in clear weather. This bay is the approach from the westward to Chandler River and the anchorage in Englishman Bay, and the one most generally used by strangers. There is no anchorage in the bay until north of Roque Island. Vessels of 21 feet draught can safely pass up to the anchorage.

Shorey's Cove is a bight, with 8 to 13 feet of water, in the north shore of Roque Island; it is a good anchorage for small vessels but is little used. **Pond Cove**, to the northeastward of **Great Head**, the northeastern point of Roque Island, has excellent anchorage in 12 to 18 feet of water, but is much obstructed by fish weirs. **Mason's Bay**, a shallow, unimportant body of water, makes in to the westward on the western side of the mouth of Chandler River.

Chandler River empties into the head of Englishman Bay; the entrance is between Nepp's Point on the east and Look's Head on the west, and is about 400 yards wide. The river a little above the entrance widens and then again contracts, and is very narrow and crooked to Jonesboro, the head of navigation, about 3½ miles above its mouth. Strangers should not attempt to enter without a pilot.

Jonesboro is a village on the north bank; vessels of 10 feet draught go up to it at high water; 12 feet is the deepest draught entering the river.

Supplies.—Provisions and ship chandler's stores can be obtained in Jonesboro.

Ice closes the river to its mouth from December to April.

For tidal data see table, page 15. The mean rise and fall of tides in Roque Island Harbor is 12.3 feet.

SAILING DIRECTIONS, ENGLISHMAN BAY, TO AN ANCHORAGE NORTH OF ROQUE ISLAND.

1. ***Approaching and Entering.—From the Eastward.***—When Libby Island light bears **NW. ½ W.**, distant 2¼ miles, steer about **W NW.** for the eastern end of The Brothers. Pass ½ to ¾ mile **S.** of Libby Island light, and when within 1 mile of The Brothers, and the southern end of Scabby Island bears about **N NE. ½ E.**, distant about ½ mile, change the course to **NW.** by **N.** for Shoppee's Island. Keep this island on the bearing until nearly up to it, then haul to the westward so as to leave it about 300 yards on the starboard hand. When abreast the northern end of Shoppee's Island steer about **W NW.** and anchor to the northward of Roque Island in 3¼ to 6 fathoms of water.

Or, if drawing less than 10 *feet*, when abreast the northern end of Shoppee's Island, steer about **N.** by **W. ½ W.** and anchor in 12 to 14 feet of water, not more than ½ mile to the westward or northwestward of Pond Cove Island. Vessels of 8 feet or less draught may anchor in Pond Cove to the northward of Pond Cove Island, but it is much obstructed by fish weirs.

The bay may be entered from the eastward through Foster's Channel; see sailing directions for Little Kennebec Bay.

If desiring to enter Roque Island Harbor.—This is not a good anchorage, and is seldom used except by light-draught vessels with local knowledge. On the **NW.** by **N.** course up Englishman Bay, when about ½ mile to the northward of Halifax Island, change the course to about **W. ½ S.** and stand in, keeping near the center of the harbor. The bottom is hard and rocky except in the extreme northern part where soft bottom will be found.

Remarks.—The Brothers, when seen from the eastward, will appear as one island. On the **NW.** by **N.** course The Brothers buoy (bell, black) and Green Ledge buoy (spar, black, No. 3) will be left about ½ mile on the port hand. **Halifax Island**, low, with thin growth of scrub firs on its eastern end, will be left about ½ mile on the port hand. **Cow Point**, a thickly wooded point, will appear on the starboard bow, and **Shoppee's Island**, flat with straggling trees, will be ahead. The houses of a small village will be seen as the bight between Cow Point and Shoppee's Island is opened.

There is a good anchorage for light-draught vessels close to the eastward of the southern end of Shoppee's Island, but the eastern shore of the bight should be given a berth of at least ½ mile.

Dangers.—There are no outlying dangers from the eastward until abreast **Scabby Island Ledge**, which is bare at low water, and lies about 250 yards to the westward of Scabby Island; it is unmarked, but may be avoided by giving the southern end of Scabby Island a berth of at least ¼ mile.

There are a succession of **unmarked shoal spots**, with from 10 to 16 feet of water over them, making to the

northward from Halifax Island to Great Head; they will be left from ¼ to ½ mile on the port hand if the NW. by N. course is made good. The channel into Roque Island Harbor passes between these spots.

Cod Head Ledge, a small rocky spot, bare at low water, lies about 1 mile E NE. ¾ E. from the northern point of Halifax Island. It is unmarked, but will be left about ½ mile on starboard hand when on the NW. by N. course.

Shoals make off over ½ mile to the eastward from Roque Island, leaving the channel abreast Shoppee's Island about 600 yards wide.

1 A. *Approaching and Entering.—From the Westward.*—To enter between The Brothers and Scabby Island.—Shape the course so as to pass 2 miles to the southward of Moose Peak light, and when it bears N NW. head about NE. for Scabby Island. When the northern edge of The Brothers bears W., distant about ¾ mile, steer NW. by N. for the western edge of Shoppee's Island; keep it on that bearing, and follow the directions in Section 1, foregoing.

To pass between Green Ledges and Halifax Island.—With Moose Peak light bearing N NW., distant 2 miles, steer NE. ½ N. for the western end of The Brothers. Keep a sharp lookout for Jumpers Ledge buoy (spar, red and black horizontal stripes). When about ¾ mile from The Brothers steer N. for the western end of Halifax Island. When about ¾ mile from Halifax Island, with Green Ledges bearing E., change the course to NE. by E. ½ E., and when the southern edge of Halifax Island bears W., distant about ¾ mile, steer NW. by N. for the western edge of Shoppee's Island; then follow the directions in Section 1, foregoing.

Remarks.—The red whistling buoy, lying 2 miles S SE. from Moose Peak light-house, will be passed close aboard.

On the NE. ½ N. course Ram Island will appear a little open to the eastward of Scabby Island; Libby Island light will be on the starboard bow and The Brothers on the port bow. The passage between Green Ledges and Halifax Island should not be used by vessels of over 16 feet draught, as there is a shoal spot with 21 feet over it midway between Halifax Island and Green Ledges.

On the N. course the western end of Halifax Island will appear as a high rocky head, joined by a sand bar to the main part of the island, which is low. Jumpers Ledge buoy (red and black horizontal stripes) will be left about ½ mile on the port hand.

Dangers.—**Jumpers Ledge**, a small and rocky spot, bare at low water, is marked by a buoy (spar, red and black horizontal stripes). It lies about 1½ miles SW. by W. ¾ W. from the western end of The Brothers.

Pulpit Rock, a low, bare, rocky isle, lies 1 mile W. by N. from the western end of The Brothers. It is surrounded by deep water.

Green Island, bare, rocky islet, and **Green Island Ledges**, which extend to the eastward from the island, lie to the northward of and are separated from The Brothers by a buoyed channel.

The southern edge of Halifax Island should not be approached nearer than ¼ mile so as to avoid small rocky spots, bare at low water, making out from the southeast end of this island.

See also "dangers," under Section 1, foregoing.

SAILING DIRECTIONS, CHANDLER BAY, TO AN ANCHORAGE NORTH OF ROQUE ISLAND.

1. *Approaching and Entering.—From the Eastward.*—When Libby Island light is made, shape the course so as to pass ¾ of a mile to the southward of it, and when it bears N. steer W. by N., leaving The Brothers and Pulpit Rock about ¼ mile on the starboard hand, and Jumpers Ledge buoy (spar, red and black horizontal stripes) ¼ mile on the port hand. When the eastern end of Mark Island bears S SW., distant ½ to ¾ mile, change the course to N. ½ W., and pass midway between Ballast and Roque islands. When Squire's Point, the north point of Roque Island, bears about E., steer E NE.; pass midway between Great Bar buoy (spar, black, No. 7) and Squire's Point, then haul to the eastward and anchor to the northward of Roque Island in from 3½ to 6 fathoms of water.

Or, if wishing to anchor in Pond Cove.—When Squire's Point bears S., shape the course about NE. by E. ½ E. so as to pass 300 to 400 yards to the eastward of Little Ram Island. When the island bears NW., steer about NE. into the cove, and anchor in 14 to 16 feet water, soft bottom.

If bound up Chandler River take a pilot.

Remarks.—On the W. by N. course **The Brothers**, bare and rocky, will appear as one island, until they are nearly abeam, and should be left at least ¼ mile on the starboard hand to avoid the rocky spots to the southward of them. **Pulpit Rock**, prominent, rather high and bare, will be a little on the starboard bow, and **Mark Island**, high, dark, with bluff rocky faces, will show very prominently a little on the port bow. The course leads about midway between **Pulpit Rock** and **Jumpers Ledge** buoy (spar, red and black horizontal stripes) and ½ mile to the southward of Great **Spruce** and **Little Spruce** islands, and well clear of all dangers making out from them.

On the N. ½ W. course **Ballast Island**, bare of trees, and grassy, will show a little on the port bow, and **Parker's**

Head, on the western side of Roque Island, will show as a high bluff, thickly wooded. Ballast Island Ledge buoy (spar, black, No. 5) should be left about ¼ mile on the port hand and Roque Island Reef buoy (spar, red, No. 2) ⅛ mile on the starboard hand. Great Bar buoy (spar, black, No. 7) should be left from 200 to 300 yards on the port hand. The western side of Roque Island is quite bold-to and may be approached as close as 300 to 400 yards except off Roque Island Reef (see dangers).

There is a passage to the westward of Ballast Island, but it is so obstructed by shoals and rocks that it is seldom used.

Dangers.—**Jumpers Ledge**, a small ledge with 5½ feet of water over it, lying ⅝ mile **S. ¼ W.** from Pulpit Rock, is marked by a buoy (spar, red and black horizontal stripes).

Pulpit Rock, lying about 1 mile **W.** by **N.** from The Brothers, is prominent and may be easily avoided.

A dangerous unmarked rock, bare at low water, lies nearly 1¼ miles **SW.** by **W.** ⅝ **W.** from Pulpit Rock.

Eastern Ledges, unmarked, but bare in one place at low water, lie about 2 miles **W SW.** from Pulpit Rock and 1¼ miles **E SE.** ½ **E.** from the eastern end of Mark Island. When any sea is running these ledges are marked by breakers.

Roque Island Reef making out about ¼ mile to the northwestward from Squire's Point is marked by a buoy (spar, red, No. 2).

Great Bar is an extensive shoal, partly bare at low water, making out from the mainland to the edge of the channel north of Squire's Point. Its southeastern edge is marked by a buoy (spar, black, No. 7).

1 A. ***Approaching and Entering.—From the Westward.***—When Moose Peak light is made, shape the course so as to pass 2 miles south of it, and when it bears **N NW.** steer **N NE.** so as to pass about ½ mile to the eastward of Black Head. When the eastern end of Mark Island bears **NW.** change course and steer for it, keeping it on that bearing. When ½ mile from Mark Island change course to **N.** ½ **W.**, passing about ¼ mile to the eastward of it, and heading so as to pass to the eastward of Ballast Island; then follow the directions in Section 1, foregoing.

Remarks. The **N NE.** course from the whistling buoy leads ½ mile to the eastward of **Black Head**, the southeastern end of Head Harbor Island, whose dark, bare, steep rocks will show prominently on the port bow.

Mark Island is very prominent and easily picked up.

Dangers.—**Black Ledge**, marked by black spar buoy No. 1, is a dangerous, rocky spot, bare at low water about ¼ mile to the eastward of Head Harbor Island. It should be approached with caution, as the buoy marking it is liable to get out of position, and it is so bold-to that the lead gives no warning of danger.

Breaking Ledge is a 9-foot rocky spot ⅜ mile **NE.** from Black Ledge. It is unmarked, but the sea breaks on it except in very smooth weather.

The other dangers are described under the heading "Dangers," Section 1, foregoing.

COAST BETWEEN CHANDLER BAY AND PLEASANT BAY.†

Lying between Chandler Bay and Pleasant Bay and extending about 5 miles to the southward from Moose-a-bec Reach is a group of islands, which, though of no commercial importance, form several prominent landmarks for vessels passing along the coast. The passages between these islands lead to several small and sheltered anchorages, which are not available for strangers on account of numerous unmarked rocks and ledges. Fishermen frequent this locality and usually anchor for shelter in Head Harbor, Mistake Harbor, or Mud Hole.

Head Harbor Island, the easternmost of the group, is nearly 2½ miles long in a **NW.** and **SE.** direction; its southeastern point, **Black Head**, is a high, bare, rocky hill, and very prominent from the eastward. **Steel's Harbor Island** is about ⅞ mile in diameter, and lies to the southwestward of Head Harbor Island; there is a passage between them, obstructed by islands and ledges, which is called **Head Harbor**, near its southern end. This harbor affords a sheltered anchorage with from 15 to 21 feet of water, but it is small, and has unmarked dangers on both sides of the channel and entrance. Strangers should not enter without a pilot. A peculiarity of the entrance to Head Harbor is that the rocks of Man Island, the eastern side of the entrance, are dark, and those on the western side are light in color.

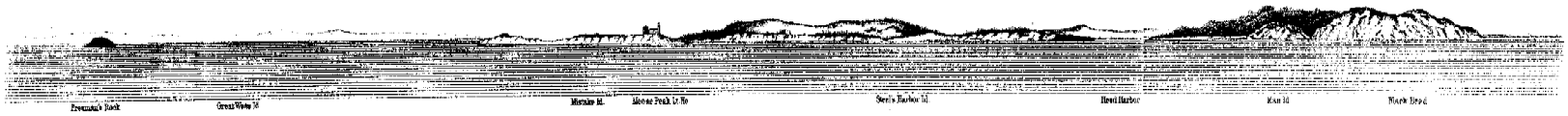
Mistake Harbor is on the northwestern side of Steel's Harbor Island, and is entered from the southward through the **Main Channel Way**, a deep but narrow channel leading between Steel's Harbor Island on the east and Mistake and Knight's islands on the west. Moose Peak light marks the western point at entrance. This harbor affords good shelter, with 3 to 7 fathoms of water. The best anchorage is just to the northwestward of the northern end of Knight's Island, in 3 to 4½ fathoms. **Water Island Channel** leads between Mistake Island on the east and Water Island on the west, into Mistake Harbor; it is unfit for navigation, having numerous unmarked dangers.

The waters to the northward of the Mud Hole between Great Wass Island and Head Harbor Island, are locally known as the **Eastern Bay**; a thorough local knowledge is required for their navigation.

Mud Hole Channel is to the westward of Water Island and leads in a northwesterly direction to the **Mud Hole**,

† Shown on Coast and Geodetic Survey chart: 102, scale $\frac{1}{80,000}$, price $0.50.

Entrance to Moos-a-bee Reach from the Eastward, Mark Id. bearing N.W. by W. distant 3 Miles.



Approaches to Head Harbor, the Lt. Ho. bearing N.N.W. ½ W. distant 2½ Miles.

a long, narrow cove in the eastern side of Great Wass Island, much used as an anchorage by fishermen who enter the cove at high water and lie aground at low water. There is good anchorage for a limited number of vessels at the entrance to **Sand Cove** and **Mud Hole**, in 14 to 30 feet of water, soft bottom. On the western side of the Mud Hole Channel and extending in a northwesterly direction nearly 1 mile to Little Cape Point, is an irregular line of rocks and ledges, many of them bare at half tide and low water; these can be avoided by favoring the islands on the eastern side of the channel. **Freeman's Rock**, a bare rock about 40 feet high, is on the western side of the entrance, but as the ledges before mentioned extend some distance to the eastward of Freeman's Rock, it should be given a berth of ½ mile. To the westward of the rock and between it and Little Pond Head, the southeastern point of Great Wass Island, is a bight which a stranger should not enter; it has no anchorage and the line of ledges before mentioned make it impossible for a stranger to stand to the northward between them without the greatest risk.

Great Wass Island is 4 miles long in a **N.** and **S.** direction and about 1¼ miles wide at its widest part; at its northwestern end **Beal's Island**, about 1¼ miles long in a **N.** and **S.** direction and ⅝ mile wide, is joined to it by ledges which are bare at low water.

Crumple Island is a high, bare, rocky island showing several knubbles; on the northern end of the highest is a flagstaff and lookout-house for the Life Saving Station. The island is about ⅝ mile west of **Pond Point**, the southwestern point of Great Wass Island, and there is a deep-water channel between them, but a stranger should never use it. **Fisherman's Island** lies to the northwestward of Crumple Island, and between the two are shoals and ledges leaving a passage for boats only. This island has several small huts and dead trees on it. **Browney Island** lies north of Fisherman's Island and is surrounded by ledges and rocks; the passage between them can only be used by boats. From the northern end of Browney Island a broken line of ledges and rocks extend to Great Wass Island. There is a channel with about 11 feet of water through these ledges, but it is not marked and is used only by those acquainted with the locality.

The waters to the westward of Great Wass Island are locally known as **Western Bay**. **Egg Rock**, a bare rocky islet, lies about 1 mile to the westward of the southern end of Fisherman's Island. There are numerous rocks and ledges between Crumple Island and Egg Rock. **Western Egg Rock** is a small, bare, rocky islet about ¼ mile to the northward of Egg Rock. **Sea Horse Rock** is a small rock, bare at half-tide, lying ⅝ mile to the westward of Egg Rock.

There are several groups of islands lying to the northwestward of Egg Rock and extending to the westward from the northern end of Great Wass Island to Nash Island. The principal of these are Ram Islands, Stevens' Island, the Drisco Islands, Sand Islands, Plummer Island, Flat Island, and Cone Island; beside these there are numerous rocks and ledges, and the islands on the south side of Moose-a-bec Reach. **Black Rock** is a dangerous cluster of rocks showing out of water, which lie 2¼ miles **S SE.** ¼ **E.** from Nash Island light-house and nearly 3¼ miles **W NW.** ¼ **W.** from Egg Rock.

GENERAL DIRECTIONS, MISTAKE HARBOR.

This anchorage should only be used by strangers in cases of extreme necessity, as a fair wind is necessary to enter or leave.

Give the ledges to the southwestward of Moose Peak light a good berth and steer so as to pass 400 yards to the eastward of the light; then steer about **NW.** ⅝ **N.**; this course will lead fair into the Main Channel Way between Steel's Harbor Island on the east and Knight's Island on the west. When in the middle of the channel way steer about **NW.** ¼ **N.**, and when the northern end of Knight's Island is on the port beam steer a little more to the westward and anchor in 19 to 24 feet water, soft bottom, before it bears to eastward of **SE.**

Remarks.—Vessels delayed by a head wind in Mistake Harbor sometimes beat out through the Mud Hole Channel, but it requires local knowledge to avoid the many dangers which lie on both sides. **Knight's Island** is the long, narrow island on the west side of the Main Channel Way. To the northwestward of this island are several small islands and a number of ledges.

When coming to anchor care should be taken to keep clear of a small ledge, which shows bare at low water at its southern end and lies ½ mile **N NW.** ½ **W.** from the northern end of Knight's Island, and 650 yards **W SW.** from the northern end of Hall's Island; it is about 150 yards long **N NW.** and **S SE.** and 30 yards wide, with deep water on all sides. At low water the ledge is easily avoided as it can then be seen, but strangers entering after the ledge is covered, should anchor before they are on a line drawn from the northern end of Hall's Island to the northernmost of the bare rocks on the western side of the harbor, to the northwestward of Knight's Island.

GENERAL DIRECTIONS, MUD HOLE CHANNEL.

Strangers should not use this anchorage, except in cases of necessity.

Bring Moose Peak light to bear **NE.**, distant about ⅜ mile, and steer **NW.** ½ **N.** The shore of Water Island should be left about 300 yards on the starboard hand, and Sandy Point should be ahead. When the northern end of Water Island bears to the southward of **E.**, the shore of Great Wass Island may be approached as close as 200 yards.

Continue the **NW.** ½ **N.** course, and when the bight at the entrance to Mud Hole and Sand Cove is opened, haul to the westward and anchor midway between Sandy Point and Mud Hole Point in 3 to 6 fathoms of water, soft bottom.

Remarks.—**Channel Rock**, one of the Black Ledges, is a small rock showing bare except at high water, about 600 yards **E NE.** ½ **E.** from Freeman's Rock; it marks the western side of the entrance to Mud Hole Channel. The other dangers are avoided by closely following the directions.

Sandy Point is low and rocky and usually has a fish weir near its end. **Mud Hole Point** is high, with bare, rocky faces, and its top covered with a scrubby growth of bushes and trees.

When well up toward Mud Hole Point some houses at the head of Sand Cove, the small cove just to the westward of Sandy Point, will show conspicuously.

MOOSE-A-BEC REACH †

is the narrow passage west of Chandler Bay, leading between the mainland on the north and the group of islands between Chandler Bay and Pleasant Bay on the south. Mark Island is the most prominent guide to the eastern entrance and Nash Island light to the western entrance. This passage is an important thoroughfare and is much used by vessels of 12 feet or less draught in the daytime. Sailing vessels of over 12 feet draught should not attempt to pass through without a pilot. Under the supervision of the U. S. Engineers, the eastern entrance has been straightened and dredged to a width of 200 feet and a depth of 14 feet; it is well buoyed and can readily be followed in the daytime in clear weather, but no vessel should attempt to pass through at night. Pilots can be had at the eastern entrance by sending to Kelley's Point, and at the western entrance by sending to either Cape Split Harbor or Tabbott's Narrows. The channel to the westward of the dredged channel has a least width of 300 yards in several places before reaching Tabbott's Narrows, but it is straight, and the most prominent dangers are marked by buoys or spindles. Vessels headed off by the wind or caught in a fog while passing through the reach anchor anywhere in the channel where the bottom is soft.

Jonesport is a village on the north shore about 1¾ miles west of Kelley's Point. The steamers of the Portland and Machias line stop here; the depth of water at the end of the steamboat wharf is about 11 feet at low water; the other wharves run dry. Pilots for Chandler River and the waters to the eastward, and also as far west as Mt. Desert, can generally be found at Jonesport by making inquiries on shore. Between **Hopkins' Point**, the point on the north shore about 1½ miles to the westward of Jonesport, and Tabbott's Narrows a large bight makes into the northern shore. Several islands lie in the entrance at the eastern side of the bight, and near its head is **Moose Island**, which is connected at its northern end with the mainland by a causeway. The narrow, crooked channel on the eastern side of Moose Island is known as **Indian River**, and that on the western side as **West River**. These waters are of no importance and are visited only by local craft.

Ice during January and February obstructs navigation in Moose-a-bec Reach.

Tides.—The mean rise and fall of tides at Jonesport is 11.7 feet (see table, page 15).

SAILING DIRECTIONS, MOOSE-A-BEC REACH.

Vessels passing through the reach should be guided entirely by the buoys and spindles, as the channel is narrow in places, with rocks and ledges on both sides. The following directions should enable a vessel of 12 feet draught to pass through at ordinary low water with a leading wind.

1. ***From the Eastward.***—Bring Libby Island light to bear **N.**, distant ¾ mile, and steer about **W.** by **N.** Leave The Brothers and Pulpit Rock about ¼ mile on the starboard hand and Jumpers Ledge buoy (spar, red and black horizontal stripes) about the same distance on the port hand. Mark Island will be on the port bow, and when its eastern end bears **SW.** steer about **W.** ⅝ **S.**

A red spar-buoy (No. 2) will be made on the starboard bow, and a black nun-buoy (No. 1) and black iron spindle, with cage on top, will be made on the port bow.

Leave black buoy No. 1 about 50 yards on the port hand and steer **W.**; leave red buoy No. 4 about 75 yards on the starboard hand and pass about 30 yards south of red spar-buoy No. 6. When abreast this buoy change the course to **W.** ¾ **N.**, and leave black spar-buoy No. 3 on the port hand and red spar-buoy No. 8 on the starboard hand. From red spar-buoy No. 8 the course is about **W NW.** ½ **W.**, leaving black spar-buoy No. 5 on the port hand and red spar-buoy No. 10 on the starboard hand. The **W NW.** ½ **W.** course, continued about ¾ mile past red spar-buoy No. 10, leads to the northward of black spar-buoys Nos. 7 and 9.

From black spar-buoy No. 9, steer a **W.** ½ **N.** course a little over 4 miles. When nearly up to

† Shown on Coast and Geodetic Survey charts: **304a**, scale $\frac{1}{40,000}$, price $0.20; and **102**, scale $\frac{1}{80,000}$, price $0.50.

the steamboat wharf at Jonesport, red spar-buoy No. 12 will be left on the starboard hand. The island on the south side of the channel should receive a berth of 300 yards. *Fessenden's Ledge* (marked by a red iron spindle with spherical cage on top) will be made nearly ahead, and should be left 150 to 200 yards on the starboard hand. After passing Fessenden's Ledge, black spar-buoy No. 11 will be left on the port hand. When this buoy bears about **SE.**, shape the course **SW.** by **W.**, leaving *Shabbit Island*, low, flat, covered with trees and rocky fringe at the water's edge, about ¼ mile on the port hand. A red spar-buoy (No. 14) and black spar-buoy (No. 13) will be made ahead, and the **SW.** by **W.** course should lead midway between these buoys and through *Tabbott's Narrows*, the passage between Ram and Sheep islands. When past these islands, shape the course **W SW.** and pass about ¼ mile to the northward of *Cone Island*, the large island which bears ahead while passing between Sheep and Ram islands; Nash Island and the light will open to the westward of Cone Island.

With Nash Island light bearing **SE.**, distant ⅜ mile, a **SW.** ½ **W.** course, made good 8½ miles, will lead to the whistling buoy off Petit Manan; a **W NW.** ¾ **W.** course, made good, will lead for the northern end of Pond Island and entrance to Narraguagus Bay; a **N.** by **W.** ½ **W.** course, made good, leads into the entrance of Pleasant Bay.

Remarks.—There are two channels for entering from the eastward; the northern channel should be used and great attention paid to the buoys, which must not be mistaken for those marking the southern channel (Seguin Passage).

Dangers.—The principal dangers in approaching are Jumpers Ledge, Pulpit Rock, and Eastern Ledges (described on pages 41, 42); the dangers at the eastern entrance and along the Reach are so numerous that no descriptions of value can be given (see descriptions of the Reach).

1 A. ***From the Westward.***—Bring Nash Island light to bear **SE.**, distant ⅜ mile, and steer **E NE.**, heading so as to pass at least ¼ mile **N.** of Cone Island and directly for Tabbott's Narrows. Red spar buoy No. 14 and black spar buoy No. 13, at the eastern entrance of the narrows, should be made ahead. Pass midway between these buoys; steer **NE.** by **E.** and reverse the directions in Section 1, foregoing.

Remarks.—The rocks on the eastern side of Tabbott's Narrows are light in color and those on the western side are dark.

CAPE SPLIT HARBOR.†

This is an irregular shaped cove mostly taken up by flats and ledges, between which a channel about 200 yards wide and 1 mile long affords good anchorage for a limited number of vessels. The depth in the channel varies from 7 fathoms near the entrance to 12 feet near its head, and the holding ground is good. The flats are soft mud, and small vessels sometimes haul out on them to overhaul and clean bottom. The entrance, bearing **NE.** ¾ **N.** from Nash Island light-house, is about 350 yards wide and has several dangerous ledges off its eastern point that show bare at low water. The harbor is sometimes used by vessels bound through Moose-a-bec Reach, but it is not a desirable anchorage for strangers, Pleasant Bay being easier of access and a better anchorage. Pilots for Moose-a-bec Reach can be obtained in Cape Split Harbor by inquiring on shore.

PLEASANT BAY AND RIVER.†

Pleasant Bay lies north of Nash Island and has an excellent anchorage, with 14 to 18 feet water, good holding ground. The entrance of the bay is between Cape Split on the east and Flint Island on the west, and is about 2 miles wide; the available width for entering, however, is only 1¼ miles on account of a group of islands on the eastern side of the entrance. The bay extends 3¾ miles in a **N NE.** direction above Flint Island and gradually contracts in width up to Guard Point, where Pleasant River empties into it. There are numerous islands and ledges in the bay, but the most important dangers are marked by buoys, so that in the daytime, in clear weather, vessels of 15 feet draught can make the anchorage at low water.

Flint Island Narrows is a deep passage leading from Pleasant Bay to Narraguagus Bay, between Flint and Dyer's islands. It is used principally by steamers and is not recommended for sailing vessels on account of strong tidal currents, and ledges which make out from the southern shore of Dyer's Island and contract the channel to a width of about 200 yards. A black spar-buoy is placed on the northern edge of the ledges making off from the northeastern side of Flint Island and marks the eastern entrance to the narrows.

On the western side of Pleasant Bay, between Ripley's Neck and Dyer's Island, is the entrance to Harrington Bay and River. **Strout Island**, high, covered with a scrubby growth of trees near its southern end and the highest point of the island cleared, is 3¾ miles **N NW.** from Nash Island light and in the middle of the entrance to Harrington Bay. The channel leads to the westward of Strout Island.

† Shown on Coast and Geodetic Survey charts: **305**, scale $\frac{1}{40,000}$, price $0.25; **102**, scale $\frac{1}{80,000}$, price $0.50.

Pleasant River has a narrow and crooked channel with a least depth of 5 feet at low water at one place just below Addison Point; above this the river is navigable at high water as far as the village of **Columbia Falls**, about 9½ miles above its mouth. To the eastward of Guard Point, in the entrance of the river, is an excellent though narrow anchorage with 3 to 7 fathoms, and in the channel for a distance of 1½ miles above the entrance good anchorage will be found in 3½ to 6 fathoms. Strangers should not attempt to enter the river without a pilot.

Addison Point, a village about 4½ miles above the mouth of Pleasant River, has some trade in lumber. Vessels of 12 feet draught go up as far as this; there is from 2 to 4 feet of water alongside the wharves. Just above Addison Point the river is crossed by a bridge (width of draw about 35 feet). The village of **Columbia Falls** is 5 miles above; the deepest draught of vessels trading there is 9 feet. The wharves run dry at low water.

The channel leading into the bay and as far up as Night Cap Island is in no place less than ½ mile in width with a least depth of 6 fathoms. Above Night Cap Island a channel with a least depth of 16 feet leads to the eastward and one with 17 feet to the westward of Barton's Ledge and Birch Islands; these channels unite at the mouth of the river close to Seavey's Point—the eastern point at the entrance—where the width is about 250 yards and the depth from 3¾ to 5½ fathoms. The channel holds this width and depth for ¾ of a mile above its mouth; it then narrows very rapidly, running in many places between flats that are bare at low water.

The best and most frequently used anchorage in Pleasant Bay is to the southeastward and eastward of Birch Islands where there is excellent holding ground in 13½ to 18 feet water, sheltered from all winds. There is also good anchorage in 19 to 40 feet of water off the mouth of the river.

Fish weirs will usually be found along the eastern and western shores of the bay above the southern end of Birch Islands, between them and Raspberry Island, and on the shoals making out to the eastward from Guard Point; they do not extend out in the channel so as to interfere with navigation.

Pilots can generally be found at Cape Split or in Narraguagus Bay, and can always be obtained from the anchorage in the bay. Strangers bound to Addison Point or Columbia Falls should take a pilot.

Ice obstructs navigation in the river from December to April.

The **currents** follow the general direction of the channel except at Marsh Island, where it cuts over toward the eastern shore.

The mean rise and fall of tides is 11 feet at Nash Island and 11.3 feet at Addison Point. It is high water at the latter place 34 minutes later than at Nash Island.

SAILING DIRECTIONS, PLEASANT BAY.

The following directions lead to the anchorage and are available for vessels of 14 feet at low water; vessels of greater draught should take a pilot.

1. ***Approaching and Entering.—From the Eastward.***—From the whistling buoy lying 2 miles **S SE.** from Moose Peak light-house, steer **W. ¼ S.**, or, if closer inshore, shape a course so as to leave the islands at least ¾ mile on the starboard hand. When Egg Rock, the westernmost island, bears **N.**, distant from ¾ mile to 1¼ miles, steer **W NW.** When Nash Island light bears **N.** by **W. ½ W.**, shape the course **N NW. ¼ W.** so as to pass about ⅜ mile to the westward of the light, and when it bears **E.** steer about **N. ¼ W.**, leaving Cole's Ledge buoy about ¼ mile on the port hand and heading so as to pass about ½ mile to the westward of Norton's Island. When Norton's Island Ledge is on the starboard beam, distant about ⅜ mile, steer **N NE. ½ E.**; leave Night Cap Island about 300 yards on the starboard hand, and when past the island steer about **NE.** by **E.** and anchor to the eastward of the south end of the Birch Islands in 14 to 17 feet water, soft bottom.

If bound into Pleasant River, take a pilot.

Remarks.—When Egg Rock bears **N.** and the course is changed to **W NW.**, Sea Horse Rock, bare at half-tide and breaking at high water, will be seen ⅜ mile to the westward of Egg Rock. On the **W NW.** course Black Rock will be made on the starboard bow; and on the **N NW. ¼ W.** course it should be left ⅜ mile on the starboard hand, and **Flint Island**, high, round, bare hill, with scattered trees on its western side, will be ahead. On the **N. ¼ W.** course Ripley's Neck and Narrows Island will be ahead. Norton's Island Ledge will be made on the starboard bow and Cole's Ledge buoy will be left about ⅜ mile on the port hand. On the **N NE. ¼ E.** course Birch Islands will be ahead and Barton's Ledge a little on the port bow; **Night Cap Island**, smooth, round top, covered with grass, will be on the starboard bow. When standing to the eastward between Night Cap and Birch Islands, **Port's Harbor**, a narrow cove in the eastern shore, will be ahead; the eastern shore at the anchorage should not be approached closer than 250 to 300 yards.

The channel to the anchorage in the mouth of the river leads along the eastern side of Birch Islands, which should be given a berth of about 250 yards.

Dangers.—**Black Rock** is a small group of detached rocks lying 2¼ miles **S SE. ¼ E.** from Nash Island light-house. There is deep water all around these rocks, some of which show bare at high water.

A ledge, the southern end of which shows bare, extends about 500 yards to the southward from Nash Island.

Cole's Ledge, a small rock, showing bare near low water, with deep water around it, lies about ¼ mile to the

eastward of Flint Island; a buoy (spar, black, No. 1) is placed about 100 yards to the eastward of the ledge. The southeastern side of Flint Island should be given a berth of at least ¼ mile.

Big Pot, Pot Rock, and **The Ladle** are rocky islets lying to the eastward of the channel into Pleasant Bay; Big Pot, the westernmost, is about on a line between Nash and Norton's islands.

Norton's Island Ledge, showing bare in spots at high water, lies nearly ¼ mile **W.** from the southwestern point of Norton's Island. The reef, making out to the southward from Norton's Island, is marked by a black iron spindle with cage on top. Vessels entering the bay should pass ⅜ mile to the westward of Norton's Island to clear the ledge.

Narrows Island Ledge is a small ledge dry at half-tide, and lies on the western side of the channel, ⅜ mile **SW.** from the southeastern point of Narrows Island. A spot with 13 feet of water over it lies about 400 yards **S.** from the southeastern point of Narrows Island; this is left on the port hand when standing up the bay.

Night Cap Ledge extends in a broken line for nearly 700 yards south of Night Cap Island. A part of the ledge nearest the island is dry at half-tide; there are spots with 7 and 14 feet over them to the southward of the dry part of the ledge.

Barton's Ledge is a small ledge, showing bare at half-tide and surrounded by 3¼ to 5 fathoms of water, about 500 yards **S SW.** from the southwestern point of Birch Islands; it is marked by a buoy (spar, red and black horizontal stripes) placed about 50 yards to the southward of the ledge. The buoy is left on the port hand when bound east of Birch Islands, and on the starboard hand when bound west of the islands.

Bunker's Ledge, dry at half-tide, lies to the westward of the southernmost Birch Island and is marked off its southeastern side by a buoy (spar, black, No. 3). The ledge extends about 225 yards to the northward and westward of the buoy; the channel leads to the eastward of the buoy, and there is a depth of 14 feet to the westward of the ledge.

1 A. ***Approaching and Entering.*** — ***From the Westward.*** — From the whistling buoy, 1 mile **S.** of Petit Manan light, steer **NE.** ½ **E.** about 8 miles; Nash Island light will then bear about **E.**, distant ⅜ mile. From this position steer **N.** ¼ **W.**, and proceed as in Section 1.

Remarks. — On the **NE.** ½ **E.** course, Nash Island light will be made a little on the starboard bow and Flint and Shipstern islands on the port bow; the course leads about ⅜ mile to the westward of Nash Island light. On the **N.** ¼ **W.** course, Flint Island is left about ½ mile on the port hand and Norton's Island Ledge about ⅜ mile on the starboard hand. The remarks in Section 1, preceding, should be applied for the courses above Norton's Island Ledge.

Dangers. — **Petit Manan Reef** is described in Section 1 A, "Sailing Directions, Narraguagus Bay," page 51.

Simms Rock, a small rock with a least depth of 6 feet over it, lies 1⅝ miles **S.** from Petit Manan light-house; it is marked by a buoy (nun, red and black horizontal stripes). The buoy should be given a berth of ⅜ mile; there is deep water around the rock.

Southeast Rock, a small rock with a least depth of 5 feet over it, lies about 3¼ miles **S SE.** ¾ **E.** from Petit Manan light-house, and 1⅞ mile **SE.** by **E.** from Simms Rock buoy. The rock is marked by a buoy (can, red and black horizontal stripes), which should be given a berth of ¼ mile.

Jo Leighton's Ground, least water 15 feet in one spot, lies 2⅛ miles **NE.** by **E.** from Petit Manan light-house; it is not marked, and is left nearly ½ mile on the port hand when on the **NE.** ½ **E.** course.

Jackson Ledge, nearly ¼ mile in diameter, with a least depth of 3¾ fathoms, lies about 2½ miles **E.** by **S.** from Petit Manan light-house; this ledge is not marked, but is left about 1¼ miles on the starboard hand when on the **NE.** ½ **E.** course.

Tibbett Rock, a small rock with a least depth of 12 feet over it, lies 3⅝ miles **E.** from Petit Manan light-house. The rock is not marked, and is left well on the starboard hand when on the sailing line.

Jordan's Delight Ledge is a long scattered ledge to the southeastward of Jordan's Delight; the southern end, which shows bare at low water, is left about ⅞ mile on the port hand when on the **NE.** ½ **E.** course from the whistling buoy off Petit Manan. See also page 51.

Cole's Ledge and other dangers in Pleasant Bay are described under Section 1, preceding.

HARRINGTON BAY AND RIVER.†

Harrington Bay makes to the northward from the western side of Pleasant Bay; its entrance lies **NNW.** from Nash Island light. It is separated from the upper part of Pleasant Bay on the east by Ripley's Neck, and from Narraguagus Bay on the west by Foster's Island. The bay extends 2½ miles in a **N.** by **E.** direction from Strout Island to Chamberly Island, where it is met by Harrington River from the northeastward and the waters from Flat Bay and Mill River from the northwestward. It has a depth in the channel of 4¾ fathoms, and good anchorage in 5 to 7 fathoms of water, but is seldom used except by vessels owned in the vicinity or by those acquainted with the locality.

Flat Bay and **Mill River** are mostly bare at low water.

Harrington River has a narrow, crooked channel, with a depth of only 2 feet at low water. The town of **Harrington** is at the head of navigation on Harrington River, about 4 miles above its mouth; ship-building is the

† Shown on Coast and Geodetic Survey chart: **305**, scale $\frac{1}{40,000}$, price $0.25; and **102**, scale $\frac{1}{80,000}$, price $0.50

principal industry. The greatest draught taken up to the town is 12 feet; the usual draft 6 to 10 feet. There is 2 feet of water alongside the wharves at low water.

Dyer's Island Narrows, the passage between Dyer's Island and Foster's Island, has a depth of 9 feet at low water, and connects Harrington Bay with Narraguagus Bay. This passage is the one commonly used by the steamers of the Portland and Machias line, but should not be attempted by strangers or sailing vessels, as it has many unmarked dangers and strong currents.

Ice forms in the river and in the bay between December and April as far down as Ripley's Neck.

Tides.—The mean rise and fall of tides is the same as in Narraguagus Bay (see table, page 15).

GENERAL DIRECTIONS, HARRINGTON BAY.

Strangers should not attempt to enter Harrington Bay without a pilot. The dangers are numerous, as will be seen by consulting Coast and Geodetic Survey chart No. 305.

From Pleasant Bay to an anchorage in Harrington Bay.—When abreast of Norton's Island Ledge stand over toward the western shore and keep to the southward of Narrows Island Ledge and the ledges to the eastward of Strout Island. Follow the eastern shore of Dyer's Island, giving it a berth of 400 yards, and when the western side of Strout Island bears **N.** steer for it so as to pass to the eastward of *Otter Island*, the small island at the mouth of a small cove **SW.** from Strout Island. Give the western shore of Strout Island a berth of about 100 yards, and when up to Eastern Flats buoy (spar, black, No. 1) steer about **N NE.**, leaving *Shag Island*, a small, bare rock which will be seen on the starboard bow, 125 yards on the starboard hand. When Shag Island is a little abaft the beam, haul to the eastward and follow the eastern shore of the bay, giving it a berth of about 300 yards. Anchor anywhere in the channel where the depth of water and character of the bottom are favorable.

If bound into Harrington River, take a pilot.

Remarks.—By closely following the above directions a least depth of 4½ fathoms can be taken to an anchorage. Care should be exercised when passing Shag Island, as there is a ledge with 5 feet over it about 300 yards to the northwestward of the island. The sailing line leads between the island and ledge. The western side of the bay is shoal and should be avoided by strangers.

NARRAGUAGUS BAY †

lies about **N.** by **E.** from Petit Manan and **NW.** by **W.** from Nash Island. The lower part of the bay is a well-sheltered anchorage much used as a harbor of refuge in all seasons by vessels up to 18 feet draught. The principal dangers in the channels are buoyed, and the light-houses on Nash, Petit Manan, and Pond islands (Narraguagus light), see table of lights, p. 16, are guides for the entrance. Trafton's Island lies in the middle of the lower end of the bay, with a good channel on each side. The upper end of the bay and the western shore above Trafton's Island are shallow. The eastern shore is formed by Dyer's and Foster's islands, between which Dyer's Island Narrows, a narrow buoyed channel, with 9 feet at low water, leads into Harrington Bay; north of Foster's Island is **Back Bay**, which runs dry at low water with the exception of a small channel into Harrington Bay.

Douglas Island Harbor lies north of the Douglas Islands and west of Pond Island. It has from 4 to 6 fathoms water but is seldom used except by fishermen, the anchorage above Trafton's Island being much better. A narrow, crooked channel leads from the western side of Douglas Island Harbor, between Joe Dyer's Point on the north and Bois Bubert Island on the south into Pigeon Hill Bay, but it is not available for strangers on account of its numerous unmarked rocks and ledges.

Narraguagus River empties into the northwestern part of the bay and is a narrow stream which runs dry in places at low water.

Millbridge is a town about 2 miles above **Turner's Point**, the western point at entrance to the river. The principal industries are canning fish and ship building. Vessels of 16 feet draught can go up to the town; the usual draught is 10 feet. There is from 5 to 8 feet of water at the ends of some of the wharves at low water. The steamers of the Portland and Machias line stop here, and the river is crossed by a bridge at this point.

Cherryfield is 4 miles above Millbridge. Its principal industry is lumber, which is brought down to Millbridge in scows at high water. The saw-dust from the lumber mills here has been gradually filling the channel near Turner's Point. It is proposed to dredge a channel, 11 feet deep at low water and 200 feet wide, up to upper steamboat wharf, and 9 feet deep above this to the anchorage off Fickett's Point. In 1888, under the supervision of the General Government, a channel 11 feet deep, at low water, and from 50 to 75 feet wide, was dredged through the shoalest part of the channel to the lower steamboat wharf, above Turner Point.

† Shown on Coast and Geodetic Survey charts: 305, scale $\frac{1}{40,000}$, price $0.25; and 102, scale $\frac{1}{80,000}$, price $0.50.

Prominent objects.—**Nash Island light-house** (see table of lights, p. 16) is to the eastward of the entrance. **Petit Manan light-house** (see table of lights, p. 16) is about **S SW.** ¾ **W.** from the entrance, and the most conspicuous and easily recognized object when coming from the westward. **Pigeon Hill**, round, smooth, bare top, 307 feet high, bears **N.** ½ **E.** from Petit Manan. **Bois Bubert Island**, large, bare, desolate looking, whitish rocks, lies **N.** by **E.** ½ **E.** from Petit Manan; it can be readily distinguished by its color and barren appearance. **Jordan's Delight** is a small, high island, wooded except at its extreme northern end, lying about 5 miles **NE.** ½ **N.** from Petit Manan and 3½ miles **W.** ½ **S.** from Nash Island. **Pond Island**, seen from the southward, appears like a bare, conical hill, about 160 feet high. The northern end of the island is low and level, with one large house and several smaller ones. **Narraguagus light-house** (see table of lights, p. 16) is on the eastern side of the island.

The group of islands between Pond Island and Bois Bubert Island are the **Douglas Islands.** **Shipstern Island**, recognizable by its peculiar appearance, is small, high, covered with trees, and has perpendicular, corrugated, rocky bluffs on its south side. It lies 2⅝ miles **NW.** by **W.** ¼ **W.** from Nash Island and just to the westward of Flint Island, which is much the larger. **Trafton's Island**, about 1½ miles **N NE.** from Pond Island, is fair in the middle of the entrance to the bay. The large island to the eastward of Trafton's Island and north of Shipstern Island is **Dyer's Island**, which forms a part of the eastern shore of the bay.

Channels.—The approach from the eastward is free from dangers; from the westward around Petit Manan there are several ledges, some of them marked, which can be avoided by watching the bearings of the light. The eastern channel passes close to the east side of Trafton's Island and is about ¼ mile wide. Tommy's Island and Western Ledge lie on the eastern side of this channel. The western channel is about ⅜ mile wide between Trafton's Island and Baldwin's Head; the Lower Middle Ground lies ¼ mile from the western shore above Baldwin's Head. The channel from Turner's Point to Millbridge is narrow and crooked and should not be attempted by a stranger without a pilot.

Anchorages.—The usual anchorage for vessels seeking shelter is between Trafton's Island and the Lower Middle Ground buoy, in 21 feet water, soft bottom; vessels of 10 feet draught or less sometimes anchor in 14 to 17 feet water north of Trafton's Island, about midway between it and the spindle on Half Tide Ledge. Vessels bound up to Millbridge anchor in 14 to 16 feet water about ½ mile east of Turner's Point, the lower wharf bearing about **W NW.** Good anchorage in 24 feet water, soft bottom, will be found about ⅜ mile **NE.** from the spindle on Half Tide Ledge.

Pilots are not necessary to enter the bay. A stranger desiring a pilot should get one at Little River or Jonesport to the eastward, or at Southwest Harbor or Bar Harbor to the westward. Fishermen who are good pilots can usually be found, if the weather is fine, on the ledges off Petit Manan. Pilots to take vessels up to Millbridge can be found at Turner's Point.

Tow-boats.—A small steamer at Millbridge will tow vessels if required. Vessels of over 175 tons generally tow up to Millbridge from Turner's Point.

Supplies.—Anthracite and bituminous coal in limited quantities, water, provisions, and ship-chandler's stores can be obtained.

Repairs.—There is a set of blocks at Millbridge on which small vessels are repaired. Temporary repairs to larger vessels can be made in case of necessity by hauling on the beach in Mitchell's Cove.

Ice seldom obstructs navigation except in January and February, during which months the river is frozen to its mouth.

The mean rise and fall of tides is about 11.2 feet. See table page 15.

SAILING DIRECTIONS, NARRAGUAGUS BAY.

1. ***Approaching and Entering.***—***From the Eastward.***—Follow the directions for approaching Pleasant Bay (page 46); bring Nash Island light to bear **N.**, distant about 2½ miles, and steer about **NW.** ¾ **N.** so as to clear the western end of Trafton's Island. When Narraguagus light bears **SW.**, distant about ¾ mile, steer **N NE.** Pass midway between Trafton's and Tommy's islands, and when the northern end of Tommy's Island is abeam steer **N.** Anchor anywhere to the northward or eastward of Half Tide Ledge spindle (red, with wheel on top) in 13 to 24 feet of water.

If wishing to pass to the westward of Trafton's Island, continue the **NW.** ¾ **N.** course until nearly up to it; bear to the westward so as to give the southern end of the island a berth of about 200 yards; then haul to the northward and anchor anywhere between Trafton's Island and Lower Middle Ground buoy (spar, black, No. 3).

Or, if wishing to anchor off the Lower Steamboat Wharf.—Follow the directions in the preceding paragraph, and with Trafton's Island bearing **E.**, distant 200 to 300 yards, steer **N.** by **E.** and pass midway between Half Tide Ledge spindle and Lower Middle Ground buoy; when the Lower Steamboat Wharf bears about **W NW.** anchor in from 12 to 16 feet of water a little more than ½ mile from the wharf.

If wishing to anchor in Douglas Island Harbor.—When Narraguagus light bears **SW.**, distant about 1 mile, steer about **W NW.**, and when Pond Island Ledge buoy (spar, black, No. 1) bears **S.**, distant about ¼ mile, steer **W SW.**, until the northern end of Pond Island bears **SE.**, then change course to the southward and anchor ¼ to ½ mile to the westward of Pond Island in from 4 to 6 fathoms of water.

Remarks.—Strangers wishing to go to Millbridge should take a pilot off Turner's Point or get a tow-boat from Millbridge. **Flint Island Narrows**, separating Flint Island and Dyer's Island, connects Narraguagus and Pleasant bays, but the passage should not be attempted by strangers.

There is an excellent anchorage in from 14 to 18 feet of water to the northward of Trafton's Island, about ¼ to ½ mile south of Half Tide Ledge Spindle. Douglas Island Harbor is not much used, as the anchorage in Narraguagus Bay is much better.

On the **NW. ¾ N.** course **Baldwin's Head**, showing bare and light colored, will be open a little to the westward of Trafton's Island. Shipstern Island will show prominently on the starboard bow, and Jordan's Delight and Pond Island on the port bow.

On the **N NE.** course, when passing to the eastward of Trafton's Island, Western Reef buoy (spar, red, No. 2) should be left about ¼ mile on the starboard hand. Above Trafton's Island care should be taken not to be set on Half Tide Ledge, marked by a spindle (red, with wheel on top). Trafton's Island is bold-to on its southern and western sides and may be approached as close as 200 yards.

Making an anchorage in Douglas Island Harbor, North Point of Pond Island Ledge buoy (spar, black, No. 1) will be left on the port hand. The northern end of Pond Island should not be approached nearer than ½ mile to avoid the shoals making out from it. The north end of Dyer's Island just showing north of Trafton's Island clears these shoals.

Dangers.—**Black Ledge** is described under Section 1 A, following.

Western Reef, making off from the southern end of Tommy's Island, is marked by a red spar-buoy (No. 2) lying ½ mile **NW. ¾ W.** from Shipstern Island.

Pond Island Ledge, making out to the northward of Pond Island, is marked at its northern end by a buoy (spar, black, No. 1) lying about ⅝ mile to the northward of the island.

Lower Middle Ground is an extensive shoal on the western shore, commencing a short distance above Baldwin's Head and extending to Turner's Point. It extends from ¼ to ⅝ mile from the shore, has from 2½ to 12 feet of water over it, and is marked on its eastern side by a buoy (spar, black, No. 3) lying **W. ½ S.**, distant ½ mile from Half Tide Ledge spindle.

Trafton's Island Ledge is a small bare rock lying in the center of the entrance to the cove formed by the northern points of Trafton's Island. Vessels should not attempt to pass between this ledge and the island.

Half Tide Ledge, partly bare at low water, is about 600 yards long in a **N.** and **S.** direction, and about 150 yards wide; it lies ¾ mile **N.** from the middle of Trafton's Island, and is marked near its northern end by a spindle (iron, wheel on top).

1 A. ***Approaching and Entering.—From the Westward.***—Shape the course so as to pass 1 mile to the southward of Petit Manan light and close to the whistling buoy. From the whistling buoy steer **N NE. ⅞ E.** for the western end of Jordan's Delight; or, steer so as to pass ½ mile to the eastward of Petit Manan light; bring it to bear **SW. ½ S.** and steer **NE. ½ N.**, keeping the bearing. When Narraguagus light bears **N.** by **E.** steer for it until the northern end of Jordan's Delight bears **E.**, then steer **N NE. ½ E.** until the north end of Pond Island bears about **W.** by **N.**, taking care to give the shore of Pond Island a berth of 400 yards while to the eastward of the light. With the north end of Pond Island bearing **W.** by **N.** steer **N NE.** and follow the directions in Section 1 to pass to the eastward of Trafton's Island.

If wishing to pass to the westward of Trafton's Island, proceed as directed above until Narraguagus light bears about **W SW.**, then change course to **N. ¾ W.** so as to pass about 200 yards to the southwestward of Trafton's Island and follow the directions given in Section 1, foregoing, for passing to the westward of Trafton's Island.

If wishing to anchor in Douglas Island Harbor.—When, on the **N. ¾ W.** course in the preceding paragraph, Trafton's Island has been approached to about ½ mile, steer **W NW.** and follow the directions given in Section 1, foregoing, for anchorage in Douglas Island Harbor.

Remarks.—In thick weather the sound from the fog-signal on Petit Manan is subject to aberration. In some instances, vessels coming from the westward have been unable to hear it when close up to the island.

Douglas Island Harbor may be entered from the southward through the passages between the Douglas Islands but they are so narrow and obstructed by unmarked dangers that strangers should not attempt them.

Vessels drawing 8 feet or less, approaching from the westward, may pass to the northward of Petit Manan Island over Petit Manan Bar by passing close to Petit Manan Bar buoy (spar, black and white perpendicular stripes), but strangers are not advised to attempt it as the buoy is difficult to pick up and tidal currents run with considerable velocity.

On the NE. ½ N. course **Shipstern Island** will show a little open to the eastward of Jordan's Delight. The southeastern end of Bois Bubert Island will be left about ¾ mile on the port hand. Jordan's Delight is bold-to on its southern and western sides, but should be given a berth of at least 100 yards. Pond Island to the southward of the light-house is bold-to, but to the northward of the light it should be given a berth of ¼ mile. There is a small rock with 4 fathoms over it lying ⅜ mile E. from the northern end of Pond Island; this is not dangerous except for deep draught vessels at low water and in a heavy sea.

Dangers.—**Petit Manan Reef**, making off nearly ½ mile to the southward of Petit Manan Island, is marked by a buoy (can, red, No. 2) placed off its southern end which should be given a berth of not less than 200 yards when passing inside the whistling buoy.

Simms Rock, **Jackson Ledge**, and **Tibbett Rock** are described under "Dangers," page 47.

Jo Leighton's Ground has a small unmarked 15-foot rocky spot on it lying 2⅛ miles NE. by E. from Petit Manan light-house. The general depth over the shoal is 4½ to 7 fathoms.

Whale Ledge, an unmarked rocky ledge, bare at low water, lies 1⅞ miles N. by E. ½ E. from Petit Manan light-house, and about ½ mile S. by W. from **Egg Rock**, a low rocky isle surrounded by ledges on all sides. The NE. ½ N. course, if made good, leads about midway between Jo Leighton's Ground and Whale Ledge, and ¾ mile from the 15-foot spot on the former.

Jerry's Ledge, an unmarked shoal, lies about ⅜ mile to the eastward of the southern end of Bois Bubert Island; it will be left about ½ mile on the port hand when on the NE. ½ N. course.

Jordan's Delight Ledge lies to the southeastward of the island, with deep water between them; its northern end, bare at half tide and known as **Black Ledge**, is ⅝ mile E SE. from the southern end of Jordan's Delight. It extends in a broken line a general S SW. ¼ W. direction for 1 mile to a small rock, bare at low water, which lies a little over 1 mile S. ¼ E. from the southern end of Jordan's Delight. The part of this ledge which does not show bare is usually marked by breakers.

There is a dangerous unmarked 9½-foot spot about 350 yards NE. by E. ½ E. from Narraguagus light-house, to avoid which, the light-house should not be approached nearer than ¼ mile.

For further description of dangers entering Narraguagus Bay or Douglas Island Harbor see "Dangers" under Section 1, foregoing.

PIGEON HILL BAY AND PETIT MANAN BAR. †

This bay, the entrance of which is also known as Bois Bubert Harbor, lies north of Petit Manan and west of Bois Bubert Island; it affords good anchorage in 12 to 24 feet of water, but is seldom used except by those well acquainted with the locality. **Petit Manan Bar** connects Petit Manan Island with Petit Manan Point on the mainland; it is composed of ledges and large boulders, between which is a channel, marked by a buoy, which may be used by vessels of 8 feet draught at low water when the sea is smooth. The sea breaks along the whole length of the bar in heavy weather and the tidal currents set over it with great velocity, the flood to the northeastward, the ebb to the southwestward; sailing vessels are cautioned not to approach the bar in a light breeze.

The approach to the entrance of Pigeon Hill Bay is to the eastward and northward of Petit Manan Island, between it and the ledges making to the southward from Bois Bubert Island. The dangers are not marked but can be avoided by closely following the directions.

There is a narrow channel (Eastern Passage) from Pigeon Hill Bay into Douglas Island Harbor and Narraguagus Bay; it leads north of Bois Bubert Island, between unmarked rocks and ledges, and is available only for those having local knowledge. **Pigeon Hill**, the high, bare topped hill on the western shore near the head of the bay, is conspicuous and a landmark for some distance at sea.

For tidal data see table, page 15.

SAILING DIRECTIONS, PIGEON HILL BAY.

1. ***Approaching and Entering.—From the Eastward.***—Steer for Petit Manan light, taking care to keep clear of Tibbett Rock and Jackson Ledge, described under Section 2 A, page 22. Bring Petit Manan light to bear W., distant a little over ¼ mile, and steer N., taking care not to be set to the westward by the ebb current. When the light is about 1 mile distant on the port quarter, haul to the westward and bring it to bear S. ½ W. astern and steer N. ½ E., keeping on the bearing. When abreast the southern end of Bois Bubert Island, follow a mid-channel course and anchor above the Gull Rocks in 4½ fathoms water, soft bottom.

Remarks.—On the N. course **Egg Rock**, small bare islet surrounded by dark boulders, will be a little on the starboard bow, and at half-tide Whale Ledge will be seen to the southward of it. The N. ½ E. course leads about ¼ mile to the westward of Egg Rock and directly for the highest point of Pigeon Hill. The upper part of the bay is usually obstructed by fish weirs, between which a narrow channel is left to pass through the Eastern Passage.

Dangers.—**Whale Ledge** is a small ledge, bare at half-tide and usually breaking at high water; it lies a little over ¼ mile S. ¼ W. from Egg Rock. A spot with 13 feet of water over it lies about 400 yards to the southward of this ledge.

† Shown on Coast and Geodetic Survey charts: 305, scale $\frac{1}{40,000}$, price $0.25; and 102, 103, scale $\frac{1}{80,000}$, price of each $0.50.

Egg Rock, at low water, shows as a large ledge of dark boulders with several high parts which are always out of water; it lies 2¼ miles **N.** by **E.** from Petit Manan light-house. There is a narrow channel between Egg Rock and Bois Bubert Island, but a stranger should not attempt it.

Rocks and **ledges** make off from the eastern shore of Petit Manan Point to about ½ mile of Egg Rock; these have from 7 to 16 feet of water over them. A spot with 3 feet over it lies nearly ⅝ mile off the shore and ¾ mile **NW.** ½ **W.** from the northern end of Egg Rock; the channel leads to the eastward of it.

Gull Rocks is a large ledge, bare at half-tide, making off from the shore of Bois Bubert Island about 1⅝ miles **N.** of Egg Rock. These rocks are avoided by giving the shore of Bois Bubert Island a berth of ⅝ mile or keeping in mid-channel.

1 A. ***Approaching and Entering.—From the Westward.***—Shape the course so as to pass about 1 mile **S.** of Petit Manan light. From the whistling buoy steer so as to pass at least ¼ mile to the eastward of the light, taking care not to be set to the westward on to Petit Manan Reef by the ebb current. Bring Petit Manan light to bear **W.**, distant a little over ¼ mile, and follow the directions in Section 1, preceding.

See "Remarks" and "Dangers" under Section 1, preceding.

DYER'S BAY.†

This bay, the entrance to which lies **N NW.** ½ **W.** from Petit Manan light, has excellent anchorage in 4 to 8 fathoms of water, but it is seldom used except by fishermen and small vessels owned in the vicinity. A group of islands, with narrow, deep passages between them, extend from the westward across the entrance of Gouldsborough Bay, and part way across Dyer's Bay entrance, leaving a good passage nearly ½ mile wide between the easternmost island, **The Castle**, and Petit Manan Point. One mile above The Castle the channel is contracted to a width of 250 yards by rocks and ledges, which extend out from both shores and have a depth of 9 to 11 feet over them. Above this the channel widens to ½ mile, and contracts gradually to ¼ mile to the westward of Sheep Island. The least water in the channel is 3¼ fathoms, but a stranger should not attempt to enter without a pilot, unless with a vessel drawing not more than 9 feet of water and in daylight.

The tidal currents are strong in the entrance of the bay, but follow the general direction of the channel except near Dyer's Point, where they set in and out of Gouldsborough Bay; here great caution is necessary.

Pinkham's Bay, at the head of Dyer's Bay, is full of rocks and ledges; a narrow, crooked channel with a depth of 8 feet at low water leads for some distance toward its head, which runs dry at low water.

Dyer's Harbor, north of Sheep Island and west of Good's Point, is very shallow; the upper part is dry at low water.

Carrying Place Cove makes in to the southeastward, north of Sheep Island; the head of this cove is partly dry at low water.

SAILING DIRECTIONS, DYER'S BAY.

1. ***Approaching and Entering.—From the Eastward.***—When at the whistling buoy off Petit Manan Island steer **N NW.** ½ **W.**; as soon as the south end of Petit Manan Point is in range with Egg Rock, bearing **E.** by **N.**, steer **N.** ¾ **E.**, passing to the eastward of The Castle. When past The Castle haul to the westward; bring it to bear **S.** by **W.** ½ **W.** astern, and steer **N.** by **E.** ½ **E.**, passing up the middle of the bay. Anchor in 3¾ to 8 fathoms when 2 miles above The Castle, **SE.** of Parker's Head.

Remarks.—On the **N NW.** ½ **W.** course care should be taken not to be swept on Petit Manan Bar or Point by the flood current setting to the **NE.**; the point should be given a berth of ½ mile. The western shore of Petit Manan Point, from its southern end until nearly up to Yellow Birch Head, should be given a berth of 300 to 400 yards. **Yellow Birch Head** is the high, bare bluff on the eastern shore, about ⅞ mile **NE.** ½ **N.** from The Castle.

1 A. ***Approaching and Entering.—From the Westward.***—When at the whistling buoy off Schoodic Island steer **NE.** by **E.** ½ **E.** until on a line between the south end of Petit Manan Point and The Castle; then steer **N.** ¾ **E.**, passing to the eastward of The Castle, and follow the directions in Section 1, foregoing.

Remarks.—On the **NE.** by **E.** ½ **E.** course Old Woman, Old Man, Big Black, and Little Black ledges will be left on the port hand. These ledges are bare at half-tide and the sea breaks on them at all times. **Little Black Ledge**, the easternmost of the ledges, bears **NE.** by **E.** ¼ **E.**, distant 3½ miles from the southern end of Schoodic Island. **Moulton's Ledge**, showing at low water and marked by a buoy (spar, red and black horizontal stripes), will be left well on the starboard hand, and **Stone Horse Ledge**, with 11 feet on it, lying nearly ⅞ mile **NE.** by **N.** from Moulton's Ledge, will be left on the starboard hand. The course leads well to the southward of the islands off Gouldsborough and Dyer's bays.

† Shown on Coast and Geodetic Survey charts: **305**, scale $\frac{1}{40,000}$, price $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50.

As the western shore of Petit Manan Point is approached, Dyer's Bay will be fairly opened out, and Yellow Birch Head, on the eastern shore, will show prominently. Standing up the bay **Sheep Island**, which has a growth of tall trees, will be a little on the starboard bow.

GOULDSBOROUGH BAY †

lies **NW.** ½ **N.** from Petit Manan and about 1¾ miles to the northeastward of **Cranberry Point**, the eastern point at entrance to Prospect Harbor. This bay is about 4½ miles long in a **N.** and **S.** direction and 1 mile wide, and is an excellent anchorage with from 2 to 9 fathoms of water. A chain of small islands and ledges extends across the entrance; between them are two navigable channels known as **Eastern Way** and **Western Passage**. North of these islands there is a passage from the mouth of Dyer's Bay, but it is too narrow and obstructed for a stranger to use. When approaching from the westward great care must be taken not to mistake the passages, the islands being difficult to recognize. Inside the islands the bay is free from dangers and the water shoals gradually toward its head.

Indian Harbor is a small shallow cove on the western side of the entrance to Gouldsborough Bay; it is of no importance, and can only be entered by small vessels well acquainted with the locality.

Joy's Bay, a shallow body of water 1½ miles long, with a narrow, crooked channel to the village of Steuben, makes to the northward from Gouldsborough Bay at Roger's Point; it separates into two coves at its head; the eastern one is **Steuben Harbor** and the western **Joy's Cove**.

Gouldsborough Harbor is a large shallow arm, with numerous ledges at its entrance, making into the northwestern part of Gouldsborough Bay and extending about 2½ miles to the village of Gouldsborough; it has a narrow, crooked channel, which is nearly dry at low water.

Steuben is a village at the head of Joy's Bay; it can be reached at high water by vessels of 7 to 8 feet draught.

Gouldsborough is a village at the head of Gouldsborough Harbor; it is of no commercial importance.

Channels.—The Eastern Way, or Ship Channel, leads into the bay between Eastern Island on the east and Bald Rock on the west; it is about 350 yards wide between the 18-foot curves and has a spot with 24 feet over it about 200 yards west of Eastern Island; this channel has the strongest tidal currents, and vessels can only enter with a strong favorable breeze when the current is running ebb. **The Western Passage**, or Sloop Passage, leads into the bay between Sally's Island on the east and Sheep Island on the west; it is about 200 yards wide between the 12-foot curves and leads close along the eastern side of Sheep Island; there is a spot with 18½ feet over it, about 110 yards east of Sheep Island; the tidal currents run true with the channel and have a velocity of 2 to 3 knots at strength. The channel inside the islands leads up the middle of the bay until up to Point Francis, above which the water shoals toward the eastern shore; it then runs straight from Point Francis to Garden Point, where it curves to the eastward around Roger's Point, and is narrow, crooked, and shallow in places up to the village of Steuben.

Anchorages.—Anchor anywhere in the bay from 1 mile above the islands to Point Francis in 3½ to 9 fathoms of water, giving the shores a berth of about 500 yards. There is a good anchorage in 16 feet of water about ⅝ mile **NE.** from Point Francis.

Pilots can sometimes be found fishing on the ledges outside, but in clear weather strangers should be able to enter by the chart or sailing directions.

Supplies.—Provisions can be obtained at Gouldsborough or Steuben.

Ice obstructs navigation in the head of the bay from December to March. In severe winters the bay is closed by ice down to the entrance.

Tides.—The mean rise and fall of tides is 11 feet; see table, page 15.

SAILING DIRECTIONS, GOULDSBOROUGH BAY.

A depth of 7 fathoms can be carried into the bay through the Eastern Way, and 18 feet through the Western Passage. The tidal currents have a velocity of 2 to 3 knots at strength, through these passages.

1. ***Approaching and Entering through the Eastern Way.—From the Eastward.***—From the whistling buoy off Petit Manan steer **N NW.** ¾ **W.** a little over 4 miles. Continue nearly this course, passing midway between Eastern Island and Bald Rock. When inside the islands steer a little more to the northward and stand up the middle of the bay; the water shoals gradually toward Roger's Point. Anchor **NE.** from Point Francis, in 15 to 27 feet of water, soft bottom.

To enter through the Western Passage.—From the whistling buoy off Petit Manan steer **NW.** ⅝ **N.** for the eastern side of Sheep Island. When about 100 yards distant from the eastern side of the island steer **N.** and stand up the middle of the bay. Anchor as directed above.

† Shown on Coast and Geodetic Survey charts: **305**, scale $\frac{1}{40,000}$, price $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50.

Remarks.—When standing for the entrance attention should be paid to the tidal currents which set across Petit Manan Bar with considerable velocity; the flood sets to the northeastward and ebb to the southwestward. There are no marked natural features to distinguish the different islands at the entrance of the bay. **Eastern Island** is the easternmost of these islands which have any trees; it is rocky, with ledges making off some distance from high-water mark; its western shore should be given a berth of about 125 yards.

When standing in, to the westward of Eastern Island, care should be taken not to be set too close to the islands by the tidal currents which, at strength, have considerable velocity between the islands, and set diagonally across the channel. The eastern end of Bald Rock should be given a berth of at least 125 yards.

Standing in through the Western Passage the best water is about 100 yards **E.** of Sheep Island. On the eastern side of this passage are extensive ledges which make out to the westward from **Sally's Island**, the island close to the westward of Bald Rock. After passing the northern end of Sheep Island the course leads up the middle of the bay. **Point Francis**, on its western shore, 3¼ miles above the entrance, is high and wooded, showing prominently from the lower end of the bay.

Dangers.—The ledges off Petit Manan are described under Sections 1 A, pages 47 and 51.

Moulton's Ledge is about 350 yards in diameter, showing partly bare at low water; it lies 3 miles **W NW. ¾ W.** from Petit Manan light-house, and is marked by a buoy (spar, red and black horizontal stripes) placed to the southwestward of the ledge. The buoy should be given a berth of at least ¼ mile. About ⅝ mile **S.** from Moulton's Ledge is an unmarked spot with 18 feet over it.

Stone Horse Ledge (unmarked), with 11 feet over it, lies 2⅞ miles **NW.** by **W. ½ W.** from Petit Manan light-house, and about ⅞ mile **NE.** by **N.** from Moulton's Ledge.

Shoals make off to the southward and southwestward from Dyer's Point; to avoid them give the point a berth of 400 yards when to the northward of the islands.

Ledges, some showing bare at half tide, make out about 450 yards to the westward from Sally's Island to the edge of the Western Passage.

Young's Point Ledge makes off about 300 yards to the eastward from Young's Point, the point to the northwestward of Sheep Island; the ledge has 6 feet over it near the eastern end, and is not marked.

1 A. ***Approaching and Entering through the Eastern Way.—From the Westward.***—From the whistling buoy off Schoodic Island steer **NE.** by **E. ¾ E.** about 4¼ miles until the end of Cranberry Point is in line with Prospect Harbor light, then shape the course **NE. ¼ N.**, with the eastern end of Eastern Island ahead. When about ¼ mile distant from the island steer a little more to the northward for its western side, and when it is about 200 yards distant ahead steer **N NW. ¾ W.**, heading so as to leave the eastern side of Bald Rock about 200 yards on the port hand. When to the northward of Bald Rock stand up the middle of the bay and anchor as directed in Section 1. (See also "Anchorages.")

To enter through the Western Passage.—From the whistling buoy off Schoodic Island steer **NE.** by **E. ¾ E.** until the end of Cranberry Point is in range with Prospect Harbor light; then steer **N. NE. ½ E.** for the western end of Sally's Island. When the eastern end of Sheep Island bears about **N.** by **W.**, steer **N.**, passing about 100 yards to the eastward of the island; stand up the middle of the bay and anchor as directed in Section 1, preceding.

Remarks.—On the **NE.** by **E. ¾ E.** course, the ledges off the entrance to Prospect Harbor are left well on the port hand; the end of Petit Manan Point will be a little on the starboard bow. When the course is changed to **NE. ¼ N.**, the eastern end of Eastern Island should be in range with the end of **Stanley's Point**, the easternmost point of Dyer's Neck, and three small islands off the entrance to Dyer's Bay will be a little on the starboard bow. Indian Harbor and the islands to the eastward will be broad off the port bow, and the passages between the islands into Gouldsborough Bay will be opened out. At low water many of the ledges around these islands show bare.

On the **N NE. ½ E.** course for the Western Passage the western end of Sally's Island will be ahead. When to the southward of Sheep Island give it a berth of at least 200 yards. Standing in through the Western Passage, Point Francis will be a little on the port bow. (See also Remarks under Section 1, preceding.)

Dangers.—**Moulton's Ledge** and **Stone Horse Ledge**, left on the starboard hand, are described under Section 1.

Little Black Ledge and other ledges lying off the entrance to Prospect Harbor, left on the port hand, are described under Section 1, "Sailing Directions, Prospect Harbor."

The principal dangers in the Eastern Way and Western Passage are described under Section 1, preceding.

PROSPECT HARBOR. †

This harbor lies **N NE. ¾ E.** from Schoodic Island and 6 miles **NW.** by **W. ½ W.** from Petit Manan Island. The outer harbor affords good anchorage, in all but southerly winds, for vessels of the heaviest draught. Small vessels acquainted with the locality seek shelter in the inner harbor, anchoring in 10 to 20 feet of water inside Clark's Point.

† Shown on Coast and Geodetic Survey charts: 305, scale $\frac{1}{40,000}$, price $0.25; and 103, scale $\frac{1}{80,000}$, price $0.50.

The harbor is about 1½ miles long in a N. and S. direction, and has an average width of ⅝ mile; near its head it is separated by Prospect Harbor Point into two coves, called Sand Cove and The Inner Harbor. **Prospect Harbor light** (see table of lights), the guide for entering the harbor, is on the southern end of Prospect Harbor Point.

Off the entrance to the harbor are several ledges which show bare or are marked by breakers at high water; the northwesternmost of these ledges is marked by a buoy.

Sand Cove is in the northern end of the harbor east of the light-house and is of no importance. **Inner Harbor** is the cove to the westward of the light-house; it is sheltered from all but southeast winds, but is small and only used by vessels well acquainted with the locality; the anchorage is in 10 to 20 feet, soft bottom.

Prospect Harbor village, at the head of the Inner Harbor, is of no commercial importance.

Channels.—The ledges off the entrance divide the approach into two channels. The eastern channel passes north of the ledges and close to Cranberry Point; the western is buoyed and leads west of the ledges. The depth in the approach is from 9 to 20 fathoms and very irregular. The **best anchorage** is ¼ of a mile to the southward of the light-house, just inside of Clark's Ledges spindle, in 4½ to 6½ fathoms water, soft bottom.

For tidal data see table, page 15.

SAILING DIRECTIONS, PROSPECT HARBOR.

1. ***Approaching and Entering.—From the Eastward.***—Shape the course so as to bring Petit Manan light to bear **N.**, distant ¾ mile, passing ¼ mile **N.** of the whistling buoy, and steer about **NW.** by **W.** ⅛ **W.** so as to pass about ¼ mile to the southward of Cranberry Point and keeping a bright lookout for Moulton's Ledge buoy; when Prospect Harbor light bears **N NW.** steer for it and anchor when off Clark's Point; or, haul to the northward and anchor in Sand Cove with the light bearing about **W SW.**, distant about ¼ mile.

If wishing to anchor in the Inner Harbor, continue the **N NW.** course until Clark's Ledge spindle (black, wheel and pendant on top) bears **W.**, then steer **W NW.**, giving the spindle a berth of 100 to 200 yards, and anchor when about 300 yards to the westward of a line joining the spindle and light-house.

Remarks.—The **NW.** by **W.** ⅛ **W.** course leads between Petit Manan Reef buoy (can, red, No. 2) and Petit Manan Whistling buoy (nun, red, "P. M." in black letters). Moulton's Ledge buoy (spar, red and black horizontal stripes) should be left from ¼ to ½ mile on the port hand.

Dangers.—**Moulton's Ledge**, marked by a buoy (spar, red and black horizontal stripes), is a shoal spot, the center of which is bare at low water, lying about 3 miles **W NW.** ¾ **W.** from Petit Manan light-house.

Stone Horse Ledge, an unmarked 11-foot shoal spot, lies 2⅞ miles **NW.** by **W.** ½ **W.** from Petit Manan light-house and ⅞ mile **NE.** by **N.** from Moulton's Ledge.

Little Black Ledge, Big Black Ledge, Old Man, and **Old Woman** are a succession of dangerous rocky ledges, mostly bare at low water, beginning at Little Black Ledge, about 2¾ miles **S.** by **E.** ½ **E.** from Prospect Harbor light-house, and extending in a general **W NW.** direction for about 1 mile. The western end is marked by Old Woman Ledge buoy (spar, red, No. 2), lying about **SW.** from Old Woman and about 2 miles **S.** ½ **W.** from Prospect Harbor light-house. The **NW.** by **W.** ⅛ **W.** course leads from ½ to ¾ mile to the northward of these dangers.

The Inner Harbor is much obstructed by **rocks** and **shoals**; dangerous rocky ledges make out from 350 to 400 yards on both sides of the entrance. A black spindle with wheel and pendant on top, marks the northeast end of the ledge making out from Clark's Point. It lies about 600 yards **S SW.** ½ **W.** from the light-house and should be left from 100 to 200 yards on the port hand when entering.

1 A. ***Approaching and Entering.—From the Westward.***—Shape the course so as to pass to the southward of the whistling buoy off Schoodic Island; bring the buoy to bear **W.**, distant about ½ mile, and steer **N NE.** ¼ **E.**; pass midway between Bunker's Ledge buoy (spar, black, No. 1) and Old Woman Ledge buoy (spar, red, No. 2), and stand into the harbor, giving the western shore a berth of about 600 yards. Anchor to the southward of the light-house in 7 to 8½ fathoms water, soft bottom.

Or, if desiring to anchor in the Inner Harbor.—On the **N NE.** ¼ **E.** course, when Prospect Harbor light bears **N.**, steer for it; when Clark's Ledge spindle bears **W NW.** ½ **W.** steer about **NW.** ½ **W.** and anchor in 3½ to 5 fathoms water about 400 yards to the northwestward of the spindle.

Remarks.—On the **N NE.** ¼ **E.** course Old Woman Ledge buoy (spar, red, No. 2) should be left about ⅝ mile on the starboard hand and Bunker's Ledge buoy (spar, black, No. 1) the same distance on the port hand. The light-house will be on the port bow. On the **N.** course for the light-house, the spindle will be made on the port bow; it is left on the port hand when standing for the anchorage in the inner harbor.

Dangers.—The Old Woman and the Old Man ledges are described under Section 1, foregoing.

Bunker's Ledge, marked at its eastern end by a buoy (spar, black, No. 1), extends about ½ mile to the eastward from the southern side of the entrance to Bunker's Harbor.

For dangers entering the Inner Harbor see Section 1, foregoing.

WINTER HARBOR.†

On the eastern side of Frenchman's Bay, between Schoodic Peninsula and Grindstone Neck, is an excellent harbor of refuge with good anchorage in 4 to 7 fathoms of water and good holding ground; it is comparatively free from dangers, and although open to the southward a heavy sea never enters. Coasting vessels frequently seek refuge here. **Winter Harbor light-house** (see table of lights, page 16) is the guide for entering; buoys and spindles mark the principal dangers so that a pilot is not required if the directions are closely followed. The village of **Winter Harbor** at its head, has steamboat communication with Bar Harbor in summer; it is of little commercial importance; there is 8 feet at low water alongside the wharf. **Sand Cove**, in the northwestern part of the harbor, is the usual and best anchorage. Ice seldom forms sufficiently to interfere with navigation. For tidal data see table, page 15.

SAILING DIRECTIONS, WINTER HARBOR.

These directions are good for vessels of the heaviest draught. Anchorage in 5 to 7 fathoms of water will be found in Sand Cove and in 8 to 9 fathoms water in the middle of the harbor.

1. ***Approaching and Entering.—From the Eastward or Southward.***—From the whistling buoy off Schoodic Island steer **NW. ¼ W.** When Winter Harbor light bears between **N. ½ W.** and **NE. ½ N.** steer for it; pass 300 yards to the eastward of the light and steer about **N.** by **E. ½ E.** When about 1 mile above the light steer more to the northward; follow the western shore and anchor in the middle of Sand Cove, about ¼ mile from its head.

Remarks.—Heading for Winter Harbor light, **Turtle Island**, large, partly wooded, will be on the port bow. The entrance to the harbor is to the eastward of the light. On the **N.** by **E. ½ E.** course Sand Cove will be a little on the port bow, and **Harbor Point**, low, wooded, the eastern point at entrance to Sand Cove, will be ahead. The head of Sand Cove is dry at low water. Light-draught local vessels usually anchor in **Winter Harbor Cove**, the small, shallow cove to the northward of Harbor Point.

Dangers.—**Grindstone Ledge** makes out about ¼ mile to the southward from Grindstone Neck; it is bare at half tide, and marked off its southern end by a buoy (spar, red, No. 2), and a spindle (iron, black, cage on top) on the middle of the ledge; these are left well on the port hand standing into the harbor.

Abijah's Ledge, bare at extreme low water, makes out from the eastern shore of the harbor about 1½ miles above the light-house; it is marked off its western end by a buoy (spar, red, No. 4).

1 A. ***Approaching and Entering.—From the Westward.***—Having come from South West Harbor from a position **N.** or **S.** of East Bunker's Ledge, steer **E NE. ¾ E.** until Winter Harbor light bears to the northward of **NE. ½ N.**, then steer for it and follow the directions in Section 1, preceding.

Or, from the Whistling Buoy off Baker's Island, steer **NE.** until Winter Harbor light bears **N NE.** when steer for it; pass to the eastward of it and follow the directions in Section 1, preceding.

Remarks.—Standing for the entrance to Winter Harbor from the westward, **Schoodic Mountain**, the highest point on Schoodic Peninsula, should be on the starboard bow. The western shore of the peninsula is bold-to, and can be approached to 150 yards until well inside the harbor. See dangers under Section 1, preceeding.

FRENCHMAN'S BAY.‡

This large bay, with its harbors and tributaries, lies to the westward of Schoodic Peninsula and to the eastward of Mt. Desert Island; the bay proper is about 10½ miles long in a **N.** and **S.** direction, and has an average width of about 5 miles. Half way towards its head is a group of islands extending **E.** and **W.** across the bay, between which are two good channels leading to the upper part.

Vessels of the largest size and deepest draught can find an anchorage. The principal guides to the bay from the seaward are Mt. Desert (Rock), Baker's Island, Egg Rock, and Winter Harbor lights (see table of lights, page 16). **Green Mountain**, the highest point of Mt. Desert Island, is 1,532 feet above the sea, and is visible in clear weather between 30 and 40 miles. **Mt. Desert** (Rock) **light** is 20 miles **S.** by **W. ½ W.** from the entrance and should be sighted, if possible, when approaching from seaward. Four miles **S SW.** from the western point at entrance is **Baker's Island light**; **Egg Rock light**, a short distance above and midway in the entrance, is the guide into and up the bay. Winter Harbor light, in the entrance of Winter Harbor, is on the eastern side of the bay; it is of no use to vessels above the entrance. The navigation of the bay is not difficult for strangers with the assistance of a chart and sailing directions. Some of the harbors in the upper part of the bay, however, should not be entered without a pilot.

During the winter navigation is practically closed by ice above the Porcupine Islands. Winter Harbor is the only port of refuge at that season. (See page 13.)

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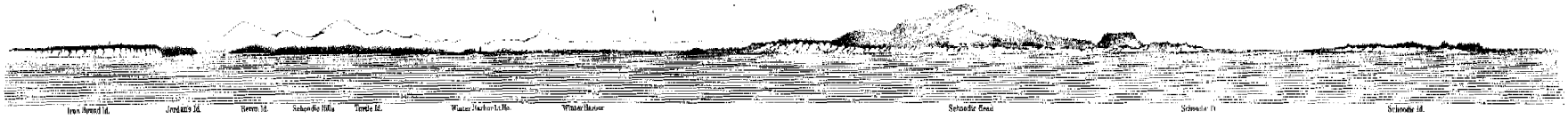
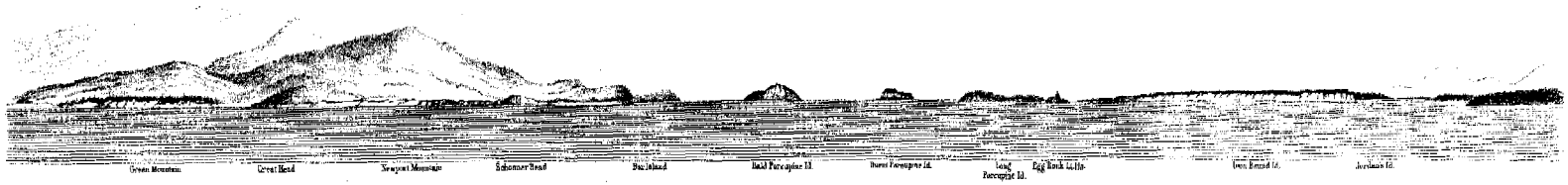
† Shown on Coast and Geodetic Survey charts: **317**, scale $\frac{1}{20,000}$, price $0.20; **306**, scale $\frac{1}{40,000}$, price $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50.

‡ Shown on Coast and Geodetic Survey charts: **306**, scale $\frac{1}{40,000}$, price $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50.



Approaches to Winter Harbor, the Lt.Ho. bearing N by E ½ E, distant 7¾ Miles.



Approaches to Frenchman's Bay, from off Schoodic, Egg Rock Lt.Ho. bearing N. ¼ E, distant 7 Miles.

BAR HARBOR

is an anchorage on the eastern side of Mt. Desert Island, about 5½ miles to the northward of Otter Creek Point, and 3½ miles **N NW. ¾ W.** from Egg Rock light-house. This harbor is formed by an indentation in the shore of Mt. Desert Island and two islands to the northward; it is exposed to southerly and easterly winds.† The bottom is rocky—holding ground bad—and the water deepens quickly from 4 to 13 fathoms. A heavy swell heaves in during southeast winds, and vessels should not attempt to ride out a gale here from that direction. The nearest good anchorage is Stave Island Harbor. There is 10 to 13 feet alongside the steamboat wharves at low water.

The Harbor Master attends to keeping a clear channel for steamers to the wharves, and has buoys placed to mark the limits within which vessels are not to anchor Coal, either anthracite or bituminous, can be had in limited quantities at the wharf or from lighters; water can be had alongside the wharves or from water-boats. Supplies of all kinds can be obtained in the town.

STAVE ISLAND HARBOR

is an excellent harbor of refuge on the eastern shore of the bay, formed by the mainland on the east, Stave Island on the north, and Jordan's Island on the south; the anchorage has a depth of 3½ to 6 fathoms, soft bottom, and is sheltered from all winds. The principal entrance, and the one used by strangers, is between Stave and Jordan's islands, but vessels well acquainted with the locality sometimes cross Jordan's Bar, which extends from Jordan's Island to the mainland. Vessels bound to West Gouldsborough, or other towns at the head of the bay, sometimes call here for pilots who can generally be found by making inquiries on shore. A stranger does not need a pilot to enter this harbor, attention to the directions or the chart being all that is necessary.

FLANDERS BAY,

in the northeastern part of Frenchman's Bay, north of Stave and Calf islands, is of no importance except as an approach to **West Gouldsborough** and **East Sullivan**, the former lying at the head of a shallow cove in the eastern part, and the latter at the head of **Bass Cove** in the northern part. There are two entrances to Flanders Bay; one across Calf Island Bar between Stave and Calf islands, and the other between Calf and Preble islands; the latter has the better water, but takes a vessel some distance out of a direct course to either of the villages. Strangers bound to West Gouldsborough or East Sullivan are advised to take a pilot in Stave Island Harbor. It is only at high water that vessels can get to these villages; 10 feet is the deepest draught entering; the wharves are dry at low water. During the summer months a small steamer plies between West Gouldsborough and Bar Harbor.

SULLIVAN HARBOR

is an arm of Frenchman's Bay making to the northward from its northern end, and lies between Waukeag Neck on the east and Crabtree Neck on the west. **Sorrento**, a popular summer resort, and **Sorrento Harbor**, a small anchorage between Preble Island and the southwestern end of Waukeag Neck, are on the east side of the entrance. The mouth of the harbor is obstructed by Bean's Island and the surrounding shoal water, but a deep channel nearly ½ mile wide leads on the western side between it and Crabtree Ledge, which is marked by **Crabtree Ledge light-house** (see table of lights, page 16), the principal guide for the entrance to the harbor. Above this the channel has a number of well-marked ledges on either hand, and is about ¼ mile wide up to the town of **Sullivan**, where it turns sharply to the **NW.** through the narrows to **Taunton Bay**, which, with the exception of a very narrow, crooked channel, is almost dry at low water. The town of **Franklin** is at the head of this bay. There is a narrow buoyed channel east of Bean's Island, but strangers should not use it.

About ½ mile above Sullivan and for a distance of about 300 yards, the narrows are so contracted and obstructed by ledges that the tidal current forms dangerous rapids known as **Sullivan Falls.** Vessels of 6 feet draught pass up at any time during the flood and of 12 feet at high water slack. Vessels coming out must pass at slack water; after the ebb begins to run the falls are not passable. The rise and fall of tide is 4 feet less above the falls than below. High water slack is 1 hour 18 minutes later and low water slack 1 hour 45 minutes later in the falls than below them.

The towns of Sullivan and Franklin are places of little commercial importance. Strangers going above the falls should take a pilot, and sailing vessels generally take a tug; they may be found at Sullivan. Halfway from Crabtree Point to Sullivan, on the western shore of the harbor, is **Mt. Desert Ferry**, a terminus of the Maine Central Railroad; it has frequent steam communication with Bar Harbor. Ice obstructs navigation during January, February, and March.

SKILLINGS RIVER

empties into the northern part of Frenchman's Bay just to the westward of Sullivan Harbor; the entrance is between Crabtree Point on the east and Meadow Point on the west, where it is 1⅝ miles wide, but it contracts rapidly, and 1¾ miles above Crabtree Point is only 400 yards wide. Above this the river leads about 4 miles in a

† A breakwater is to be built from the shore to Bald Porcupine Island, which, when completed, will make the anchorage comparatively safe.

northwesterly direction to the village of **Kilkenny**. The channel is narrow and crooked and has numerous rocks and ledges, making its navigation difficult. Strangers wishing to enter the river should get a pilot at Bar Harbor, or anchor 1½ miles above Crabtree Point in 5 to 7 fathoms water and get a pilot from South Hancock. **South Hancock** is a village on the east bank 2½ miles above Crabtree Point; 14 feet is the deepest draught trading here and 9 feet the usual draught; there is 3 feet at low water alongside the wharves; 19 feet is the least depth found in the channel at low water. There is a good anchorage in the channel abreast of the village in 4 to 7 fathoms water.

The town of **Hancock** is on the shore of a large shallow cove called Young's Bay, about 1½ miles above South Hancock, on the eastern shore of the river; it has little trade. Vessels going there lie aground at low water.

Kilkenny is a small village at the head of the river on **Kilkenny Cove**; this cove is shallow and has a narrow channel leading through it; vessels of 9 feet draught have been taken up at high water.

EASTERN BAY, MT. DESERT NARROWS, AND JORDAN'S RIVER.

These waters lie north of Mt. Desert Island, Eastern Bay and Mt. Desert Narrows separating the island from the mainland. **Eastern Bay** is the name given to a short reach to the westward of the entrance to Skilling's River; it has good water and the dangers are marked by buoys; it is about 1 mile wide. At Hadley's Point, Eastern Bay merges into **Mt. Desert Narrows**; **Berry's Cove** makes into the northern shore. There is a good anchorage with 18 to 24 feet off the entrance to the cove which is shallow at its head. To the westward of Hadley's Point the channel of Mt. Desert Narrows contracts, and shoals make out from the shore on both sides; 2½ miles above this point a drawbridge crosses the narrows from Mt. Desert Island to the mainland. At low water the island and mainland are connected by extensive flats. A stranger should not pass to the westward of Hadley's Point without a pilot.

Jordan's River, making in to the northward, just west of Berry's Cove, has a narrow, crooked channel with 5 feet at low water up to Lamoine. Strangers should take a pilot at Berry's Cove; the channel is not marked so as to be followed, except by persons well acquainted with the locality. **Lamoine** is a town on the east bank of the river just above the entrance; the deepest draught taken up to it is 15 feet; the usual draught is 10 feet; the wharves are dry at low water. Water can be had at the wharves through hose; provisions and ship chandler's stores can be obtained in the town.

Salisbury Cove, on the south side of Eastern Bay, is nearly dry at low water, but there is good anchorage in 6 to 8 fathoms between it and Googin's Ledge buoys.

In Mt. Desert Narrows the flood current sets to the westward and ebb to the eastward.

For tidal data see page 15.

SAILING DIRECTIONS, FRENCHMAN'S BAY.

The following directions are good for vessels of the heaviest draught into Bar Harbor, Stave Island Harbor, Sullivan Harbor, Skillings River, and Eastern Bay.

1. ***Approaching and Entering.—From the Eastward.***—From the whistling buoy off Schoodic Island steer **NW. ¼ W.** about 3¼ miles. When Winter Harbor light is in line with the southern end of Turtle Island change the course to **N NW. ⅝ W.**; pass ½ mile to the northward of Egg Rock and the same distance south of Iron Bound Island. Bald Porcupine Island should be left ¼ mile on the port hand. When the southern side of Bald Porcupine Island is in range with the southern point at entrance to Rodick's Cove, bearing about **W SW. ¼ W.**, if bound to any of the harbors in the bay, follow the directions in Sections 2 to 7, according to destination.

Remarks.—On the **NW. ¼ W.** course from the whistling buoy off Schoodic Island, Egg Rock light will be made ahead—the course leads ¼ mile **S.** of the southwestern point of Schoodic Peninsula.

Winter Harbor will be opened and Winter Harbor light will be seen on the western side of the entrance. On the **N NW. ⅝ W.** course **Iron Bound Island**, dark, high bluff faces, wooded on top, will be on the starboard bow and left ½ mile on the starboard hand. **Bald Porcupine Island**, a rocky island 190 feet high with rounded top, will be a little on the port bow. **Sheep Porcupine Island** will be a little on the port bow to the right and northward of Bald Porcupine Island. **Burnt and Long Porcupine islands** will be made on the starboard bow to the eastward of Sheep Porcupine Island. The entrance to Bar Harbor is to the westward between Bald and Sheep Porcupine islands, and to Stave Island Harbor to the eastward of Long Porcupine Island.

Dangers.—**Turtle Island Ledge**, bare at half tide, makes out ⅜ mile to the southward from the southwestern side of Turtle Island.

Handiron Ledge, bare in spots, makes out 300 yards in a northerly and northeasterly direction from Egg Rock. The northern and eastern sides of Egg Rock should be given a berth of about ¼ mile.

1 A. ***Approaching and Entering.—From the Southward.***—From Mount Desert Rock steer **N. by E. ½ E.** about 16¼ miles. Baker's Island light should then bear abeam, **W NW. ½ W.**, distant about 3 miles, and Egg Rock light should bear **N. by E.**, distant about 7

miles. Then steer **N.** ½ **E.** for 5½ miles, to the whistling buoy off Great Head. From the whistling buoy steer **N.** for Burnt Porcupine Island until the south end of Bald Porcupine Island and the south point at entrance to Rodick's Cove are in range, bearing **W SW.** ¼ **W.** Then follow the directions in Sections 2 to 7, according to destination.

Or, from the whistling buoy 1½ miles **SE.** ½ **S.** from Baker's Island light-house, steer **N NE.** ¼ **E.** about 6½ miles until up to the whistling buoy off Great Head, then follow the directions in the preceding paragraph.

If bound to any of the harbors in the bay, follow the directions in Sections 2 to 7, according to destination.

Remarks.—On the **N.** by **E.** ½ **E.** course from Mt. Desert Rock, Green Mountain, the highest point of Mt. Desert Island, will be on the port bow. **Great and Little Duck islands**, about 12 miles **N.** ¾ **W.** from Mt. Desert Rock, will be left about 5 miles on the port hand. Baker's Island and light will be made on the port bow and are left about 3 miles on the port hand when passing. Winter Harbor light will be made on the starboard bow, and Egg Rock light will be made ahead; the course should be changed so as to make the whistling buoy off Great Head and pass 1 mile to the westward of Egg Rock.

On the **N.** course from the whistling buoy off Great Head, Burnt Porcupine Island will be ahead (see view for positions of islands).

Dangers.—**A ledge**, bare near its end at low water, makes out ¼ mile to the southwestward from Egg Rock; to avoid it, give the southern end of Egg Rock a berth of ⅝ mile.

The dangers along the eastern shore of Mt. Desert Island can be avoided by giving that shore a berth of ⅝ mile.

1 B. ***Approaching and Entering.—From the Westward, north of the Cranberry Islands.***—Passing north of East Bunker's Ledge, when Lewis Rock buoy (spar, black, No. 3) is 300 yards on the starboard beam, steer **E NE.** ¾ **E.**, giving the shore of Mt. Desert Island a berth of ⅜ mile. When Otter Cliff Ledge buoy (bell, black) bears **N NW.** steer **NE.** ⅝ **E.** for the whistling buoy off Great Head.

Or, from a position about ¼ mile south of East Bunker's Ledge beacon, steer **NE.** by **E.** ⅜ **E.**, passing about ⅜ mile to the southeastward of Otter Creek Point. From the bell buoy off Otter Creek Point steer **NE.** ⅝ **E.** for the whistling buoy off Great Head. From this whistling buoy, if bound up the bay above the Porcupine Islands, steer **N.** until the southern end of Bald Porcupine Island bears **WS. W.** ¼ **W.**; and if bound to any of the harbors in the bay, follow the directions in Sections 2 to 7, according to destination.

Remarks.—Although the southeastern and eastern shores of Mt. Desert Island are comparatively bold-to it is advisable to give them a berth of ⅝ mile to avoid several ledges which lie off the shore between Otter Creek Point and Schooner Head.

See also "Remarks" under preceding sections.

Dangers.—**Otter Cliff Ledge**, showing bare at low water, lies about 400 yards to the eastward of Otter Creek Point. A black bell buoy is placed about 250 yards to the southeastward of the ledge.

Schooner Head Ledge, bare at low water, lies about 350 yards from the shore and about midway between Great Head and Schooner Head; a buoy (can, black, No. 3) is placed about 500 yards to the eastward of the ledge.

See also "Dangers" under preceding sections.

2. ***To enter Bar Harbor.—From the Eastward.***—Having followed the directions in Section 1, when the south end of Bald Porcupine Island is in range with the southern point at entrance to Rodick's Cove and the eastern end of the island is ¼ mile distant on the port beam, steer **NW.** by **W.** ¼ **W.**, and anchor in 4 to 8 fathoms when the eastern end of Bar Island bears about **N.**

From the Southward or Westward.—Having followed the directions in Section 1 A or 1 B, from the whistling buoy off Great Head steer **N.** until the eastern end of Bald Porcupine Island is ¼ mile distant on the port beam, then steer **NW.** ¼ **W.** and anchor as directed above.

Or, from the whistling buoy off Great Head, steer **N.** by **W.**; pass 350 yards east of The Thrumbcap and about midway between the shore of Mt. Desert Island and Porcupine Dry Ledge, which is to the westward of Bald Porcupine Island. When past Porcupine Dry Ledge steer a little more to the westward and anchor in 4 to 8 fathoms water, with the eastern end of Bar Island bearing about **N.**

Remarks.—Strangers standing along the eastern shore of Mt. Desert Island below Bar Harbor, should pass to the eastward of The Thrumbcap. There is a narrow channel between Bald Porcupine Island and Porcupine Dry

Ledge, but it should not be attempted by a stranger; the channel between Porcupine Dry Ledge and Mt. Desert Island has a depth of 7 to 11 fathoms.† Standing in to the anchorage the water will shoal rapidly, and attention should be paid to the anchorage buoys.

3. ***To enter Stave Island Harbor.***—Having come from the eastward and followed the directions in Section 1 until the southern end of Iron Bound Island is in range with the highest point of Grindstone Neck, bearing about **E.** by **S.**, steer **N.** by **E.** ¼ **E.** for the eastern end of Long Porcupine Island. When the northern end of Iron Bound Island is opened clear of the southern end of Jordan's Island steer **NE.**, so as to pass at least 300 yards to the westward of Yellow Island. Round the island, giving it a berth of 300 yards and steer about **E.**; anchor anywhere south of the southern end of Stave Island, in from 5½ to 7 fathoms water, soft bottom. There is a small shoal with 7 feet of water over it in the southeastern part of the harbor.

Or, having come from the southward or westward and followed the directions in Section 1 A or 1 B, until up to the whistling buoy off Great Head, steer **N.** by **E.** ¼ **E.** for the eastern end of Long Porcupine Island. When the northern end of Iron Bound Island is opened clear of the south end of Jordan's Island, steer **NE.** and follow the directions in the preceding paragraph.

Remarks.—The northern side of Egg Rock should be given a berth of nearly ½ mile. Iron Bound Island is bold-to and can be approached as close as 150 yards. When standing for the entrance to Stave Island Harbor, **Yellow Island**, a rocky islet, covered with trees, off the northwestern point of Jordan's Island, will be on the starboard bow. **Halibut Hole**, the passage between Iron Bound Island and Jordan's Island, has good water, with the exception of one small spot with 17 feet over it. **Jordan's Bar**, extending from the southeastern point of Jordan's Island to the mainland, has a narrow channel, with 8 feet of water across it, which is not used except by small local vessels.

4. ***To the entrance of Flanders Bay, between Stave Island and Calf Island.***—Having followed the directions in Section 1, 1 A, or 1 B, from a position ¼ mile **E.** of Bald Pocupine Island, steer **N.** by **W.** ½ **W.**, passing about midway between Burnt Porcupine Island on the east and Sheep Porcupine Island on the west. As soon as the steamboat wharf at Bar Harbor can be seen showing to the westward of Sheep Porcupine Island, steer **NE.** by **E.** a little over 3 miles for Calf Island Bar. The buoys marking the channel, when sighted on this course, will appear nearly in line, and very near together; the first one (spar, black, No. 1) leave close aboard on the port hand; then haul a little to northward and leave the next one (spar, red, No. 2) on the starboard hand; then steer **E.** by **N.** Half Tide Ledge buoy (spar, black, No. 3) will be in sight nearly ahead; leave it on the port hand and change course to **N.** ½ **E.** and steer for Hall's Point; when about ¼ mile from it anchor in about 6 fathoms. Or, when Hall's Point is a little over ¼ mile distant ahead, steer **NW.** ¾ **N.**; follow the shore of Ash's Neck and anchor ¼ mile **NW.** from Ash Point in 4 fathoms.

Remarks.—Vessels approaching the entrance should leave **Thrumbcap**, a small islet covered with trees, lying south of Calf Island, at least ¼ mile on the port hand. When abreast of Thrumbcap the buoys marking the channel, which is narrow, will be seen to the northeastward. Do not attempt to carry more than 10 feet draught over the bar at low water.

There is a clear and deep channel which leads into Flanders Bay between Preble and Calf islands, and around the northern end of the latter. Vessels entering with a southerly wind are liable to be becalmed under the north end of Calf Island.

Eastern Point Harbor is a small, well-protected anchorage north of the east end of Preble Island, between it and Waukeag Neck. The head of this harbor is shallow.

5. ***To an Anchorage in Sullivan Harbor.***—Having followed the directions in Section 1, 1 A, or 1 B, to a position ¼ mile **E.** from Bald Porcupine Island, steer **N.** by **W.** ½ **W.** and pass midway between Burnt Porcupine and Sheep Porcupine islands. When about ⅜ mile to the northward of the islands steer **N.**, heading between Bean's Island on the east and Crabtree Ledge light on the west. Pass to the eastward of Crabtree Ledge light; bring it to bear **S SW.** ¾ **W.** and steer **N NE.** ¾ **E.**; on this course leave Ingall's Ledge buoy (spar, red, No. 6) on the starboard hand and pass about midway between the two spindles above Mt. Desert Ferry. When between the spindles, steer **NE.** ½ **N.** until up to Moon Ledge buoy (spar, black, No. 1), which is left on the port hand; then haul a little more to the northward and anchor, favoring the northern shore, in 3½ to 7 fathoms water off the town of Sullivan.

Remarks.—On the **N.** course no dangers are encountered until up to Crabtree Ledge light, which should be left at least 100 yards on the port hand. The shoals making to the northward from Bean's Island are avoided by favoring the western shore. When above Mt. Desert Ferry the channel leads straight until past Moon Ledge buoy, where it turns to the westward.

† A breakwater is projected, to extend from Bald Porcupine Island to Mt. Desert Island, but in 1890 the channel to the westward of Porcupine Dry Ledge was still free from obstructions.

6. ***To an Anchorage in Skillings River.***— Having followed the directions in Section 1, 1 A, or 1 B., from a position ¼ mile to the eastward of Bald Porcupine Island, steer N. by W. ½ W.; pass midway between Burnt Porcupine and Sheep Porcupine islands; leave Bald Rock Ledge buoy (spar, black, No. 5) about ¼ mile on the port hand and stand into the entrance of the river between Crabtree Point on the east and Meadow Point on the west. Continue about 1½ miles above Crabtree Point and anchor in the channel in 6 to 8 fathoms. If bound farther up the river, a pilot should be obtained from South Hancock.

Remarks.— On the N. by W. ½ W. course Crabtree Neck will be a little on the starboard bow; the course leads about ⅝ mile to the eastward of **The Nub**, a bare rock at the eastern end of Bald Rock Ledge. The western shore of Crabtree Neck is bold-to and can be approached to 150 yards, with 6 to 10 fathoms water.

7. ***To an Anchorage in Eastern Bay, or, if bound to Jordan's River.***— Having followed the directions in Section 1, 1 A, or 1 B, from a position ¼ mile E. of Bald Porcupine Island, steer N. by W. ½ W., midway between Burnt and Sheep Porcupine islands, and when 1⅜ miles to the northward of them leave Bald Rock Ledge buoy (spar, black, No. 5) on the port hand. When this buoy bears SW. steer NW. ¼ N., and, having stood on this course about 2 miles, leave Sunken Ledge buoy (spar, black, No. 7) a little over ¼ mile on the port hand. Haul gradually to the westward and follow the shore of Mt. Desert Island, giving it a berth of ¼ of a mile. When abreast Googin's Ledge buoys and off Salisbury Cove anchor in 5½ to 7½ fathoms water, soft bottom. If bound to Jordan's River, take a pilot at Salisbury Cove or East Lamoine.

Remarks.— On the N. by W. ½ W. course The **Nub**, small, bare, rocky islet, will be left ⅝ mile on the port hand. On the NW. ¼ N. course, **Meadow Point**, the western point at entrance to Skilling's River, will be a little on the starboard bow. After passing Sunken Ledge buoy and standing into Eastern Bay, Googin's Ledge and the two red spar buoys marking its southern end should be ahead and gradually brought to bear on the starboard bow. **Salisbury Cove** and **Emery's Cove** are two small, shallow bights in the south shore to the southward of Googin's Ledge. The anchorage off Salisbury Cove is good for vessels of the heaviest draught.

SOUTH SHORE OF MT. DESERT ISLAND. †

Newport Cove is a small cove making in to the northward west of Great Head; it is not a good anchorage, being exposed to the southward, and the holding ground is poor. **Otter Cove** is a long, narrow cove making in to the northward west of Otter Creek Point; it is shallow at its head and is an exposed anchorage.

Seal Harbor or **Seal Cove** makes in to the south shore of Mt. Desert Island about 1⅜ miles east of Bear Island; it is not a good anchorage, having rocky bottom. **Bracy's Cove**, to the westward of Seal Harbor, is unfit for an anchorage. For descriptions of Southeast Harbor, Northeast Harbor, and Somes Sound, see respective headings.

Baker's Island and the **Cranberry Islands** lie from 1½ to 3 miles south of Mt. Desert Island, the waters north of them forming the eastern approach to Somes Sound and Southwest Harbor. They are of no commercial importance. **Baker's Island**, the southeasternmost of the group, is marked by **Baker's Island light-house** (see table of lights), and on the southeastern point of Little Cranberry Island is a **Life Saving Station**.

Cranberry (Islesford) Harbor is on the northern side of the islands between Little Cranberry and Great Cranberry islands; it is frequented by small local vessels, and coasting vessels sometimes anchor here, but Southwest Harbor is a much better anchorage.

Great Cranberry Island, the westernmost of the group, is about ⅝ of a mile from the shore of Mt. Desert Island; on its western side is a narrow channel with a depth of 14 feet, forming the southern and western approach to Somes Sound and Southwest Harbor.

The **Gott Islands** lie about ⅞ mile south of Bass Harbor Head; a bar with a greatest depth of 12 feet over it at low water extends from Great Gotts Island, the northernmost of the two, to Bass Harbor Head. The best water is nearer Bass Harbor Head.

Great and **Little Duck Islands** lie from 3½ to 5 miles to the southward of Great Cranberry Island and have deep water all around them; they should be given a berth of ¼ mile. On the southern end of Great Duck Island is the light-house and fog-signal (see table of lights, page 16).

Black Island is a large island about ⅝ mile to the southward of Little Gotts Island. **Placentia Island** lies about ⅝ mile to the westward of Little Gotts Island. A good channel leads between these islands, but a stranger should not use it unless obliged to.

SOUTHWEST HARBOR. †

This is the most important harbor on the south side of Mt. Desert Island; it has an excellent, well sheltered anchorage in 12 to 36 feet of water, and can be entered from the eastward by vessels of the heaviest draught. There are

† Shown on Coast and Geodetic Survey charts: **306, 307, 308, 292**, scale of each $\frac{1}{40,000}$, price of each $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50.

two approaches, the one from the eastward leading between the south shore of Mt. Desert Island and the Cranberry islands, and the one from the southward leading between the shore of Mt. Desert Island and the west shore of Great Cranberry Island over Cranberry Island Bar. Somes Sound makes to the northward from Greening's Island, which lies on the north side of the entrance to Southwest Harbor. The village of **Southwest Harbor** is one of the summer resorts on Mt. Desert Island, and several large hotels are situated near the shores of the harbor. It has telegraphic and telephone communication with the mainland, and the steamboats of several lines stop here. The steamboat wharf has 9 feet at low water. Freeman's wharf has 5 feet; the other wharves are dry at low water.

Prominent objects.—Approaching from the eastward **Baker's Island light-house** (see table of lights page 16) will be seen to the southeastward of the Cranberry islands. The **stone beacon** on East Bunker's Ledge is nearly midway between Little Cranberry Island and Mt. Desert Island. **Sutton's Island** lies west of East Bunker's Ledge beacon and in the middle of the channel. **Bear Island**, north of the western end of Sutton's Island, is small and high with a white light-tower on its western end.

Channels.—The approach from the eastward is somewhat obstructed by ledges and islands, but the most dangerous are marked by beacons and bouys; **Bear Island light** is the aid for approaching from the eastward. No difficulty should be experienced in entering in the daytime or on a clear night. The least depth in the channel north of Sutton's Island is about 7½ fathoms.

Approaching from the southward the channel crosses Cranberry Island Bar, which has 14 feet at low water. Two ledges contract the channel south of the bar to a width of about 250 yards, where it is marked by buoys. **South Bunker's Ledge** lies about in the middle of the approach and is marked by a spindle. There is frequently a swell on the bar; if so, vessels of over 11 feet draught must wait for a rising tide before crossing.

The best anchorage is south of the steamboat wharf on the north side of the harbor; light-draught vessels stand farther in, but the water shoals gradually to the westward of the wharf, and there are several shoal, rocky spots near the head of the harbor.

Pilots.—In the daytime, with clear weather, a pilot is not required to enter from the eastward. Strangers coming from the westward and crossing Bass Harbor and Cranberry Island bars can take a pilot at Bass Harbor, if desired. Pilots for the waters to the eastward and westward can generally be found at Southwest Harbor by making inquiries on shore.

Supplies.—Anthracite coal, in limited quantities, can be had alongside the wharves. Water, provisions, and ship chandler's stores can be obtained.

Ice does not interfere with navigation except during the most severe winters, and then only for a short time.

Tides.—The mean rise and fall of tides is 10.1 feet (see also table, page 15).

SAILING DIRECTIONS, SOUTHWEST HARBOR

1. ***Approaching from the Eastward.***—I. ***From the whistling buoy off Schoodic Island*** steer **W.** ¼ **S.** When Baker's Island light bears about **S.** and Bear Island light bears **NW.** by **W.** ¼ **W.**, steer for the latter and proceed as directed in par's. I or II, Section 2, following.

II. ***From the whistling buoy off Baker's Island*** steer **N.** ½ **W.**, leaving Harding's Ledge buoy (spar, black, No. 1) ½ mile on the port hand. When Bear Island light bears **NW.** by **W.** ¼ **W.** steer for it and proceed as in par's. I or II, Section 2, following.

III. ***From Frenchman's Bay.***—Steer to bring Egg Rock light bearing **NE.**, distant not less than 1 mile, then steer **SW.** until Bear Island light bears **NW.** by **W.** ¼ **W.**, then proceed as in par's. I or II, Section 2, following.

Or, if wishing to pass to the northward of East Bunker's Ledge, when on the **SW.** course and Otter Cliff bell-buoy bears **NW.**, distant about ⅜ mile, steer **W.** by **S.**; and when Lewis Rock buoy (spar, black, No. 3) is abeam, distant 200 or 300 yards, and in range with East Bunker's Ledge Beacon, proceed as directed in par. III, Section 2, following.

Remarks.—On the **N.** ½ **W.** course from Baker's Island whistling buoy, a **Life Saving Station** on the southeast end of Little Cranberry Island will show prominently on the port hand. Harding's Ledge buoy (spar, black, No. 1) will be left about ½ mile on the port hand, and it will be cleared when Egg Rock light bears **NE.**

Coming from Frenchman's Bay, Otter Cliff bell-buoy (black) will be left about ⅜ mile on the starboard hand. Passing to the northward of East Bunker's Ledge, Lewis Rock buoy (spar, black, No. 3) will be 200 yards on the port hand when in range with East Bunker's Ledge beacon.

Cod Ledge, with a least depth of 10 fathoms on it, lies about **NE.** by **E.**, distant 3¾ miles from Baker's Island light-house.

Dangers.—There are no dangers on the **W.** ¼ **S.** course from Schoodic whistling buoy until up to **East Bunker's Ledge**, a shoal, with bare, rocky ledges on it, about ¼ mile long in a **N NE.** and **S SW.** direction. It is marked by a white, square, stone beacon, on the southernmost of the ledges, which lies about 1 mile from the eastern end of Sutton's Island and 2½ miles **N.** ¾ **W.** from Baker's Island light-house. Coming from the eastward it will be difficult to distinguish the beacon until within about 2 miles of it unless it faces the sun.

Entrance to Southwest Harbor from the Southward and Westward, Baker Id. Lt.Ho. bearing NE by E.½ E. distant 3¼ Miles.

Entrance to Bass Harbor from between Duck and Gotts Islands, the Lt.Ho. bearing N.N.W.½ W. distant 4¼ Miles.

Harding's Ledge, a rocky shoal making out about ¼ mile to the eastward from Little Cranberry Island, is marked on its eastern end by a buoy (spar, black, No. 1) which lies 1¼ miles **N.** from Baker's Island light-house.

Otter Cliff Ledge, a rocky shoal, bare at low water, about ¼ mile **SE.** from Otter Cliff, is marked by a black bell-buoy, lying ⅛ mile **SE.** from the ledge and 2¼ miles **NE.** by **E.** ¾ **E.** from East Bunker's Ledge beacon.

Lewis Rock, ¼ mile **N.** from East Bunker's Ledge beacon, is a small rocky spot with 6 feet of water over it, marked on its northern side by a buoy (spar, black, No. 3).

2. *Entering from the Eastward.*—I. With Baker's Island light bearing about **S.** and Bear Island light **NW.** by **W.** ¼ **W.**, East Bunker's Ledge beacon will bear about **N NW.**, distant about ⅝ mile; steer for Bear Island light, and when Long Pond Shoal buoy (spar, red, No. 6) bears **N.**, distant about 300 yards, steer about **W.** so as to pass 100 to 200 yards to the southward of Southeast Point Greening's Island buoy (spar, red, No. 6), and then steer about **W.** by **N.** and anchor **S.** of the steamboat wharf on the northern side of the harbor.

II. Or, if wishing to pass to the southward of Sutton's Island, with East Bunker's Ledge beacon bearing **N NW.**, distant ⅝ miles, steer **W.** ½ **N.** so as to pass about 100 yards to the northward of Sperlin's Rock buoy (spar, red, No. 2), and when abreast of it, steer **NW.** by **W.** ¾ **W.** for the entrance of the harbor and anchor as directed in par. I. Do not use this passage at night.

III. With East Bunker's Ledge beacon bearing **S.**, distant ⅜ mile, steer **W.** ¼ **N.**, passing between Bear Island and Sutton's Island, and when Southeast Point Greening's Island buoy (spar, red, No. 6) bears **N.**, distant 150 to 200 yards, steer **W.** and anchor as directed in par. I.

Remarks.—At night the passage to the northward of Sutton's Island is the one generally used. On the **NW.** by **W.** ¼ **W.** course do not allow Bear Island light to fall anything to the westward of this bearing until ½ mile beyond the point where Otter Cliff (Mt. Desert Island) closes in Egg Rock light; this will clear East Bunker's Ledge.

Sutton's Island is comparatively bold-to, and may be approached to about 250 yards. There is a passage with 15 feet of water between Greening's Island and Clarkes Point, which is used by coasters and small steamers going into Somes Sound. The channel is marked by Greening's Ledge buoy (spar, red, No. 8) off the **SW.** end of Greening's Island and a buoy (spar, black, No. 5) on the bar, marking a 1-foot spot. The northern end of the shoal to the north of Greening's Island is marked by a buoy (spar, red and black horizontal stripes), which should be left on the starboard hand by vessels bound into Somes Sound from Southwest Harbor.

Dangers.—A sunken ledge with 4 feet of water on it makes out to the southward from the east point at entrance to Seal Harbor. It is marked on its southern end by a buoy (spar, red, No. 2) lying about ½ mile **N NW.** from East Bunker's Ledge beacon. It should be left about 150 yards on the starboard hand entering from Frenchman's Bay.

Bowden's Ledge, lying 1¼ miles **E.** by **S.** from Bear Island light-house, is a rocky shoal with 2 feet of water on it, lying about 300 yards from Mt. Desert Island. It is marked on its southern edge by a buoy (red, spar, No. 4), which should be left on the starboard hand when entering.

Long Pond Shoal is a rocky shoal with 5 feet of water on it, marked by a buoy (red, spar, No. 6) lying ⅝ mile **E SE.** ½ **E.** from Bear Island light-house. Forming a part of the same shoal is a 14½-foot spot about 400 yards to the eastward of the buoy.

Sperlin Rock is a 7-foot rocky spot about midway between Sutton's Island and Great Cranberry Island. It is marked about 50 feet from its northern side by a buoy (spar, red, No. 2) lying 1¾ miles **W SW.** ½ **W.** from East Bunker's Ledge beacon, and is left about 50 yards on the port hand when entering Southwest Harbor.

Greening's Island, lying on the north side of the entrance to the harbor, has shoals making out 200 to 350 yards from it on all sides. It is marked off its southeast end by a buoy (spar, red, No. 6), and off its southwest end (**Greening's Ledge**) by a buoy (spar, red, No. 8), which is also a guide to the passage between Greening's Island and Clarkes Point.

1 A. *Approaching and Entering.*—***From the westward and passing south of Long Island.***—I. Shape the course so as to pass about 1 mile south of Long Island Head, the southeastern end of Long Island, and when it bears **N.** steer **NE.** for 3 miles until Great Duck Island light bears **E.** ½ **S.**, distant about 2 miles, then steer **N.** by **E.** ¼ **E.** for Long Ledge black bell-buoy. Leave it on the port hand and steer about **NE.** ½ **N.** for the Fairway buoy (nun, white and black perpendicular stripes). Leave the Fairway buoy on either hand and haul to the eastward, passing midway between Cranberry Island Ledge buoy (spar, red, No. 2) and Flynn's Ledge buoy (spar, black, No. 3). When about 200 yards beyond the black buoy change course to **N.** ½ **E.**, and when off the entrance to Southwest Harbor haul to the westward and anchor as directed in Section 2, foregoing.

Or, when about 1 mile south of Long Island Head steer **NE.** so as to pass about ½ mile to the northwestward of Little Duck Island. When the northwestern end of Little Duck Island bears **SE.** steer **E NE.** ⅜ **E.** for the whistling buoy off Baker's Island, and when up to it follow the directions given in Sections 1 and 2, foregoing.

II. ***Coming from Blue Hill Bay.***—Steer so as to pass from 250 to 350 yards to the southward of Bass Harbor light, and when across Bass Harbor Bar steer **E SE. ½ E.** for Long Ledge bell-buoy; pass to the southward of it and steer **NE. ½ N.** for the Fairway buoy, and follow the foregoing directions for entering Southwest Harbor from the westward.

Remarks.—Long Island Head is bold-to but should not be approached closer than ½ mile in stormy weather, as a very heavy sea breaks on it.

On the **N.** by **E.** ¼ **E.** course the Duck Islands will be left about 2 miles on the starboard hand and Great Gotts Island ⅞ mile on the port hand.

The **N.** ½ **E.** course across the Cranberry Island Bar leads about midway between High Head and Sea Wall Point for the eastern end of Greening's Island.

There is 12 feet of water on Bass Harbor Bar, and frequently a heavy swell; vessels of 10 feet draught should not attempt it at low water.

Dangers.—**The Drums,** lying 2¼ miles **NE.** ½ **N.** from Long Island Head, is a ledge showing bare at low water, and marked off its southeastern end by a buoy (spar, black, No. 1).

Horse Shoe Ledge is a large unmarked rocky ledge, bare at low water, lying 1 mile **N.** ¾ **E.** from The Drums buoy. The **N.** by **E.** ¼ **E.** course, if made good, leads ⅝ mile to the eastward of it.

The Nubble is a very dangerous reef, mostly bare at low water, and with a few detached rocks showing at high water; it makes out ½ mile in a southeasterly direction from Mt. Desert Island, about 1½ miles **E.** from Bass Harbor Head light-house. Off its end is Long Ledge black bell-buoy, which should be left on the port hand when standing in for Southwest Harbor.

South Bunker's Ledge is a detached ledge about 400 yards in diameter, and lies **W.** ¼ **N.** about 3¾ miles from Baker's Island light-house and about 2⅝ miles **E.** by **S.** from Bass Harbor Head light-house. It shows partly bare at half tide and is marked by a spindle (iron, red, cage on top) near the middle of the ledge.

Cranberry Ledge is a rocky shoal, with 4 feet of water on it, making out in a westerly direction from the **SW.** end of Great Cranberry Island. It is marked on its end by a buoy (spar, red, No. 2).

Flynn's Ledge, with 5 feet of water on it, makes out **S SE.** ½ **E.** ½ mile from Sea Wall Point (Flynn's Point) and is marked on its end by a buoy (spar, black, No. 3).

Cow Ledge is a rocky shoal with a spot bare at low water making out about ¼ mile to the westward from Sperlin's Point. It is marked off its western end by a buoy (spar, red, No. 4).

NORTHEAST HARBOR†

is an excellent anchorage for small vessels; its entrance is **N NW.** from Bear Island. The head of the harbor is shoal, but good anchorage in 19 feet of water, with soft bottom, will be found in mid channel inside the entrance. There are several large summer hotels on the shores of the harbor, and on the western side, inside the entrance, is the steamboat wharf, at which there is 8 feet at low water. Fresh water can be obtained here.

SAILING DIRECTIONS, NORTHEAST HARBOR.

1. ***From the Eastward.***—Follow the directions for approaching and entering Southwest Harbor (Sections 1 and 2, pages 62–63), and when Long Pond Shoal buoy (spar, red, No. 6) bears **N.**, distant about 300 yards, steer **W.** by **N.**, passing about 400 yards to the southward of Bear Island light, and when it bears **NE.** steer **N.** by **W.** Leave Northeast Harbor Ledge buoy (spar red, No. 10) close-to on the starboard hand, and steer **N.**; pass midway between the shores at the entrance; anchor in mid channel just above the wharf.

2. ***From the Westward.***—Follow the directions for approaching Southwest Harbor, Section 1A, page 63; when across Cranberry Island Bar, and Cow Ledge buoy is off the starboard beam, steer **N NE.** ¼ **E.**, and when up to Northeast Harbor Ledge buoy, leave it on the starboard hand and proceed as directed in Section 1, preceding.

Remarks.—For remarks and dangers approaching Northeast Harbor, see remarks and dangers under Sections 1 and 2, Approaching and Entering Southwest Harbor from the Eastward, and Section 1 A from the westward.

Dangers.—Bear Island has shoals making out 200 yards to the southward, and also to the northward, joining it to Mt. Desert Island.

Northeast Harbor Ledge is a rocky shoal, bare at low water, lying fair in the entrance to Northeast Harbor. It is marked on its western side by a red spar buoy, No. 10, lying 600 yards **NW.** ½ **W.** from Bear Island light-house. There is deep water on all sides of the ledge, but the best passage into the harbor is to the westward of it.

SOMES SOUND.‡

This is a narrow body of water, about 4½ miles long and ¼ to ⅜ mile wide, making into the south shore of Mt. Desert Island in a **N.** by **E.** direction. It lies between steep rocky shores, and has a narrow entrance with few

†Shown on Coast and Geodetic Survey charts: **306, 292,** scale of each $\frac{1}{40,000}$, price of each $0.25; and **103,** scale $\frac{1}{80,000}$, price $0.50.

‡Shown on Coast and Geodetic Survey charts: **306, 307, 292,** scale of each $\frac{1}{40,000}$, price of each $0.25; and **103,** scale $\frac{1}{80,000}$, price $0.50.

dangers. Somes Sound is not used as an anchorage by vessels seeking shelter, on account of its great depth and narrow entrance. Sailing vessels should enter under easy canvass, on account of the heavy squalls of wind which occasionally strike down from the mountains. Greening's Island lies in the middle of the approach, with a channel on either side of it. The eastern channel is the wider, and has a least depth of 8½ fathoms; the western channel has a depth of 15 feet, and is very narrow.

Somes Harbor, in the northwestern side, at the head of the sound, is a small cove, shallow on its western side and at its head. The village of **Somesville** is on the west shore of the harbor. The heaviest draught entering the sound is 17 feet. There is 10 feet at low water alongside the wharves. During the summer a small steamer runs to Southwest Harbor from Somesville. The channel in the entrance off Manchester Point is only 200 yards wide between the 18-foot curves; above the point it widens.

Prominent features.—Bear Island light-house (see table of lights, page 16) is the most prominent guide to the approach from the eastward. **Manchester Point**, the eastern point at the entrance, is comparatively low and grassy, with several summer houses near its end. The western point at the entrance is high and thickly wooded, except near the water, where it slopes gradually and is bare of trees. The western shore, above Manchester Point and up to Robinson's Mountain is high and bold-to; above this it is somewhat lower, and has a number of granite quarries.

Pilots.—Strangers bound into Somes Sound generally take a pilot at Southwest Harbor.

SAILING DIRECTIONS, SOMES SOUND.

1. ***Approaching and Entering.—From the Eastward, passing north of Sutton's Island.***—Follow the directions for approaching and entering Southwest Harbor, pages 62–63, until Bear Island light bears **N.**, distant about 500 yards; then steer about **NW.** by **W.** ¾ **W.** for the northern end of Greening's Island.

When the western point at entrance to Gilpatrick Cove bears **N NE.** ¼ **E.**, steer **N.** by **W.** ¾ **W.** so as to leave Manchester Point about 150 yards on the starboard hand. As soon as the southwestern end of the point is abeam, steer **N.** ¾ **E.** for the high-water mark of Robinson's Mountain, on the western shore about 1¾ miles above Manchester Point. When nearly up to Robinson's Mountain follow a mid-channel course up the sound.

If bound to Somesville, follow the western shore above Robinson's Mountain, giving it a berth of at least 200 yards, and when up to Myrtle Ledge buoy (spar, red, No. 2) leave it about 100 yards on the starboard hand and steer **N.** Leave Bar Ledge buoy (spar, black, No. 1) 30 yards on the port hand and continue the **N.** course past Mason's Ledge buoy (spar, black, No. 3), which should be left on the port hand. Anchor just above this buoy in 3½ fathoms water, soft bottom.

See the remarks and dangers under Section 1 B, following.

1 A. ***Approaching and Entering.—From the Westward, crossing Cranberry Island Bar.***—Follow the directions for approaching and entering Southwest Harbor, pages 63–64, and when across Cranberry Island Bar and nearly up to Cow Ledge buoy (spar, red, No. 4) steer **N.** by **E.** so as to pass about 300 yards to the eastward of Greening's Island. When Bear Island light bears **E.**, steer **NW.** ½ **N.** until the west point at entrance to Gilpatrick Cove bears **N NE.** ¼ **E.**, then proceed as directed in Section 1, preceding.

See the remarks and dangers under Section 1 B, following.

1 B. ***Approaching and Entering.—From Southwest Harbor, passing west of Greening's Island.***—Pass about 150 yards to the westward of Greening's Ledge buoy (spar, red, No. 8) and steer about **N NE.**; leave Clark's Point buoy (spar, black, No. 5) close-to on the port hand and continue the **N NE.** course for the western side of Manchester Point. Pass 150 yards to the westward of the point and steer **N.** ¾ **E.** for the high-water mark of Robinson's Mountain; then follow the directions in Section 1, preceding.

Remarks.—When passing to the northward of Greening's Island, care should be taken to keep clear of Gilpatrick Ledge, which lies ½ mile to the westward of Northeast Harbor. The northern shore of Greening's Island should be given a berth of 300 yards. When standing for the entrance to the sound, Middle Rock is avoided by keeping well over toward Manchester Point. For a distance of 1¼ miles above the point the eastern shore of the sound should not be approached closer than 400 yards; above this the shore is comparatively bold until up to Sargent's Point.

The channel up to Somesville, to the westward of Bar Island, is very narrow, and should only be entered by sailing vessels with a fair wind.

Dangers.—**Gilpatrick Ledge**, an unmarked ledge, barely covered at high water, makes out 300 yards to the southward at the eastern side of the entrance to Gilpatrick Cove. It should be left about 250 yards on the starboard hand.

Greening's Island has shoals making out about 200 yards from its northern shore. The extreme northern point is marked by a buoy (spar, red and black horizontal stripes).

Middle Rock is an unmarked rock with 13½ feet of water on it, lying on the western side of the entrance to Somes Sound and ½ mile N. ¼ W. from North Point Greening's Island buoy. It can be avoided by favoring Manchester Point, giving it a berth of 100 to 200 yards.

Greening's Ledge, on the southwest side of Greening's Island, is marked by red spar buoy No. 8.

A 1-foot rock on the western side of the channel near the bar between Greening's Island and Clark's Point is marked by a black spar buoy, No. 5, which should be left close-to on the port hand leaving Southwest Harbor.

BASS HARBOR.†

This harbor, on the southwestern side of Mt. Desert Island, is much frequented by vessels bound through the inland passages. It affords good anchorage for a limited number of vessels, in 12 to 24 feet of water, in the channel of the inner harbor; the outer harbor is exposed to southerly winds and has a depth of 4 to 7½ fathoms. The ledge at the entrance and other prominent dangers in the outer harbor are buoyed. A small village and fish canning establishment are situated on the western shore of the inner harbor.

Prominent Objects.—**Bass Harbor Head light-house** (see table of lights, page 16), on the eastern point at entrance, is the most prominent mark approaching the harbor.

Channels.—The approach from the eastward is across Bass Harbor Bar, which has 12 feet of water over it. The approach from the westward through Blue Hill Bay is clear of all dangers. Entering the harbor a good channel leads on both sides of Weaver's Ledge up to Harbor Point at the entrance to the inner harbor; above this it is narrow and winding, gradually decreasing in depth toward the head.

Anchorages.—The anchorage in the outer harbor is a little over ¼ mile to the northward of Weaver's Ledge, in 20 to 45 feet of water. A limited anchorage will be found about 200 yards inside of Harbor Point Ledge buoy (spar, black, No. 5).

Pilots are not necessary for entering the outer harbor; they can be obtained at Bass Harbor for the waters to the eastward and westward by making signal while outside, or anchoring in the outer harbor.

Ice seldom prevents vessels entering the outer harbor.

Tides.—The mean rise and fall of tides is 10 feet; see also table, page 15.

SAILING DIRECTIONS.—BASS HARBOR.

1. ***Approaching and Entering.—From the Eastward, crossing Bass Harbor Bar.***—From Baker's Island whistling buoy steer **W NW.** ⅞ **W.** for Bass Harbor Bar, passing close to the southward of Long Ledge bell-buoy, and from 250 to 350 yards to the southward of Bass Harbor light-house. When across the bar, and the light bears **NE.**, steer **N.** by **W.** ½ **W.**, favoring the eastern shore, and anchor about ¼ mile to the northward of Weaver's Ledge.

Remarks.—As there is frequently a heavy swell on Bass Harbor Bar, vessels of 10 feet draught should not attempt to cross it at low water. Strangers should not attempt to proceed above Harbor Point into the inner harbor without a pilot.

Dangers.—**The Thumper** is an unmarked rocky ledge, showing bare at low water, lying 200 yards south of Baker's Island. It and an unmarked shoal bare at low water ⅝ mile **SW.** from Baker's Island, will be left about ½ to ⅝ mile on the starboard hand, on the **N NW.** ⅞ **W.** course.

South Bunker's Ledge will be left at least ¼ mile on the starboard hand, and Long Ledge bell-buoy marking **The Nubble** will be passed close-to. For description of these dangers see "Dangers," under Section 1 A (page 64).

Weaver's Ledge is a rocky spot, bare at low water, lying midway of the entrance to Bass Harbor. It is marked on its eastern side by a buoy (spar, black, No. 1), and on the western side by a buoy (spar, red, No. 2). The buoys may be passed close-to on their respective sides.

1 A. ***Approaching and Entering.—From the Eastward, for heavy draught.***—From Baker's Island whistling buoy steer **W.** by **S.** about 8½ miles, passing about ⅜ mile south of Black Island, and the same distance north of Drum and Green islands. When the westernmost of the Green Islands bears **SE.** by **S.**, steer **NW.** by **N.** passing about ⅜ mile to the westward of Black Island and about 400 yards to the westward of Placentia Island. When the western end of the latter bears **E.** steer **NE.** ¾ **N.** Pass about midway between Lopau's Point and Weaver's Ledge buoy (spar, red, No. 2), and anchor about ¼ mile to the northeastward of the buoy in 4 to 7 fathoms water, soft bottom.

† Shown on Coast and Geodetic Survey charts: **307, 308, 292,** scale of each $\frac{1}{40,000}$, price of each $0.25; and **103,** scale $\frac{1}{80,000}$, price $0.50.

Remarks.—On the **W.** by **S.** course Little Duck Island is left a little over 1 mile on the port hand; Black Island will be a little on the starboard bow and **Drum Island** and **Green Islands**, a group of small bare islands, will be on the port bow. When passing Black Island, Placentia Island will be opened on the starboard beam to the northward, The **NW.** by **N.** course leads to the westward of Black and Placentia islands, with the westernmost Green Island astern. On the **NE.** ¾ **N.** course Lopau's Point will be a little on the port bow and Bass Harbor Head light will be well on the starboard bow. The northern side of Placentia Island is bold-to and can be approached as close as 150 yards. The best anchorage is to the southward of Bass Harbor Ledge buoy (spar, black, No. 3).

Dangers.—**Horse Shoe Ledge** is about 500 yards long **N.** and **S.** and shows partly bare at low water; it lies ¾ mile **E.** ½ **S.** from Drum Island and about 3 miles **W.** from the northern end of Little Duck Island. The ledge is left nearly ½ mile on the port hand when on the **W.** by **S.** course.

Grindstone Ledge, a bare rocky ledge, is about 300 yards from the southeastern end of Black Island. There is no passage for vessels between the ledge and island.

Drum Island, a bare rocky islet, lies nearly ¾ mile **S SE.** from the southeastern end of Black Island; it is comparatively bold-to and can be approached to 150 yards. The **Green Islands** are just to the westward of Drum Island and should be given a berth of 400 yards.

Staples Ledge is described under Section 1 B, following, and Weaver's Ledge under Section 1, preceding.

1 B. ***Approaching and Entering.—From the Southward.***—From a position about 1 mile to the westward of SW. Point, the southwestern end of Long Island, steer **N.** by **E.** ¾ **E.**, heading for Ram Island, passing about midway between Long Island and John's Island, and the Sister Islands and Burnt Coat Island. When Ram Island is ¼ mile distant ahead steer **NE.** by **E.** ½ **E.**, passing midway between it and the Sister Islands. When the easternmost of the Sister Islands bears **S SW.** steer **N.**, and when the western end of Placentia Island bears **E.**, distant 400 to 500 yards, steer **NE.** ¾ **E.** Pass about midway between Lopau's Point and Weaver's Ledge buoy (spar, red, No. 2) and anchor as directed in Section 1 A, foregoing.

Directions for approaching Bass Harbor from the westward, having come through Casco Passage, are given in treating of that passage.

Remarks.—On the **N.** by **E.** ¾ **E.** course **East Point**, the eastern point of Burnt Coat Island, will be open a little to the westward of the Sister Islands. John's Island Ledge buoy (nun, red, No. 2) should be left about ¾ mile on the port hand. **John's Island**, showing a bare rocky shore line and covered with a scrubby growth of trees, should be left about ½ mile on the port hand. **Ram Island** is a rocky islet lying about ¼ mile from the shore of Burnt Coat Island and about ½ mile to the northwestward of the westernmost of the Sister Islands. On the **NE.** by **E.** ½ **E.** course East Point should be given a berth of at least ¼ mile when to the eastward of it. Placentia Island is bold-to on its western side and can be approached as close as 100 yards.

Dangers.—**John's Island Sunken Ledge**, with 6 feet of water on it, is marked by a buoy (nun, red, No. 2) which is about 100 feet southwest from shoal part of ledge and lies ¾ mile **S.** by **W.** from John's Island, and 1¾ miles **W.** by **S.** from SW. Point.

Beach Ledge, unmarked rocky spots with 14 and 16 feet of water on them, lies ¾ mile **NW.** by **N.** from SW. Point, and about ½ mile from the shore of Long Island; it should be left about ½ mile on the starboard hand when on the **N.** by **E.** ¾ **E.** course.

An unmarked ledge with 16 feet of water on it lies ¼ mile **E NE.** from East Point (the eastern end of Burnt Coat Island) and should be left from ¼ to ⅜ mile on the port hand on the **N.** course.

Staples Ledge, bare at low water, is marked on its southeastern side by a buoy (spar, red and black horizontal stripes) lying 1 mile **W NW.** from the southwestern end of Placentia Island. The buoy should be given a berth of 200 yards.

Weaver's Ledge is described under Section 1, foregoing.

BURNT COAT HARBOR. †

This is a small, well-sheltered anchorage on the southwestern side of **Burnt Coat (Swan's) Island**, much used by fishermen as a harbor of refuge, but seldom by other vessels. The anchorage to the eastward of the light-house is about 500 yards wide, with a depth of 3½ to 6 fathoms, soft bottom. There is also good anchorage in the channel north of the light-house for smaller vessels in 13 to 24 feet of water. The western point at the entrance is marked by **Burnt Coat Harbor light-house** and an unused light tower (see table of lights, page 16). To the southward and westward of Burnt Coat Island are numerous islands, rocks, and ledges, between which two good channels lead to the harbor entrance, which is about 150 yards wide. The approach from the eastward is south of the islands and ledges lying between Long and Burnt Coat islands; from the westward it is south of the islands and ledges lying to the southward and southeastward of Isle au Haut and Marshall Island. The harbor is entered from Jericho Bay through the passage between Marshall Island and Hat Island.

The village of **Swan's Island** is on the shore of the harbor. Supplies for fishermen can be obtained here.

† Shown on Coast and Geodetic Survey charts: **308**, scale $\frac{1}{40,000}$, price $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50.

SAILING DIRECTIONS, BURNT COAT HARBOR.

1. ***Approaching and Entering.—From the Eastward.***—Shape the course so as to pass about ½ mile south of Long Island Head and then steer **W.** by **N.** until John's Island Ledge buoy (nun, red, No. 2) bears **NE.**, distant about ½ mile, then steer **NW.** ¾ **N.** so as to pass about midway between Green and Brimstone islands; and when Burnt Coat Harbor light bears **NE.** steer for it.

At night continue the **W.** by **N.** course from Long Island Head about 3¾ miles, and then steer **NW.** until Burnt Coat Harbor light bears **NE.** by **N.**, then steer for the light until Brimstone Island is abaft the port beam; then bring the light to bear **NE.** and steer for it.

When about 250 yards from the light-house steer about **E.** by **N.** and pass about 150 yards south of and midway between it and Harbor Island Ledge spindle (red, with wheel on top).

Anchor to the eastward or northeastward of the light-house but not more than ¼ mile from it.

Remarks.—**Long Island Head**, the southeastern point of Long Island, shows prominently and is bold-to. On the **W.** by **N.** course John's Island Dry Ledge will be well on the starboard bow and is left ½ mile on the starboard hand.

When on the **NW.** ¾ **N.** course, Green Island will be on the starboard and Brimstone Island on the port bow. **Hat Island** will be a little on the starboard bow; it lies about ¼ mile off the southwestern end of Burnt Coat Island, is about 100 feet high, and covered with trees, except on its top which shows bare in places. The western shore of Harbor Island should be given a berth of 125 yards or more.

Dangers.—**John's Island Dry Ledge** lies 2 miles **W NW.** from **SW.** point of Long Island and ½ mile **SW.** from John's Island. It shows very prominently at low water.

John's Island Sunken Ledge, with 6 feet of water over it, lies ⅝ mile **SE.** from John's Island Dry Ledge, and is marked by John's Island Ledge buoy (nun, red, No. 2).

Sally Prude's Ledge, a small spot with 9 feet over it, lies about ⅛ mile **NW.** from John's Island Dry Ledge.

The Bull (Gooseberry Island Ledge), on the northwestern side of the entrance, is partly bare at low water, and its southern end is marked by a buoy (spar, black, No. 3) which lies about ½ mile **W SW.** from the light-house.

Gooseberry Island lies about ⅝ mile **W.** from the light-house, and ¼ mile to the westward of that island is **High Sheriff**, a small bare rock. Between these two islands there is a ledge partly bare at low water called **Sheriff Ledge.** These are all left on the port hand in approaching the harbor.

Seal Ledge, having 12 feet of water over it, lies ½ mile **E.** from Black Ledge, the low barren islet 1¼ miles **SW.** by **W.** from Heron Island; it is marked by a buoy (spar, black, No. 1) lying ¼ mile to the eastward of the ledge.

1 A. ***Approaching and Entering.—From the Westward.***—Pass about ¾ mile south of the spindle on Roaring Bull Ledge, south of Isle au Haut, and when the spindle bears **N.**, steer **E.** ⅞ **N.** about 3¼ miles; then steer **NE.** by **E.** until Burnt Coat Harbor light bears **NE.** by **N.**; steer for the light on this bearing until Brimstone Island is passed, then haul to the northward until the light bears **NE.** and steer for it again. When the light-house is about 250 yards distant, steer about **E.** by **N.** and anchor as directed in Section 1, preceding.

Remarks.—The **E.** ⅞ **N.** course leads about ¾ mile south of Eastern Ear and Cold ledges. On the **NE.** by **E.** course Black Ledge and Heron Island will be on the port bow. When Black Ledge is abeam, distant about ¾ mile, Seal Ledge buoy (spar, black, No. 1) should be made on the port bow. On the **NE.** by **N.** course this buoy is left about 300 yards on the port hand and Heron and Brimstone islands are left about ¼ mile on the port hand. On the **NE.** course for the light-house the western shore of Harbor Island will be left about 175 yards on the starboard hand.

Dangers.—**Eastern Ear Ledge** and **Cold Ledge** are described on page 23.

Seal Ledge and other dangers adjacent the sailing line are described under Section 1, preceding.

1 B. ***Approaching and Entering.—From Jericho Bay.***—Having come through Eggemoggin Reach, Deer Island Thoroughfare, or Merchant's Row (see sailing directions under those headings), when midway between Halibut Rocks and Hat Island steer **SE.** by **E.** until Burnt Coat Harbor light bears **NE.**, then steer for the light until it is about 250 yards distant and steer **E.** by **N.** Anchor as directed in Section 1, preceding.

Remarks.—On the **SE.** by **E.** course High Sheriff and Gooseberry islands will be on the port bow and should be left about ¼ mile on the port hand. Gooseberry Island Ledge buoy (spar, black, No. 3) should be seen to the southeastward of Gooseberry Island; it is left on the port hand when entering the harbor.

Dangers.—**Hat Island Ledge** makes out ¼ mile to the westward from Hat Island and is marked near its end by a buoy (spar, red, No. 2) which is left on the port hand when coming from the westward. About ¼ mile **SW.** from the middle of Hat Island are two small 14-foot spots.

A Shoal with 10 to 14 feet of water over it makes out ⅝ mile to the northward from the northern end of Marshall's Island. This can be avoided by keeping the northern end of the Halibut Rocks bearing to the westward of **W NW.** ¼ **W.** until the western end of Hat Island bears to the northward of **N NE.**

The dangers immediately to the westward of Burnt Coat Harbor entrance are described under Section 1, preceding.

BLUE HILL BAY †

lies west of Mt. Desert Island; it is about 14 miles long in a **N.** and **S.** direction, and contains several large and some small islands, between which are good channels with deep water. The dangers are comparatively few, and the most prominent are marked by buoys. There are numerous coves on both sides of the bay, and its head is divided into several large arms, the most important of which is **Union River Bay**, the approach to the city of Ellsworth and the town of Surry.

Blue Hill Bay is approached from the eastward across Bass Harbor Bar, from the southward between Black Island and Burnt Coat Island, and from the westward through Jericho Bay, which is entered through Merchant's Row, Deer Island Thoroughfare, or Eggemoggin Reach. These approaches are more or less obstructed by islands and ledges, but are sufficiently marked to be safely navigated in clear weather. Blue Hill Bay is the eastern approach to Casco Passage and York Narrows—see heading.

Bass Harbor, marked by a light-house, is at the southeastern point at the entrance to the bay (see page 66).

Mitchell's Cove, Duck Cove, Goose Cove, and Latty's Cove are small unimportant coves on the southwest side of Mt Desert Island, between Bass Harbor and Seal Cove; they are not sufficiently well sheltered to be used as anchorages.

Seal Cove, about 4 miles to the northward of Lopau's Point on the east shore of the bay, is a small but good anchorge much frequented by fishermen.

Herrick's Bay is a large, shallow and unimportant bight on the western side of Blue Hill Bay and northwest from Green Island, which is marked by Blue Hill Bay light-house (see table, page 16. The upper end of this bay is dry at low water.

Allen's Cove, rarely used as an anchorage, is just to the westward of Herriman's Point on the western shore of Blue Hill Bay and 4½ miles **N.** of Green Island.

Pretty Marsh Harbor makes into the eastern shore of the bay **NE.** from Hardwood Island.

Bartlett's Narrows lead between Mt. Desert Island and Bartlett's Island; the channel is narrow, but has a least depth of 9 fathoms. The eastern shore is bold-to.

WESTERN BAY

is to the northeastward from Bartlett's Island and is a part of the waters which separate Mt. Desert Island from the mainland. **Mt. Desert Narrows** (see page 58) are at the head of Western Bay. **Goose Cove** is a large shallow bight on the north side of the bay, at the head of which is the village of **West Trenton**. The deepest draught taken up to the village is 11 feet. Strangers should anchor between Alley's Island and Oak Point in 7 fathoms. If wishing to go farther up take a pilot.

BLUE HILL HARBOR,

is in the northwestern part of the bay, northwest from Long Island; it consists of a large bight, called the outer harbor, and a small arm extending to the northwestward to the village of **Blue Hill**, called the inner harbor. The latter has a narrow and crooked channel. Off the western shore of the outer harbor, and in the entrance to the inner harbor are several ledges which extend ½ mile from the shore in places; strangers should not attempt to enter the inner harbor without a pilot. Anchorage, sheltered from northerly and westerly winds, will be found in the outer harbor in 4 to 8½ fathoms of water. Vessels of 13 feet draught can enter the inner habor at low water although the entrance is quite narrow, but when inside there is good anchorage in 12 to 25 feet of water, sheltered from all winds. Vessels of 9 feet draught go to the village of Blue Hill at high water. The wharves are dry at low water. A steamer of the Rockland and Ellsworth line makes a landing at a wharf, near the entrance to the inner harbor. Strangers should take a pilot; if one has not been taken lower down the bay anchor ¼ mile south of the buoy (spar, black, No. 1), on eastern end of the middle ground, and wait for one. Ice closes the upper end of the harbor from December to April.

MORGAN'S BAY,

making in to the northward between Blue Hill Harbor and Newbury Neck, is about 3 miles long in a **N NE.** and **S SW** direction, but is little used. The entrance is obstructed by islands and ledges, leaving a very narrow channel with deep water close to the western shore. Good anchorage is found inside the islands in 6 fathoms, the water shoaling gradually toward the head of the bay.

UNION RIVER BAY

is a large bay extending about 5¼ miles in a **N.** by **E.** direction between Oak Point on the east and Newbury Neck on the west. It is free from dangers, except near its northern end. The head of the bay is separated into two arms; **Union River**, the eastern, leading to the city of Ellsworth, and **Patten's Bay**, the western, leading to the town of Surry.

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† Shown on Coast and Geoditic Survey charts: **307**, scale $\frac{1}{40,000}$, price $0.25; and **103**, scale $\frac{1}{80,000}$, price $0.50. The entrance is shown on chart **308**, scale $\frac{1}{40,000}$, price $0.25.

Patten's Bay is a long, narrow arm making to the northwestward from Union River Bay. The town of **Surry** is at its head. The deepest draught entering is 10 feet, but the depth in the channel up to the town is only 2 feet at low water, and the wharves run dry. Good anchorage will be found in the channel about ¾ to 1 mile below the town in 12 to 18 feet, soft bottom; deeper water, with good holding ground, will be found nearer the entrance. Ice closes the upper end of the bay during January, February, and March.

UNION RIVER,

emptying into the northeastern part of Union River Bay, is about ½ mile wide for 1 mile; then it becomes narrow and has a crooked channel up to the city of Ellsworth, about 4 miles above its mouth. There are several rocks and ledges off the entrance; the most prominent one is buoyed. The entrance above Weymouth Point is full of sawdust shoals, the depth over which is decreasing.

The city of **Ellsworth** is at the head of navigation. The deepest draught entering is 12 feet on very high tides; the usual draught is 10 feet The least water in the channel is 2 feet, and at the wharves 5 feet, at low water. Ellsworth is on the line of the Maine Central railroad and has steamboat communication with Rockland. Vessels bound to Ellsworth generally anchor off Weymouth Point and take a tow-boat or pilot; either will respond to signal.

Supplies.—Anthracite coal in limited quantity can be had alongside the wharf; provisions and ship chandler's stores can be obtained. Fresh water can be taken from the river at low water.

Repairs.—Light repairs to vessels and the machinery of steamers can be made; there are no marine railways or dry docks; for extensive repairs the nearest place is Bangor.

Marine Hospital.—Relief is furnished by an Acting Assistant Surgeon of the Marine Hospital Service. Patients requiring hospital treatment are sent to the Marine Hospital at Portland, Me.

Freshets occasionally occur in the spring.

Ice closes the river from December to April.

For tides and tidal data, see page 15.

SAILING DIRECTIONS, BLUE HILL BAY.

1. ***Approaching and Entering.—From the Eastward.***—Follow the directions for approaching Bass Harbor, page 66, and after crossing Bass Harbor Bar steer about **NW.** by **W.** ½ **W.**, until about 1½ miles to the westward of Lopau's Point, and the beacon on Ship and Barges Ledge bears **W.** ¾ **N.**, distant about 1¼ miles, then be guided by the directions in Sections 2 or 2 A, following.

Remarks.—**Lopau's Point**, also called **Bass Harbor Point**, is a partly wooded, rocky head at the western side of entrance to Bass Harbor.

1 A. ***Approaching and Entering.—From the Southward, passing East of Long Island.***—Bring Long Island Head to bear **W.**, distant ¾ mile, and steer **N.** ¾ **W.** for the westernmost of the Green Islands. When about ½ mile from it change course to **N NW.** ½ **W.**, leaving it ¼ mile on the starboard hand, and passing about 400 yards **W.** of Placentia Island. When the western end of Placentia Island bears **N.**, distant 400 yards, steer **N.**, passing about 1½ miles to the westward of Lopau's Point. When the beacon on Ship and Barges Ledge bears **W.** ¾ **N.**, distant about 1¼ miles, follow the directions in Sections 2 or 2 A.

Remarks.—The **Green Islands** are two small rocky islets lying about ¾ mile **S.** of Black Island and 1¾ miles **NE.** by **N.**, from Northeast Point of Long Island.

On the **N NW.** ½ **W.** course Black Island will be left a little over ½ mile on the starboard hand. The western shore of Placentia Island is bold-to, and can be approached as close as 100 yards. On the **N.** course Bass Harbor will be open broad off the starboard bow, and the eastern entrance to Casco Passage and York Narrows will be seen to the westward. The beacon on Ship and Barges Ledge will show prominently off the port bow.

Dangers.—**The Drums** is a dangerous ledge, which shows bare at low water; it lies 2¼ miles **NE.** ½ **N.** from Long Island Head, and is marked off its southeastern end by a buoy (spar, black, No. 1). This ledge is avoided by keeping the western end of Placentia Island showing in range or to the westward of the westernmost of the Green Islands.

Northeast Ledge is a small spot, with 16 feet over it, lying ½ mile **E NE.** from the northeast point of Long Island.

Beaumond Ledge, with 9 feet over it, and **Otter Island Ledge**, showing bare at low water, are two small ledges lying about 1 mile **SW.** by **W.** ½ **W.** from the westernmost of the Green Islands They are left well on the port hand.

Staples Ledge is a small ledge, dry at low water, lying nearly 1 mile **W NW.** from the western end of Placentia Island; it is marked by a buoy (spar, red and black horizontal stripes) placed off its eastern side.

1 B. ***Approaching and Entering.— From the Southward, passing West of Long Island.***—Follow the directions for approaching Bass Harbor from the southward, page —; continue the **N.** course past Placentia Island, and pass about 1½ miles to the westward of Lopau's Point; then be guided by the directions in Sections 2 or 2 A, following.

1 C. ***Approaching and Entering.—From the Westward, having come through Casco Passage.***—Having followed directions in Section 1 A, "Sailing Directions across Blue Hill Bay through Casco Passage and across Jericho Bay," when on the **E.** ⅛ **N.** course and the tripod on Orono Point is ½ mile distant on the starboard quarter, steer **NE.** ¼ **E.**, passing about ⅜ mile **S.** of the beacon on Ship and Barges and heading for the end of Nutter's Point. When Ship and Barges beacon bears **W.**, distant about ⅜ mile, steer **N.** about 2 miles, then steer **N NW.** and follow the directions in Sections 2 or 2 A, according to destination.

From the Westward, having come through Eggemoggin Reach.—Bring Devil's Head to bear **N.**, distant about 500 yards, and steer **E.** ¾ **S.**, heading so as to pass midway between Smutty Nose and Mahoney's islands. Pass about 100 yards **S.** of red spar-buoy No. 4, and leave the red and black horizontal-striped spar-buoy on Hay Island Ledge about 200 yards on the starboard hand. When the southeastern end of Smutty Nose Island bears **N.**, distant 50 yards, steer **E NE.** ¼ **E.**; black can-buoy No. 1 should be made on the starboard bow, and be left about 250 yards on the starboard hand. When Blue Hill bay light bears **NW.**, steer **N NE.** ¾ **E.** for the southern end of Tinkers Island, and when the light bears **W.** ½ **N.**, steer **N NW.** ½ **W.** until the northern end of Tinkers Island bears **E.**; then—

If bound to Ellsworth, Surry, or Western Bay, steer **NE.** ¼ **E.**, heading for the southeastern end of Long Island, and leaving red spar-buoys Nos. 2 and 4 about 350 yards on the starboard hand. Give the southern and southeastern shores of Long Island a berth of about ⅜ mile. Round the southeastern point of Long Island at a distance of ⅜ mile, steer **N NE.** for High Head, and follow the directions in Section 2.

If bound to Blue Hill Harbor, steer **N.** ¾ **E.** about 2 miles, until Herman's Point bears **W SW.**; then steer **NW.** ¼ **N.**, and follow the directions in Section 2 A.

Remarks.—*Having come through Casco Passage.*—When on the **NE.** ¼ **E.** course there are no dangers except the Ship and Barges. **Nutter's Point** is the northern point at entrance to Goose Cove; it is about 90 feet high and thickly wooded. On the **N.** course the middle and highest part of Hardwood Island should be ahead. When the course is changed to **N NW.**, the hill (about 40 feet high) on the southern end of Bar Island will bear **W.**, distant nearly 1 mile.

Having come through Eggemoggin Reach.—On the **E.** ¾ **S.** course **Mahoney's Island**, grassy top, with a few straggling trees, will be on the starboard bow. The small, bare island **NW.** from Mahoney's Island is **Smutty Nose Island.** On the **E NE.** ¼ **E** course, Blue Hill Bay light will be broad off the port bow, and the entrance to Herrick's Bay will be opened to the westward of it. The sailing line passes about midway between **Lamp Island**, a bare islet north of Pond Island and joined to the latter at low water by a bare ledge, and **Channel Rock**, a small, dark, bare rock ½ mile **SE.** from Blue Hill Bay light. When this rock is in range with the light the course should be changed to **N NE.** ¾ **E.**, care being taken to give the rock a berth of over ¼ mile while to the eastward of it. The **N NW.** ½ **W.** course does not approach the western shore of Tinkers Island closer than ¼ mile. On the **NE.** ¼ **E.** course, the northern end of Tinkers Island should be given a berth of at least ½ mile and the southern shore of Long Island a berth of at least ¼ mile. A shoal with a depth of 10 feet near its end extends nearly ¼ mile to the eastward from the southeastern point of Long Island.

For the principal dangers passed while following these directions, see "Sailing Directions, Blue Hill Bay to Jericho Bay and Eggemoggin Reach by the passage north of Pond Island," pages 72–73.

2. ***From abreast Lopau's Point to Ellsworth or Surry.***—With the beacon on Ship and Barges bearing **W.** ¾ **N.**, distant about 1¼ miles, steer **N NW.** for 5 miles. The passage to the eastward of Long Island will then be well opened, and the southern end of Hardwood Island will bear **E.**; then change the course to **N NE.**, with High Head directly ahead. As this point is approached, haul to the eastward so as to pass midway between it and the northern point of Bartlett's Island. When the latter point bears **E.** by **S.**, steer **N.** by **E.** ¾ **E.**, directly up Union River Bay. Tupper's Ledge buoy (spar, black, No. 3) will be made directly ahead; then—

If bound to Ellsworth leave this buoy 100 yards on the port hand; anchor just to the southward of Weymouth Point (the western point at entrance to Union River) in 3¼ to 4 fathoms, and get a pilot.

If bound to Surry leave Tupper's Ledge buoy ¼ to ½ mile on the Starboard hand; steer about **N NW.** ½ **W.**, and when Patten's Bay is entered keep about midway between the shores. The channel narrows rapidly and strangers should anchor near the entrance.

If bound into Western Bay follow the preceding directions until the northern point of Bartlett's Island bears **E.** by **S.**, distant 1 mile, and then steer **E NE.** Anchor in 7 fathoms of water between the south end of Alley's Island and Oak Point.

Remarks.—On the **N NW.** course Ship and Barges ledge, marked near its northern end by a black iron spindle, and at its southern end by a beacon, East Barge, Ship Island, Trumpet Island, Bar Island, and Tinkers Island will be left on the port hand in the order named. These islands are connected by shoals and should not in general be approached closer than ⅜ mile. Moose Island and Hardwood Island will be seen on the starboard bow, and Long Island, the large island lying in the northern central part of the bay, will be ahead.

On the **N NE.** course the southeastern point of Long Island should be given a berth of nearly ½ mile, and High Head, the southeastern point of Newbury Neck will be ahead. The western shore of Bartlett's Island will be given a berth of ½ mile.

On the **N.** by **E.** ¾ **E.** course Weymouth Point, the western point at entrance to Union River, will be directly ahead

Dangers.—**Ship and Barges Ledge**, lying ½ mile in a southeasterly direction from Ship Island, is about 400 yards in extent and partly bare at low water; it is marked at its northern end by a black iron spindle, and at its southern end by a black tripod beacon.

A shoal makes out about ⅜ mile in a southwesterly direction from the southwest point of Hardwood Island. The shores above this and up to Tupper's Ledge are quite bold-to, and all danger may be avoided by giving them a berth of ¼ mile.

Tupper's Ledge, a rocky shoal lying about ⅜ mile **S SW.** from Weymouth Point, has a spot bare at low water, and is marked by a buoy (spar, black, No. 3) off its southern end.

Lord's Rock, a small, rocky shoal with 9 feet of water on it, lies ⅜ mile **E SE.** ½ **E.** from Tupper's Ledge buoy.

2 A. ***From Lopau's Point to Blue Hill.***—From a position about 1¼ miles **E.** ¾ **S.** from Ship and Barges beacon steer **N NW.** about 5 miles; the southern end of Hardwood Island will then bear **E.**, distant 1 mile. Then steer **NW.** ¼ **N.** about 3½ miles. The passage to the westward of Long Island will then be well opened and the course for 3¾ miles is **N NE.** When the northern end of Long Island bears **E.** by **S.**, distant about 1 mile, steer **N NW.** ½ **W.** Eastern Point Middle Ground buoy (spar, black, No. 1) will be made on the starboard bow. Anchor about ¼ mile to the southward of the buoy in 7 fathoms of water, and if bound farther up take a pilot.

Vessels bound to Blue Hill may also pass to the eastward and northward of Long Island, giving its shores a berth of ¼ mile.

Remarks.—On the **N NW.** course, see remarks under Section 2. On the **NW.** ¼ **N.** course, as Tinkers Island is passed, **Herriman's Point**, low, fringed with trees, will be seen on the port bow and the southwestern part of Long Island will be on the starboard bow, close on to **Blue Hill Neck**, the mainland to the westward, so that the passage to the westward of Long Island will not be opened until well to the northward of Herriman's Point.

SAILING DIRECTIONS.—BLUE HILL BAY TO JERICHO BAY AND EGGEMOGGIN REACH BY THE PASSAGE NORTH OF POND ISLAND.

Vessels bound through Casco Passage and headed off by the wind, and those of over 12 feet draught usually use this passage, which has a depth of 27 feet, with the exception of a 12-foot rock lying in the middle of the channel north of Pond Island.

1. ***From Bass Harbor Bar bound West.***—From Bass Harbor Bar steer **W NW.** ½ **W.** and pass about ¼ mile south of Ship and Barges Ledge beacon. When the beacon bears **N NE.** steer about **NW.** ¼ **N.** for Blue Hill Bay light; leave West Barge about 300 yards on the starboard hand and Pond Island Point buoy about 250 yards on the port hand; round the buoy at this distance and steer **W.** until the northern end of Mahoney's Island bears **SW.** by **W.** ½ **W.**, when it should be steered for; then—

I. *If bound to Eggemoggin Reach*, when about 1 mile distant from Mahoney's Island, steer **W SW.** ½ **W.**; pass about 350 yards north of that island and 250 yards south of Smutty Nose Island, and when the eastern end of the latter bears **N.** steer about **W.** ¾ **N.** and pass about 100 yards south of Devil's Head Ledge buoy, leaving Hay Island Ledge buoy on the port hand. When 500 yards to the westward of these buoys, follow the directions in Section 1, "Sailing Directions, Eggemoggin Reach."

II. *If bound to Deer Island Thoroughfare*, when about 1 mile distant from Mahoney's Island, steer **SW.** ¾ **S.** and leave Mahoney's Island at least ¼ mile on the starboard hand. When Egg Rock beacon bears **E.**, steer **W.** until up to Long Ledge buoy (spar, red, No. 2), when the directions in Section 1, "Sailing Directions, Deer Island Thoroughfare," should be followed.

Remarks.—Standing across Blue Hill Bay on the **W NW.** ½ **W.** course, the southern end of Pond Island will be ahead. **Ship Island**, a small, grassy island with abrupt slope on south side, will be on the starboard bow. **East Barge** is a small rocky islet just south of Ship Island, with shoal water between. **West Barge** is a small rocky islet, a little over ¼ mile to the westward of Ship Island; it is bold-to on its western side.

On the **NW.** ¼ **N.** course for Blue Hill light, **Channel Rock**, a small, bare rock, will be a little on the starboard bow; **Lamp Island**, a small, bare islet, is near the northern end of the bare ledge making off north from Pond Island. In rounding black can-buoy No. 1, care should be taken not to be set on the 12-foot spot which lies 700 yards **S.** by **E.** ½ **E.** from Channel Rock, on a line between it and Lamp Island. On the **SW.** by **W.** ½ **W.** course, Mahoney's Island, having a few scattered trees, will be ahead, and Smutty Nose Island, small rocky island **NW.** from Mahoney's Island, will be on the starboard bow. Passing between Mahoney's and Smutty Nose islands, Mahoney's Island Ledge buoy should be made on the port bow and left on the port hand; Hay Island Ledge buoy can be left on either hand; the sailing line passes to the northward of it and south of Devil's Head Ledge buoy.

Dangers.—**Ship and Barges Ledge** is about 350 yards long in a **NW.** and **SE.** direction, and is bare at half tide; it lies nearly ⅝ mile **S SE.** from Ship Island and 2⅞ miles **W NW.** ¾ **W.** from Lopau's Point. The northern end of the ledge is marked by a spindle (iron, 30 feet high) and its southern end by a tripod beacon (wood, black).

Pond Island Point makes off shoal ½ mile to the northward from the island, and for over half this distance shows bare at half tide. Lamp Island is about ¼ mile **N.** of Pond Island. Off the northern end of the shoal is a buoy (can, black, No. 1).

Channel Rock is a small, bare rock ½ mile **SE.** from Blue Hill Bay light-house. Shoals with a least depth of 3 feet over them extend nearly ⅝ mile **E SE.** ½ **E.** from this rock and about 250 yards to the southwestward from it.

A 12-foot spot lies about 700 yards **S.** by **E.** ½ **E.** from Channel Rock. This spot is unmarked and can be left on either hand as there is a depth of 24 feet around it. The sailing line passes to the southward, between it and the buoy marking the shoals making off from Pond Island.

Flye Island Ledge consists of a number of spots, with from 7 to 18 feet over them, that lie to the southward of Blue Hill Bay light; these can be avoided, when coming from the eastward, by keeping to the eastward of a line drawn from Channel Rock to the highest point of Mahoney's Island until Lamp Island is in range with East Barge.

Mahoney's Island has shoals and ledges making out about 250 yards to the northward and southward from it.

Shoals make out 125 yards to the southeastward and nearly 200 yards to the northwestward from Smutty Nose Island.

Mahoney's Island Ledge shows bare in some places at low water and lies **W.** by **S.** from Mahoney's Island; it is marked off its northwestern end by a buoy (spar, red, No. 2).

Hay Island Ledge, about 1 mile **W.** ½ **N.** from the northern end of Mahoney's Island, is described under heading "Eggemoggin Reach."

EGGEMOGGIN REACH.†

This passage between the Deer Isles and the mainland is about 11 miles long in a **NW.** and **SE.** direction, and has a least width at Byard's Point of ⅝ mile. Its depth is sufficient for the heaviest draught vessels, and as the principal dangers are indicated by buoys, they can easily be avoided. The eastern entrance is well marked by **Devil's Head**, a very prominent, high, rocky bluff on the southern end of Hog Island, and the western entrance by **Pumpkin Island light** (see table of lights, page 16) and Cape Rosier.

Greenlaw's Cove, on the western side of the eastern entrance to Eggemoggin Reach, is long and narrow, and only navigable for small vessels.

Centre Harbor, a small cove on the eastern side of the reach to the eastward of Torry's Islands, has several wharves on its northern shore. The town of **Brooklin** is at the head of the harbor.

Benjamin River, the approach to the town of Sedgwick, makes into the eastern shore about 2 miles to the northward of Centre Harbor. The channel at the entrance, to the northward of Cape Carter, has a least depth of 19 feet, but is much obstructed by ledges on both sides, leaving a passage only 100 yards wide at its narrowest part. The town of **Sedgwick**, at the head of navigation, can only be reached at high water, as the river runs dry some distance below. Steamers passing through the reach in summer make landings at the steamboat wharf, about 1 mile below the town.

North Deer Isle is a village on the northern end of Deer Isle; it has a steamboat landing at which steamers of several lines touch on their way through the reach.

Billings' Cove, on the northern shore of the reach, lies east of Byard's Point. It affords good anchorage in 20 feet of water just inside of the point off the steamboat wharf, and is frequently used by vessels anchoring for the night. **Sargentville**, a village on the northern shore of the cove, is one of the landings for steamers passing

† Shown on Coast and Geodetic Survey charts: **309**, scale $\frac{1}{40,000}$, price $0.25; and **104**, scale $\frac{1}{80,000}$; price $0.40.

through the reach in summer. A ferry from North Deer Isle lands here. Fresh water can be obtained alongside the steamboat wharf.

Buck's Harbor is a small harbor on the north side of the reach, lying **N NE.** from Pumpkin Island light-house; it affords excellent anchorage and is often used by small vessels. **Harbor Island**, lying in the middle of the harbor, has a good channel around it, which forms the anchorage. The village of **South Brooksville** is at the head of the harbor.

Orcutt's Harbor lies just to the westward of Buck's Harbor; its entrance is **N.** by **W.** from Pumpkin Island light-house. It is about 1¼ miles long in a **N NE.** direction, and ¼ mile wide. It has good anchorage in 3½ to 8½ fathoms of water just inside the entrance.

Horseshoe Cove is a long, narrow cove, the entrance to which lies **NW.** by **N.** from Pumpkin Island light-house; it is not navigable for any but the smallest class of vessels.

Anchorages.—Vessels can anchor anywhere in the reach where the water is not too deep and where the bottom is soft, making a lee of either shore, according to the direction of the wind.

Tides.—The mean rise and fall of tides is about 10 feet (see table of tides, page 15).

SAILING DIRECTIONS, EGGEMOGGIN REACH.

1. *Entering from the Eastward.*—Having followed the directions for Casco Passage, Section 1, page 76, or from Blue Hill Bay, Section 1, page 72, when Channel Rock buoy, (spar, black, No. 1), lying nearly ½ mile **S.** by **W.** ¾ **W.** from Devil's Head, is on the port beam, distant about 350 yards, steer **NW.** by **N.** for Torry's Castle beacon; leave Devil's Head about 300 yards on the starboard hand and Conary's Island about 500 yards on the port hand. When Conary's Ledge buoy (spar, black, No. 3) is on the port beam, distant about 250 yards, steer **NW.** until Torry's Castle beacon is distant about 600 yards and in range with the northern end of Torry's Islands; then change course to **N NW.** ¼ **W.** When Stump Cove Ledge buoy (spar, red, No. 8) bears **E.**, distant about ¼ mile, steer **NW.** ½ **W.**, and when Byard's Point buoy (spar, red, No. 10) bears **E.**, distant about 500 yards, steer **NW.** ¾ **N.** and proceed as directed in Section 2, following.

Remarks.—On the **NW.** by **N.** course Torry's Castle beacon will appear very prominently ahead. Devil's Head should be left about 350 yards distant on the starboard hand when abeam. Red spar-buoy No. 4½, lying ⅜ mile **N.** ¾ **E.** from Torry's Castle, and red spar-buoy No. 6, lying ⅞ mile **N.** by **W.** ¼ **W.** from Torry's Castle, will be left about ½ mile on the starboard hand on the **N NW.** ¼ **W.** course.

The **NW** ½ **W.** course leads fair between Byard's Point and Little Deer Isle, leaving Little Sally about 250 yards on the port hand.

Dangers.—**Hay Island Ledge**, a small detached rocky shoal with 7 feet of water on it, on the eastern side of the entrance to the reach, about ½ mile **SE.** by **S.** from Devil's Head, is marked by a buoy (spar, red and black horizontal stripes).

Devil's Head Ledge, with spots bare at low water, makes out ¼ mile to the southeastward from Devil's Head, and is marked on its end by a buoy (spar, red, No. 4).

Channel Rock, with 2 feet of water on it, is marked on its northeastern side by black spar-buoy No. 1; the rock lies about ½ mile **S.** by **W.** ¾ **W.** from Devil's Head, on the western side of the entrance to the reach.

The Boulders, bare at low water, lie about ¼ mile **NW.** by **W.** ¼ **W.** from Channel Rock.

Conary's Ledge, a rocky shoal with 4 feet of water on it, lies a little over ⅝ mile **N.** by **W.** ¼ **W.** from the northern and highest point of Conary's Island; it is marked by black spar-buoy No. 3, placed **NE.** from it.

Torry's Ledge is the northernmost of the rocky shoals making out to the northward from Torry's Island, and lies ⅝ mile **N.** by **E.** ½ **E.** from Torry's Castle beacon; it has 2 feet of water on it and is marked by red spar-buoy No. 4½.

A rocky shoal, lying ⅞ mile **N.** by **W.** ¼ **W.** from Torry's Castle beacon, has 15 feet of water on it and is marked by red spar-buoy No. 6.

An unmarked 11-foot rocky shoal lies nearly ½ mile **SW.** by **W.** ½ **W.** from **Bridge's Point**, the point about 1⅝ miles northwest from the entrance to Centre Harbor; it is left about ⅝ mile on the starboard hand when standing up the reach.

Stump Cove Ledge, with 3 feet of water on it, makes out ⅝ mile to the westward from the northern side of the entrance to Benjamin River. It is marked on its southwestern end by a buoy (spar, red, No. 8).

Closson's Ledges and **Tinker Ledges** make off nearly ⅜ mile from the shore of Deer Isle west from the entrance to Benjamin River. They have several spots showing bare at half tide, and are marked off their northeastern end by Tinker Ledges buoy (spar, black, No. 5). A rocky spot with 16 feet over it lies about 400 yards **E NE.** from this buoy.

A red and black horizontal striped spar-buoy marks a rock off the eastern shore below the steamboat wharf in the entrance to Billing's Cove. There is no channel inshore of this buoy.

A shoal makes off from the southern end of Byard's Point for a distance of 200 yards, and is marked at its end by a buoy (spar, red, No. 10).

Little Sally is a bare rock, surrounded on all sides by sunken ledges which make off 300 yards from the shore of Deer Isle, opposite Byard's Point. The rock should be given a berth of at least 125 yards, passing to the eastward of it.

2. *From Byard's Point to East Penobscot Bay.*—With Byard's Point buoy (spar, red, No. 10) bearing **E.**, distant about 500 yards, steer **NW.** ¾ **N.** until Pumpkin Island light bears **SW.** ½ **W.**; then steer **W.**, and when Pumpkin Island light bears **SE.** by **S.**, steer **SW.** by **W.** ¼ **W.** so as to pass midway between Spectacle Island Ledge buoy (spar, red, No. 12) and Two Bush Ledge buoy (spar, red and black horizontal stripes).

When Spectacle Ledge buoy bears **N.**, distant 500 yards, steer **W.** by **N.**, and when the western end of Cape Rosier bears **NE.**, steer **N.** by **E.** ½ **E.** and follow the directions in Section 3, "Sailing Directions, East Penobscot Bay."

If bound across Penobscot Bay or to Rockland, when abreast Spectacle Ledge buoy, follow the directions in Section 3.

Remarks.—On the **NW.** ¾ **N.** course Howard Ledges buoy (spar, black, No. 7) will be left 350 yards on the port hand.

On the **W.** course The Triangle Ledges buoys (spar, black, Nos. 9 and 11) will be left about 400 yards, and Pumpkin Island light about ⅝ of mile on the port hand.

The **SW.** by **W.** ¼ **W.** course leads about 300 yards from Pumpkin Island Ledge buoy (spar, black, No. 13), and 500 yards from Merriman's Ledge buoy (spar, black, No. 15), both on the port hand, and about 500 yards from Thrumbcap Ledge (a portion of which is bare) and Spectacle Island Ledge buoy (spar, red, No. 12), on the starboard hand Two Bush Ledge buoy will be left on the port hand.

On the **W.** by **N.** course **Spectacle Island** should be left 400 yards on the starboard hand; **Blake's Point**, the southern end of Cape Rosier, will be left about ⅜ mile on the starboard hand.

Dangers.—**Howard Ledges** is a rocky shoal ⅝ mile long in a **N NW.** and **S SE.** direction, lying off the shore of Little Deer Isle about 1¼ miles above Byard's Point; it has from 1 to 9 feet of water on it and is marked on its northern end by black spar-buoy No. 7.

The Triangles are three ledges forming a triangle off the northern end of Little Deer Isle, with from 2 to 9 feet of water on them. They are marked by two buoys (spar, black, Nos. 9 and 11) lying about **NE.** by **E.**, distant respectively 900 and 600 yards from Pumpkin Island light-house.

Pumpkin Island Ledge, a small detached rock with 10 feet of water on it, lies ⅝ mile **NW.** ½ **W.** from Pumpkin Island light-house, and is marked by black spar-buoy No. 13.

Thrumbcap Ledge is an unmarked rocky shoal, with a few heads bare at high water, lying ¾ mile **NW.** from Pumpkin Island light-house.

Merriman's Ledge, a bare rock showing at all stages of the tide, lying **W.** ¾ **N.**, distant ⅝ mile from Pumpkin Island light-house, is marked on its northern end by a buoy (spar, black, No. 15). It should be left ¼ mile on the port hand on the **SW.** by **W.** ¼ **W.** course.

Spectacle Island Ledge is a small shoal with 6½ feet of water on it, lying 1⅛ miles **W.** by **N.** from Pumpkin Island light-house; it is marked on its eastern end by red spar-buoy No. 12.

Two Bush Ledge, with 4½ feet of water on it, lies nearly 1 mile **W SW.** ¾ **W.** from Pumpkin Island light-house; it is marked on its western side by a red and black horizontal striped spar-buoy.

Shoals surround Spectacle Island—the island lying 1⅝ miles **W.** by **N.** from Pumpkin Island light-house—and the small island just to the westward of it; they are avoided by giving the southern side of the islands a berth of at least 250 yards.

3. *From Eggemoggin Reach to Rockland, crossing Penobscot Bay.*—When Spectacle Ledge buoy bears **N.**, distant 500 yards, steer **SW.** ½ **S.**, and when the western edge of Hog Island is in range with the western edge of Western Island bearing **NW.** ¼ **W.**, change the course to **SW.** by **W.** When midway between Great Spruce Head Island and Beach Island steer **W.**, passing midway between Horse Head and Little Spruce Head islands. When Little Spruce Head Island bears **S.**, steer **SW.** ¾ **W.**, and when McIntosh Ledge buoy (nun, red and black horizontal stripes) bears abeam, in range with Mark Island red bell-buoy, steer **W.** by **S.** if bound to Rockland, or **SW.** by **W.** ½ **W.** if bound through Muscle Ridge Channel, and follow the directions given under headings "Rockland Harbor" or "Muscle Ridge Channel," according to destination.

Remarks.—The **SW.** ½ **S.** course leads a little over ¼ mile to the eastward of Fiddle Head and Hog Island. **Western Island** is the second large island to the northwestward of Hog Island; **Green Ledge**, a small grassy island, will be first opened to the westward of Hog Island, and Western Island will be opened soon afterwards on the **SW.** ½ **S.** course.

On the **SW.** by **W.** course the western end of **Great Spruce Head Island**, high, bare, white, and rocky, will be ahead. **Beach Island**, grassy, high at both ends and low in the middle, with its northern end wooded, will be left ¼ to ⅜ mile on the starboard hand.

On the **W.** course **Little Spruce Head Island**, the northern end high and covered with a scrubby growth of trees, will be left about ¼ mile on the port hand.

On the **SW.** ¾ **W.** course, **Compass Island**, a small rocky isle about 40 feet high, and **Egg Rock**, a small bare rock, will be left about ¾ mile on the port hand. When McIntosh Ledge buoy is in range with Mark Island bell-buoy,

Mark Island Point red spindle will appear a little to the northward of the bell-buoy. **Robinson's Rock**, a small rocky isle, will show a little to the left and about half way between McIntosh Ledge buoy and Mark Island bell-buoy.

Dangers.—**Fiddle Head** is a bare rocky isle with steep faces, lying to the northeastward of Hog Island and joined to it by shoals bare at low water. Shoals make out 200 yards to the southward of it, and should be left about ¼ mile on the starboard hand on the **SW. ½ S.** course.

Beach Island has shoals making out about 250 yards from its eastern end; it should be left about ⅜ mile on the starboard hand on the **SW.** by **W.** course.

An unmarked 11-foot shoal spot lies 400 yards **NE.** from the northeastern end of Great Spruce Head Island.

Egg Rock is a small bare rock, about 15 feet out of water, and surrounded by deep water; it lies nearly 1¾ miles **SW. ¼ W.** from Compass Island.

Egg Rock Ledge is small, has 5 feet over it, and lies ⅜ mile **S SW. ¾ W.** from Egg Rock. It is marked by a buoy (spar, red and black horizontal stripes).

McIntosh Ledge is a small rock with 2 feet over it, lying nearly ¾ miles **SE.** by **E.** from Robinson's Rock—the southernmost of the bare islands and rocks making to the southwestward from South Islesboro—and 5¼ miles **NE.** by **E. ⅛ E.** from Owl's Head light-house. The ledge is marked by a buoy (nun, red and black horizontal stripes) placed off its southwestern side.

CASCO PASSAGE, YORK NARROWS, AND JERICHO BAY.†

To the northward of Burnt Coat (Swan's) Island, between it and John's, Calf, and Black islands, there is a narrow passage which separates into two branches in its western part. The eastern end and northern branch is known as **Casco Passage,** the southern branch as **York Narrows.** North of Pond Island there is a much deeper and wider passage—see Sailing Directions, pp. 72–73—connecting Blue Hill and Jericho bays. They all form a part of the inland passage from Mt. Desert to Whitehead. Casco Passage and York Narrows are well marked by buoys, and at the eastern entrance, on the northern part of Orono Island, there is a large black tripod. Casco Passage is the straighter and has the better water.

Vessels of 16 feet draught have been taken through, but the usual draught is 10 to 12 feet; strangers of over 10 feet draught are advised to take a pilot, stopping for one at Southwest Harbor or Bass Harbor. Sailing directions are given for Casco Passage. Vessels using York Narrows should be guided by the buoys; there are two rocks with 6 and 10 feet of water over them, respectively, which make its navigation dangerous.

On the eastern shore of the broad bight in the north side of Burnt Coat (Swan's) Island is the village and post office of **Atlantic.** The bight is sometimes used by fishermen for an anchorage, but it contains many ledges.

Jericho Bay is the body of water to the westward of Marshall's and Burnt Coat islands and is the approach from the eastward to Eggemoggin Reach, Deer Island Thoroughfare, and Merchant's Row. It has deep water, but there are many ledges, rocks, and small islands which make its navigation hazardous to a stranger. The dangers can be avoided by studying U. S. Coast and Geodetic Survey charts 308 and 309; a detailed description of them would be confusing on account of their number. Approaching Jericho Bay from the southward it is advisable to pass between Marshall's and Burnt Coat islands where the dangers are well marked. The western passage between Marshall's Island and Isle au Haut is obstructed by a number of unmarked sunken ledges, and should not be attempted without a pilot.

Tidal Currents.—The flood sets to the eastward and the ebb to the westward through Casco Passage. The velocity of the currents is influenced greatly by strong winds.

SAILING DIRECTIONS ACROSS BLUE HILL BAY, THROUGH CASCO PASSAGE AND ACROSS JERICHO BAY.

These directions are good for vessels of 12 feet draught in the daytime with clear weather when the buoys can be seen. Vessels of greater draught should take a pilot. The directions from the westward are given only from Merchant's Row and Deer Island Thoroughfare, they being the ones generally used and most difficult to reverse.

1. ***Entering from the Eastward.***—Having crossed Bass Harbor Bar, as directed in the Sailing Directions for Bass Harbor, page 66, bring Bass Harbor light to bear **E. ⅛ N.** and steer **W. ⅛ S.**; pass about 350 yards south of Black Island, and when the tripod on Orono Point bears **S SW.**, distant about 400 yards, steer about **NW.** by **W. ¾ W.** for red spar-buoy No. 2, leaving black spar-buoy No. 3 on the port hand. Leave red buoy No. 2 on the starboard hand and steer **W NW. ½ W.**; pass just to the northward of black spar-buoy No. 5, and then steer a little more to the westward, leaving black spar-buoy No. 7 about 50 yards on the port hand; when this buoy is abeam steer **W. ½ S.**, passing about 200 yards south of red spar-buoy No. 4. When red buoy No. 4 bears **NE.** by **N.**, distant about 300 yards—

†Shown on Coast and Geodetic Survey charts: **307, 308,** scale of each $\frac{1}{40,000}$, price of each $0.25; and **103,** scale $\frac{1}{80,000}$, price $0.50.

If bound through Deer Island Thoroughfare, continue the **W.** ½ **S.** course; pass at least 250 yards to the northward of Egg Rock beacon, and when past this beacon steer **W.** ½ **S.** for Long Ledge buoy (spar, red, No. 2), which is left close-to on the starboard hand; then follow the directions in Section 1, under heading "Deer Island Thoroughfare," page 79.

If bound through Merchant's Row, steer **SW.** about 1 mile; Swan Island Head will then be on the port beam and Sunken Egg Rock buoy (spar, red and black horizontal stripes) about 600 yards on the starboard beam. From this position steer **SW.** by **W.** ½ **W.**; leave The Woodbury buoy (spar, red and black horizontal stripes) about 500 yards on the port hand and Whaleback Ledge buoy (spar, red, No. 2) about ½ mile on the starboard hand; the course leads about midway between Southern Mark Island and *Southern Mark Island Ledge,* a small bare rock, surrounded by ledges, about ¾ mile to the northward of the island. When the spindle on Colby's Ledge bears on the starboard beam, distant about 500 yards, follow the directions in Section 1, under heading "Merchant's Row," page 81.

If bound through Eggemoggin Reach, steer **NW.** ¼ **N.**; leave Hay Island Ledge buoy and Devil's Head Ledge buoy on the starboard hand and Channel Rock buoy (spar, black, No. 1) on the port hand and follow the directions in Section 1 under heading "Eggemoggin Reach," page 74.

Remarks.—Standing across Blue Hill Bay from Bass Harbor Bar, on the **W.** ⅛ **S.** course, **Black Island**, dark and wooded, will be a little on the starboard bow and the entrance to Casco Passage will be ahead. Orono Point tripod, black, will be made on the port bow and the buoy to the northward (spar, black, No. 1) will be made and should be left on the port hand. The buoys marking the channel through York Narrows will be seen to the southwestward. At low water several ledges will be seen between the Casco Passage and York Narrows. On the **NW.** by **W.** ¾ **W.** course red spar-buoy No. 2 should be a little on the starboard bow, and two black spar-buoys will be seen on the port bow farther to the westward; these buoys must be passed close-to, as the channel is narrow to the eastward of black spar-buoy No. 7.

On the **W.** ½ **S.** course for the entrance to Deer Island Thoroughfare, **Eastern Mark Island**, rocky and about 300 yards in diameter, will be ahead. **Shabby Island**, a small rocky island with a remarkable scraggy tree, lying ⅞ mile **E SE.** from Eastern Mark Island, will be on the port bow. The beacon on Egg Rock will be on the port bow; when past this beacon Long Ledge will be seen at half tide to the northward of the course, and the buoy (spar, red, No. 2) on the southern end of the ledge will be ahead.

Standing across Jericho Bay for the entrance to Merchant's Row, on the **SW.** course, the beacon on Egg Rock and the buoy on Sunken Egg Rock will be broad off the starboard bow. On the **SW.** by **W.** ½ **W.** course, **Southern Mark Island**, small, with smooth rocky faces, will be on the port bow; the sailing line leads about ⅝ mile to the northward of the island. Vessels entering Merchant's Row from the southward, without a pilot, should enter Jericho Bay between Marshall's and Burnt Coat islands (see Section 1, page 78).

Dangers.—Standing across Blue Hill Bay no dangers will be encountered until the entrance of Casco Passage and York Narrows is approached; here the buoys should be closely followed, as shoals and ledges, a description of which would be useless, lie on both sides of the channel.

Casco Passage Ledge is about 200 yards in diameter, has a least depth of 10 feet over it, and lies at the western entrance to Casco Passage, about ⅝ mile **SW.** by **S.** from the southwestern point of John's Island. The channel leads south of the ledge, which is marked off its southern end by a buoy (spar, red, No. 4).

Egg Rock, marked by a beacon (wooden tripod, red) is a small bare rock surrounded by ledges; it lies 1⅛ miles **SW.** by **S.** from the southwestern point of John's Island and can be avoided by giving the beacon a berth of 300 yards.

Sunken Egg Rock is a small cluster of rocks, with 8 to 18 feet of water over them, lying ⅜ mile **SW.** by **S.** from Egg Rock beacon. The ledge is marked by a buoy (spar, red and black horizontal stripes) and can be avoided by giving the buoy a berth of 250 yards. There is good water between this danger and Egg Rock.

A Shoal, with a least depth of 11 feet and about 250 yards long in a **N.** and **S.** direction, lies to the northward of the sailing line approaching the entrance to Deer Island Thoroughfare; it lies 1⅛ miles **W.** ¾ **N.** from Egg Rock beacon.

A small spot with 18 feet of water over it lies 1½ miles **W SW.** from Egg Rock beacon.

The Woodbury is a small 10-foot spot lying 1¾ miles **SW.** ½ **S.** from Egg Rock beacon and nearly 1 mile off the western shore of Burnt Coat Island; it is marked by a buoy (spar, red and black horizontal stripes) which is left on the port hand standing for the entrance to Merchant's Row.

Hanus Ledge is a small 11-foot spot, unmarked, lying nearly ½ mile off the western shore of Burnt Coat Island and 1¼ miles **S.** by **W.** from Egg Rock beacon.

Whaleback Ledge, bare at half tide and marked by a buoy (spar, red, No. 2), lies 2⅝ miles **SW.** by **W.** ½ **W.** from Egg Rock beacon and about 1⅛ miles **E.** from Saddleback Island. The buoy is placed southeast of the ledge, which is about 150 yards in diameter and has good water all around it.

West Halibut Rock has 2 feet of water over it and lies a little over 1¾ miles **NW.** by **W.** ¾ **W.** from the northern end of Marshall's Island. The rock is marked by a buoy (spar, red and black horizontal stripes); about 400 yards **E NE.** from this is a small rock with 9 feet over it; there is deep water around and between these rocks.

There are numerous rocks and ledges off the entrances to Deer Island Thoroughfare and Merchant's Row; the most important are described under the respective headings.

1 A. *Entering from the Westward.*—*I. Having followed the directions in Section 1A, "Sailing Directions, Deer Island Thoroughfare."*—When Long Ledge buoy (spar, red, No. 2) is 50 yards on the port beam, steer E. ½ N., taking care not to be set to the northward; pass about 300 yards to the northward of Egg Rock beacon and continue the E. ½ N. course, leaving Casco Passage Ledge buoy (spar, red, No. 4) about 200 yards on the port hand.

When up to black spar-buoy No. 7 leave it on the starboard hand and follow the buoys in Casco Passage, leaving the black spar-buoys on the starboard hand and red spar-buoy No. 2 on the port hand. From black spar-buoy No. 1, which should be left about 150 yards on the starboard hand, steer E. ⅛ N. for Bass Harbor Light, and reverse part of the directions in Section 1, page 66.

II. Having followed the directions in Section 1 A, "Sailing Directions, Merchant's Row."—When the spindle on Colby's Ledge bears N., distant about 500 yards, steer NE. by E. ½ E., passing about ⅜ mile to the northward of Southern Mark Island. West Halibut Rock buoy will be left about ½ mile on the starboard hand and Whaleback Ledge buoy the same distance on the port hand. The Woodbury buoy will be left about ¼ mile on the starboard hand and Sunken Egg Rock buoy the same distance on the port hand. When up to Sunken Egg Rock buoy, steer a little more to the northward, and when black spar-buoy No. 7 is made, shape the course so as to leave it about 100 yards on the starboard hand; when up to this buoy follow the directions in the preceding paragraph.

Remarks.—On the E. ½ N. course from Deer Island Thoroughfare, Egg Rock beacon will be a little on the starboard bow; as the beacon is approached haul to the northward so as to leave it 300 yards on the starboard hand. After passing the beacon a sharp lookout should be kept for Casco Passage Ledge buoy, which is left on the port hand. The black buoys marking the south side of the channel of Casco Passage will then be seen a little on the starboard bow.

On the NE. by E. ½ E. course from Merchant's Row the buoys on both sides of the sailing line should be passed as directed above. Egg Rock beacon will be made on the port bow and the entrance to Casco Passage will be ahead. After passing Egg Rock beacon a sharp lookout should be kept for the buoys at the entrance to the passage.

For dangers, see Section 1, preceding.

SAILING DIRECTIONS TO ENTER JERICHO BAY FROM SEAWARD.

These directions carry a least depth of 6 fathoms, which will be found between the northern end of Marshall's Island and Hat Island.

1. Follow the directions in Sections 1 or 1 A, "Sailing Directions, Burnt Coat Harbor," until midway between Green and Brimstone islands, then steer NW. ¼ N.; pass 400 yards to the northward of Ringtown Island and give the extreme northern point of Marshall's Island a berth of at least ⅜ mile. When midway between Hat Island and Halibut Rocks ——

If bound to Eggemoggin Reach steer N. ½ E.; The Woodbury buoy (spar, red and black horizontal stripes) will be left 300 yards on the port hand, and Sunken Egg Rock buoy and Egg Rock beacon will be left well on the starboard hand. Devil's Head will be made on the port bow, and when its highest point bears N. by W., steer for it on the bearing. Pass about midway between Hay Island Ledge buoy (spar, red and black horizontal stripes) and Channel Rock buoy (spar, black, No. 1), and follow the directions in Section 1, "Sailing Directions, Eggemoggin Reach," page 74.

If bound through Deer Island Thoroughfare, steer N. by W. ¼ W.; leave The Woodbury buoy (spar, red and black horizontal stripes) about 350 yards on the starboard hand. Long Ledge and the buoy (spar, red, No. 2) will be made ahead; when 50 yards distant from the buoy, steer W. by N. and follow the directions in Section 1, "Sailing Directions, Deer Island Thoroughfare."

If bound through Merchant's Row, steer W.; pass about 250 yards to the northward of Halibut Rocks and when past them steer about W. by S., heading for Southern Mark Island; West Halibut Rock buoy (spar, red and black horizontal stripes) should be left about 300 yards on the starboard hand. When past this buoy steer about W.; pass about 300 yards north of Southern Mark Island and about 450 yards south of the spindle on Colby's Ledge; then follow the directions in Section 1, "Sailing Directions, Merchant's Row," page 81.

Remarks.—The principal dangers are described on page 77.

Devil's Head when seen from the southward appears as a high, rocky hill with steep, bare faces. It is on the southern end of Hog Island and marks the eastern side of the entrance to Eggemoggin Reach.

DEER ISLAND THOROUGHFARE.†

This thoroughfare, leading from Jericho Bay into East Penobscot Bay, passes between the southern shore of Deer Isle and the numerous islands to the southward. It is one of the chain of inland passages, and is used by vessels bound across Penobscot Bay. The eastern entrance is 1¾ miles W. from Egg Rock beacon and leads south of Long Ledge, which is bare at half tide and marked by red spar-buoy No. 2, off its southern end. A small, bare island (Shabby Island), with a lone ragged tree on it, is a conspicuous mark on the southern side of the entrance; there is a ledge ⅜ mile to the eastward of this island. The western entrance can be distinguished by Mark Island with Deer Island Thoroughfare light-house on its western end.

The channel through this thoroughfare can be easily followed in the daytime, when the buoys can be readily distinguished, and with a leading wind, although it is very narrow—in places not over 75 yards wide. Most of the dangers are buoyed. The least water is on the bar between Moose Island and Thurlow's Island, and it is not safe to pass this point at low water drawing more than 10 feet. Vessels of 16 feet draught have been taken through at high water.

Southeast Harbor lies to the northwestward of the eastern end of the thoroughfare, between Stinson's Neck on the east and Whitmore's Neck on the west. The entrance is easily distinguished and the dangers are marked by buoys. It is an excellent anchorage, and at **Oceanville**, a small town on the western shore, ship chandler's stores, fresh water, and a limited supply of anthracite and bituminous coal can be obtained. Pilots for the thoroughfare can be found here.

Green's Landing is a small town at the head of a shallow cove in the south shore of Deer Isle, near the western entrance of the thoroughfare. It has steamboat communication with Rockland and telegraphic communication with the mainland.

Anchorages.—The best anchorage for vessels bound through the thoroughfare and overtaken by night or bad weather is Southeast Harbor. When overtaken by fog they may anchor anywhere near the channel where they find soft bottom and a suitable depth of water.

Ice closes the thoroughfare and Southeast Harbor for about one month each winter.

Currents.—The tidal currents follow the general direction of the channel and are not strong. The direction of the currents is influenced by the wind; with strong easterly winds both the flood and ebb set to the westward, and with westerly winds they set to the eastward. When not influenced by the wind the flood sets to the eastward and the ebb to the westward, and continues to run about ¾ hour after high and low waters.

SAILING DIRECTIONS, DEER ISLAND THOROUGHFARE.

These directions are good for a draught of 10 feet in the daytime with clear weather, when the buoys and other guides can be seen. Vessels of greater draught can be taken through at high water, but it is advisable to take a pilot.

1. ***Entering from the Eastward.***—Having followed the directions in Sections 1, pages 72–73, 76–77 or 78; when Long Ledge buoy bears **N.**, distant 50 to 100 yards, steer about **W.** by **N.** so as to pass about 75 yards south of Lazygut Ledge buoy (spar, red, No. 4) and 200 yards north of Eastern Mark Island Ledge buoy (spar, black, No. 3). Eastern Mark Island Rock buoy (spar, black, No. 1) will be left a little over ¼ mile on the port hand. When black spar-buoy No. 3 is a little abaft the port beam, steer about **SW.** by **W.** ½ **W.** so as to pass about midway between *Haycock Rock* spindle and *Shelldrake Rock*, the small whitish islet to the northwestward of the spindle. When the spindle bears **E.**, distant about 300 yards, steer about **W.** ½ **S.** so as to leave White Rock and Haskell's Ledge buoys (spar, red, Nos. 6 and 8) on the starboard hand and Bold Island Ledges buoys, eastern and western (spar, black, Nos. 5 and 7), on the port hand; the course leads about 200 yards **S.** of Grog Island.

When the eastern end of Grog Island bears **N.**, steer about **W SW.** ½ **W.** for the middle or highest point of Russ Island, and when *Humpkin's Island*, small rocky islet nearly ½ mile west of Grog Island, bears **N.**, distant about 450 yards, steer about **W.** ¼ **N.** so as to pass north of Russ' Island Ledge buoy (spar, black, No. 9), which should be left close-to, and south of Staple's Ledge buoy (spar, red, No. 12). Leave *Two Bush Islands*, a group of small rocky islets, about 150 yards on the port hand, and *Thurlow's Knob*, the small rocky island off the northeast end of Thurlow's Island, about 100 yards on the port hand. Green's Landing will be seen at the head of the bight north of Two Bush Islands. When past Thurlow's Knob steer about **W SW.** ¾ **W.**; leave Crotch Island Ledge buoy

† Shown on Coast and Geodetic Survey charts: **309**, scale $\frac{1}{40,000}$, price $0.25; and **104**, scale $\frac{1}{80,000}$, price $0.40.

(spar, black, No. 11) on the port hand and Gangway Rock buoy (spar, red and black horizontal stripes) on the starboard hand. Field Ledge buoy (spar, black, No. 13) should be made nearly ahead and left about 70 yards on the port hand; Mark Island will be left about 250 yards on the port hand.

When to the westward of Mark Island, bring Deer Island Thoroughfare light to bear **E.** by **S.** and steer **W.** by **N.** for the entrance to Fox Islands Thoroughfare and follow the directions in Section 1, "Sailing Directions, Fox Islands Thoroughfare."

If bound up to East Penobscot Bay.—When north of Mark Island, steer about **NW.** and leave Mark Island Ledge buoy (spar, red, No. 2) about 700 yards on the port hand. When in the middle of the bay, follow the directions in Section 2, "Sailing Directions, East Penobscot Bay."

1 A. ***Entering from the Westward.***—Having followed the directions in Section 1 A, "Sailing Directions, Fox Islands Thoroughfare," when the bell-buoy off Channel Rock bears **N.**, distant 200 yards, steer **E.** by **S.** for Deer Island Thoroughfare light (see table of lights, page 16). Pass 250 yards **N.** of the light and steer **E NE.** ¾ **E.**; leave black spar-buoy No. 13 about 60 yards on the starboard hand, the red and black horizontal striped spar-buoy on the port hand, and black spar-buoy No. 11 on the starboard hand. When past these buoys continue the course until Thurlow's Knob bears **S.**, then steer **E.** ¼ **S.**; leave red spar-buoy No. 12 on the port hand and black spar-buoy No. 9 on the starboard hand. When Humpkin's Island bears **N.**, steer **E NE.** ½ **E.** to pass about 200 yards **S.** of Grog Island. When the eastern end of Grog Island bears **N.**, steer **E.** ½ **N.**; leave the two black spar-buoys, Nos. 7 and 5, on the starboard hand and the two red spar-buoys, Nos. 8 and 6, on the port hand, heading so as to pass about 125 yards N. of the spindle on Haycock Rock. When this spindle bears **S.**, distant about 300 yards, steer **NE.** by **E.** ½ **E.**, pass to the northward of black spar-buoy No. 3 and bring it to bear **S.**, distant 300 yards, then steer **E.** by **S.**; leave red spar-buoy No. 4 about 75 yards on the port hand and red spar-buoy No. 2 (Long Ledge buoy) about 50 to 100 yards on the port hand; then—

If bound through Casco Passage, follow the directions in Section 1 A, page 78.

If bound to Blue Hill Bay, steer **E.** until within ½ mile of Egg Rock beacon, then steer **NE.** ¾ **N.**, and reverse the directions in Section 1, pages 73 and 72.

If bound to Burnt Coat Harbor, steer **S.** by **E.** ¼ **E.**, heading so as to pass about midway between Hat Island and Halibut Rocks; when on a line midway between them, follow the directions in Section 1 B, "Sailing Directions, Burnt Coat Harbor," page 68.

SAILING DIRECTIONS, SOUTHEAST HARBOR.

These directions lead to the anchorage in 3¼ to 8 fathoms water off the village of Oceanville, and are good for vessels of 20 feet draught.

1. ***Entering from the Eastward.***—Having followed the directions in Section 1, page 72, or Section 1, page 76, until up to the eastern entrance to Deer Island Thoroughfare, when Long Ledge buoy (spar, red, No. 2) bears **N.**, distant 50 to 75 yards, steer **W.** by **N.**; pass about 100 yards south of Lazygut Ledge buoy (spar, red, No. 4), and when this buoy bears well on the starboard quarter steer **NW.** ½ **W.** Pass about 350 yards to the eastward of Channel Rock buoy (spar, red and black horizontal stripes) and the same distance to the eastward of Whale's Back Ledge buoy (spar, black, No. 1). When nearly up to the latter buoy steer more to the northward and anchor in the middle of the harbor, taking care to avoid the small 11-foot spot which lies ½ mile **NE.** ¾ **N.** from the highest point of the Whale's Back.

1 A. ***Entering from the Westward.***—Having followed the directions in Section 1 A, "Sailing Directions, Deer Island Thoroughfare," until past Haycock Rock spindle, which is left on the starboard hand, when about midway between Eastern Mark Island Ledge buoy (spar, black, No. 3) and Shelldrake Rock, steer **N.** by **W.** ¾ **W.**; pass about midway between Channel Rock and Sheep Island and about 350 yards to the eastward of Whale's Back Ledge buoy (spar, black, No. 1). Anchor as directed in Section 1, preceding.

MERCHANT'S ROW.†

This passage leading from Jericho Bay to East Penobscot Bay and passing between the islands and ledges lying between Deer Island and Isle au Haut, is used by vessels in the winter, when Deer Island Thoroughfare is closed by

† Shown on Coast and Geodetic Survey charts: 309, scale of $\frac{1}{40,000}$, price $0.25; and 104, scale $\frac{1}{80,000}$, price $0.40.

ice, and by heavy draught vessels at all times. It is not so direct as Deer Island Thoroughfare, but the channel is wider, and has a depth sufficient for vessels of the deepest draught. There are numerous ledges and rocks on both sides of this passage, but the principal ones are marked by buoys or spindles, and the channel can be readily followed in clear weather and daylight. The entrance from the eastward is indicated by Southern Mark Island, which can be passed on either side. At the western end is Deer Island Thoroughfare light, the guide into Deer Island Thoroughfare and Merchant's Row, the thoroughfare entrance being north of the light, and the entrance to Merchant's Row south of it.

Prominent objects.—**Southern Mark Island** is about 300 yards long in a **NE.** and **SW.** direction, and about 150 yards wide; its appearance from the northward and eastward is a small brown island about 30 feet high and covered with grass; it lies 2¾ miles **W. ½ N.** from the northern point of Marshall's Island. **Saddleback Island** is the large hilly island, with scattered trees, about 1½ miles north of Southern Mark Island; it has several smaller islands around it. **McGlathery Island**, large, covered with trees, with a hill 100 feet high near its southern end, lies about **W NW.** from Southern Mark Island; the channel passes just south of it. **Farrel's Island**, near the western part of the row, is partly wooded; it lies about 1 mile **SE.** from Mark Island (Deer Island Thoroughfare light-house). About ½ mile **SW.** from Farrel's Island is **Sparrow Island**, a grassy island about 25 feet high. The channel passes between them and then leads to the northwestward, south of Deer Island Thoroughfare light. **Mark Island**, at the western entrance of Merchant's Row, is covered with a growth of low trees, which partly hide the light-house on its western end when approaching from the eastward.

SAILING DIRECTIONS, MERCHANT'S ROW.

These directions, if closely followed, will lead in the best water; a least depth of 5¼ fathoms will be found to the southward of Mark Island. Strangers should not attempt to pass through the row except in the daytime and with clear weather.

1. *Entering from the Eastward.*—Having followed the directions in Sections 1, pages 76–77 or 78, when the spindle on Colby's Ledge bears **N.**, distant about 500 yards, steer **W. ½ N.** and leave Gooseberry Island about 250 yards on the starboard hand. When the southwestern point of McGlathery Island is clear of Round Island, bearing about **N NE.**, steer **W NW. ¼ W.**, with Sparrow Island a little on the port bow. When the eastern end of Farrell's Island is in range with the eastern or highest bare hill on Thurlow's Island, bearing about **NE.**, steer **N NW. ¾ W.**, heading about 400 yards to the westward of Deer Island Thoroughfare light. When about midway between Mark Island and Scraggy Island—

If bound through Fox Islands Thoroughfare, steer **W NW. ¾ W.** about 4½ miles, when the bell-buoy off Channel Rock should be about 150 yards on the starboard beam; then follow the directions in Section 1, "Sailing Directions, Fox Islands Thoroughfare," page 83.

If bound up East Penobscot Bay, steer about **NW. ½ W.**, leaving Mark Island Ledge buoy (spar, red, No. 2) about 150 yards on the starboard hand, and when in the middle of the bay, follow the directions in Section 2, "Sailing Directions, East Penobscot Bay," page 87.

Remarks.—On the **W. ½ N.** course, when passing to the southward of McGlathery Island, as soon as the southwestern point of the island is opened so as to show the whole of Round Island, just to the westward, the course should be changed to **W NW. ¼ W.** On this course the spindle on Barter's Island Ledges should be given a berth of at least 200 yards on the starboard hand; Harbor Island Ledge buoy should be left on the port hand. Mid Channel Ledge buoy can be left on either hand by giving it a berth of 200 yards; the sailing line passes south of it. **Ewe Island**, small and round, covered with trees on top, lies to the southwestward of the buoy; to the eastward of this island a good passage leads to the southward, which is used by vessels bound to Carver's Harbor or to sea. When the eastern end of Farrel's Island bears **N.**, Mark Island will open to the westward of Farrel's Island. Vessels may stand into East Penobscot Bay by passing about 350 yards north of Sparrow Island and steering **W. ¾ N.**, taking care not to be set to the northward on to The Brown Cow. On the **N NW. ¼ W.** course Mark Island will be on the starboard bow and Scraggy Island, low and wooded, will be on the port bow. On the **W NW. ¾ W.** course the entrance to Fox Islands Thoroughfare will be ahead, and **Widow's Island**, hilly, with large brick building, will be made a little on the starboard bow.

Dangers.—**Colby's Ledge**, bare at half tide, is on the north side of the channel, about 1 mile **W NW.** from the northern end of Southern Mark Island. The ledge is marked by a red iron spindle with wheel on top.

Colby's Pup, a small ledge with 3 feet over it, lies ½ mile **S.** by **W.** from the spindle on Colby's Ledge; it is marked by a buoy (spar, red and black horizontal stripes) placed east of the ledge, which is about 150 yards in diameter. Keeping Halibut Rocks open a little to the northward of Southern Mark Island clears this ledge.

Middle Ledge, showing partly bare at low water, is about 200 yards long in a **NW.** and **SE.** direction, and lies a little over ¾ mile **S.** from Gooseberry Island and about ⅝ mile **SW.** by **W. ¼ W.** from Colby's Pup. There are two spots with 16 and 18 feet over them, about 400 yards to the northward and northwestward of this ledge.

Barter's Island Ledges lie about ⅝ mile **S.** from Wreck Island, and about ½ mile **W.** by **N.** from the southern end of McGlathery Island; they are about 225 yards in diameter, partly bare at low water, and marked by a red iron spindle with wheel on top.

Harbor Island Ledge is awash at extreme low tides and lies ¼ mile **N.** from the western end of **Harbor Island,** the small prominent bare island **W.** of Merchant's Island. The ledge is about 125 yards long in an **E.** and **W.** direction, and is marked off its northern side by a buoy (spar, black, No. 1).

Mid Channel Ledge is small, with a depth of 14 feet over it, lying about 600 yards **NE.** by **N.** from Ewe Island; it is marked by a buoy (spar, red and black horizontal stripes), and can be avoided by giving the buoy a berth of 200 yards.

A ledge, showing bare at half tide, makes out 300 yards to the eastward from Scraggy Island.

West Mark Island Ledge, a little over ⅝ mile **NW.** by **W.** ¼ **W.** from Deer Island Thoroughfare light-house, has 6 feet of water on it, and is marked by a buoy (spar, red, No. 2), which is left on the starboard hand by vessels bound to the westward, or up East Penobscot Bay.

The Brown Cow or **Channel Rock** is small and just bare at high water, with shoal water extending about 200 yards to the northward and southward from it, and lies ¾ mile **W.** ½ **S.** from the western end of Scraggy Island.

Sparrow Island Ledges is a cluster of ledges lying 400 to 800 yards to the westward of the island, and bare at half tide. There is a 16-foot spot 200 yards to the northward, and several spots with 13 to 15 feet over them between these ledges and Sparrow Island.

1 A. ***Entering from the Westward.***—Having followed the directions in Section 1 A., "Sailing Directions, Fox Islands Thoroughfare," when the bell-buoy off Channel Rock bears **N.**, distant 150 yards, steer **E SE.** ¾ **E.**, heading so as to pass about ¼ mile to the southward of Deer Island Thoroughfare light-house. When the light is on the port beam, steer **S SE.** ½ **E.** and pass midway between Farrel's and Sparrow islands. When the eastern end of Farrel's Island bears **NE.** and is in range with the highest bare hill on Thurlow's Island, steer **E SE.** ¼ **E.**; leave Mid Channel Ledge buoy on the port hand, Harbor Island Ledge buoy on the starboard hand, and Barter's Island Ledges spindle on the port hand. When the southern end of McGlathery Island is in range with the eastern end of Round Island, steer **E.** ½ **S.**; pass about 250 yards south of Gooseberry Island, and when the spindle on Colby's Ledge bears **N.**, distant 500 yards, follow the directions in Section 1 A, page 78.

For Remarks and Dangers see Section 1, preceding.

FOX ISLANDS THOROUGHFARE.†

This thoroughfare, leading from East Penobscot Bay to West Penobscot Bay, between North Haven and Vinal Haven islands, is one of the chain of inshore passages commencing at Bass Harbor and ending at Whitehead. It is about 7 miles long, and the channel has a least width of about 150 yards in several places; the principal dangers are marked by buoys and spindles, which can be easily followed in the daytime with clear weather. The least depth in the channel is 19 feet at low water, but the thoroughfare is seldom used by vessels of over 14 feet draught.

Carver's Cove, in the south shore of the thoroughfare near its eastern end, is an excellent anchorage and convenient for vessels wind bound in East Penobscot Bay or passing through the thoroughfares; it affords shelter from all winds in 14 to 21 feet of water, good holding ground. The anchorage is **S SW.** from Widow's Island.

Kent's Cove, in the north shore of the thoroughfare, north of Widow's Island, is a good anchorage with 12 to 42 feet of water, good holding ground. **Goose Rocks light-house** (see table of lights, page 16) is the prominent guide for entering this cove either in the daytime or at night.

Waterman's Cove makes into the north shore west of Kent's Cove; it is a good anchorage, the water shoaling gradually from 18 feet at the entrance to 5 feet near its head, where a narrow channel leads into a shallow cove called the **Cubby Hole.**

Seal Cove is a large, deep cove making into the south shore west of Zeke's Point; the entrance near the western shore has good anchorage in 14 to 36 feet of water.

Perry's Cove is a long, narrow arm making in to the westward on the west shore of Seal Cove; it is of no importance as an anchorage.

Southern Harbor makes to the northeastward between the Dumpling Islands and Amesbury's Point, near the western end of the thoroughfare. It has good anchorage in 19 to 22 feet of water, soft bottom, in the middle of the harbor; the water shoals gradually toward its head.

The village of **North Haven**, on the north shore of the thoroughfare, west of Seal Cove, has several wharves, but is of no commercial importance; it has steamboat communication with Rockland.

† Shown on Coast and Geodetic Survey charts: **311a**, scale $\frac{1}{20,000}$, price $0.20; **104**, scale $\frac{1}{80,000}$, price $0.40; and in part on charts **309** and **310**, scale of each $\frac{1}{40,000}$, price of each $0.25.

Prominent objects.—Widow's Island Hospital is a large brick structure on Widow's Island; it will be easily distinguished, as it is the only prominent building at the eastern entrance. **Widow's Island** is about 25 feet high, with grassy slopes. **Goose Rocks light-house** is on the north side of the channel, north of Widow's Island; it is the guide for the eastern entrance of the thoroughfare and for the anchorage in Kent's Cove. **Brown's Head light** marks the entrance to the thoroughfare from the westward (see table of lights, p. 18). **Fiddler's Ledge beacon** (large, gray stone), bearing **W.** by **S.** from Brown's Head light-house, is a prominent mark when approaching from the westward.

Tidal currents.—The currents are not strong; they meet at Iron Point, in the middle of the thoroughfare, the flood setting in from both ends and the ebb setting out. The mean rise and fall of tides is 10 feet (see table of tides, page 15).

SAILING DIRECTIONS, FOX ISLANDS THOROUGHFARE.

1. ***Entering from the Eastward.***—Having followed the directions in Sections 1, Sailing Directions, Deer Islands Thoroughfare, or Merchant's Row, or, having stood into the entrance of the thoroughfare from East Penobscot Bay, when the bell-buoy off Channel Rock bears **N.**, distant about 150 yards, steer **NW. ½ W.**, keeping Goose Rocks light a little on the starboard bow. Leave Bradstreets Rock buoy (spar, black, No. 1) about 150 yards on the port hand, and pass about 200 yards south of Goose Rocks light, and when it bears **N NE.** change the course to **W.** by **N.** Pass about 100 yards south of Fish Point Ledge buoy (spar, red, No. 4) and steer about **SW.** by **W. ⅛ W.** On this course Iron Point Ledge spindle (iron, black) should be kept a little on the port bow, and should be left about 75 yards on the port hand; Grindstone Ledge buoy (spar, red, No. 6) will be made on the starboard bow, and as soon as the spindle is well abaft the beam change course to **W.** by **S.**

When red spar-buoy No. 6 bears **N.**, distant about 100 yards, steer **W NW. ½ W.**; follow the southern shore, giving it a berth of 200 yards, and steer about **NW.** by **W.** Lobster Ledge buoy (spar, red, No. 8) will be left about 150 yards on the starboard hand, and Post Office Ledge buoy (spar, red and black horizontal stripes) about 75 yards on the starboard hand. When Calf Point, the western point at entrance to *Young's Cove*—on the southern shore about ⅝ mile to the westward of the steamboat wharf at North Haven—is abeam, distant about 225 yards, steer **W.** Pass about 100 yards north of Young's Point spindle (iron, black, with vanes on top showing like a cylinder), and when it is well abaft the beam, steer about **W SW.** Pass 175 yards south of Calderwood's Rock buoy (spar, red and black horizontal stripes) and about 250 yards north of Fox's Ears spindle (iron, red, cage on top). When the spindle is in range with Brown's Head light, bearing about **S. ¾ E.**, steer **SW. ¾ W.**, heading so as to pass ⅓ mile to the eastward of the stone beacon on Fiddler's Ledge. Round Fiddler's Ledge beacon, leaving it about ¼ mile on the starboard hand, and when it bears **N.**—

If bound to Rockland, follow the directions in Section 1, "Sailing Directions, Rockland Harbor."

If bound through Muscle Ridge Channel, steer **W SW. ¾ W.**; pass to the northward of Fox Islands Thoroughfare bell-buoy and continue the course across West Penobscot Bay. Pass 200 yards south of Sheep Island Shoal buoy (spar, black, No. 1) and leave Northwest Ledge and Emery's Ledge buoys (spar, red and black horizontal stripes) well on the port hand. When past Emery's Ledge buoy, steer more to the southward; pass 150 yards east of Ash Island beacon (wooden tripod, white and brown) and follow the directions in Section 1A, "Sailing Directions, Muscle Ridge Channel."

Remarks.—Standing into the entrance of the thoroughfare, the hospital, a large brick building on Widow's Island, will be a conspicuous mark; Channel Rock, marked by a day beacon, will show prominently. Goose Rocks light may be steered for on any bearing between **NW. ¾ N.** and **NW. ¾ W.**, taking care to leave Bradstreets Rock buoy on the port hand. At night the dangers in the entrance to the thoroughfare are avoided by keeping in the white rays of Goose Rocks light. The shores of Widow's Island should be given a berth of at least 200 yards. Vessels seeking an anchorage in Carver's Cove stand in south of Widow's Island and anchor in the middle of the cove; the water shoals gradually toward its head.

After passing Goose Rocks light, vessels desiring to anchor in Kent's Cove should give the light a berth of 200 yards on the starboard hand, and steer about **N.** Anchor according to draught; the water shoals gradually to the northward.

Approaching Iron Point Ledge spindle, on the **SW.** by **W. ⅛ W.** course, care must be taken to keep clear of Dobbin Rock (8½ feet of water) which lies about 200 yards **N.** by **E. ½ E.** from the spindle. The sailing line passes south of this rock. When past Young's Point spindle, Sugar Loaves, a high, dark, rocky ledge, will show prominently to the southwestward; there is a good channel on both sides of this ledge, but vessels should not pass between Fox's Ears spindle and Sugar Loaves.

Standing on the **SW. ¾ W.** course Fiddler's Ledge beacon will be on the starboard bow and Dogfish Ledge spindle on the port bow. At night the white rays of Brown's Head light lead clear of all dangers into West Penobscot Bay.

1 A. *Entering from the Westward.*—Approaching the western entrance to Fox Islands Thoroughfare, bring Brown's Head light to bear **E NE. ½ E.** and steer for it on this bearing. When it is about ⅜ mile distant ahead, steer **NE. ½ E.**, passing midway between Brown's Head and Sugar Loaves; Calderwood's Rock buoy (spar, red and black horizontal stripes) should be left about 200 yards on the port hand. From this buoy steer about **E NE. ½ E.**; pass about 100 yards north of the spindle off Young's Point and steer **E.** When Calf Point bears **S SW.**, distant 250 yards, steer **SE.** by **E.**, and give the southern shore a berth of about 200 yards.

When Lobster Ledge buoy (spar, red, No. 8), which is left on the port hand, is abeam, steer **E SE. ½ E.**, and pass about 100 yards south of Grindstone Ledge buoy (spar, red, No. 6). When abreast this buoy, steer **NE.** by **E. ¾ E.**, passing about 75 yards to the westward of Iron Point Ledge spindle. When up to Fish Point Ledge buoy (spar, red, No. 4), which is left about 100 yards on the port hand, steer **E.** by **S.** until abreast of Goose Rocks light, then steer **SE.** by **E.**, leaving Bradstreets Rock buoy (spar, black, No. 1) about 100 yards on the starboard hand and pass south of the bell-buoy off Channel Rock. From this buoy—

If bound through Deer Islands Thoroughfare, or Merchant's Row, follow the directions under Sections 1 A, pages 80 or 82.

Remarks.—Immediately after passing the spindle on Iron Point Ledge do not go anything to the northward of the course given until Iron Point is well abaft the beam, when Dobbin Rock will be passed.

PENOBSCOT BAY.†

This is the largest and most important of the many indentations on the coast of Maine. It is about 20 miles wide from Isle au Haut on the east to Whitehead on the west, and is nearly 28 miles long from its entrance to the mouth of the Penobscot River. A chain of large and small islands divides it into two parts known as East and West Penobscot bays; the southern part of East Penobscot Bay is known as **Isle au Haut Bay.** Numerous harbors indent its shores, those of the most importance being Rockland, Rockport, Camden, and Belfast on the western shore, and Castine on the eastern. The larger towns and villages on the islands have frequent water communication with some one of the above ports.

The sea approaches to the bay are well marked by the light-houses on Monhegan Island and Matinicus Rock, and the entrances by Saddleback Ledge light on the east and Whitehead light on the west sides of the bay. There are innumerable sunken rocks and ledges in this bay; only those near the tracks of commerce will be noticed. The harbors are well lighted and the more important dangers are indicated by buoys or beacons, making the navigation perfectly easy in clear weather. A large number of coasting and some foreign vessels enter the bay, particularly during the summer months. In winter many of the harbors are obstructed by ice and the Penobscot River is sometimes entirely closed by it. The thoroughfares are not frequently obstructed by ice and are much used in the winter by vessels bound along the coast. A stranger can pass through them with good charts and a fair wind, otherwise it is advisable to take a pilot. (See also pages 12–14.)

Pilots for Penobscot Bay can be found to the eastward at Southwest and Bass harbors. Vessels bound through the inside passages sometimes take a pilot at Calais or Eastport. Vessels from the westward if bound into Penobscot Bay take a pilot at Monhegan; if bound through the inside passages, at Whitehead or Seal Harbor. Persons who are reliable pilots can frequently be found on fishing craft and small coasters, but there are no regular licensed pilots for these waters except captains of tow-boats.

EAST PENOBSCOT BAY†

is the part of Penobscot Bay which lies to the eastward of Vinal Haven, North Haven, and North and South Islesboro; between Isle au Haut and Vinal Haven Island, its southern end, it is called **Isle au Haut Bay.** The islands in East Penobscot Bay have numerous coves and small harbors, but few of these are available anchorages, some on account of their depth and others on account of the numerous dangers which obstruct their entrances. East Penobscot Bay is entered from the eastward through Eggemoggin Reach, Deer Island Thoroughfare, and Merchant's Row, and from the southward between Isle au Haut and Vinal Haven Island. **Saddleback Ledge light** (see table of lights) is the guide to this entrance. Numerous unmarked ledges lie to the westward of the southwestern end of Isle au Haut and off the western entrance to Merchant's Row and Deer Island Thoroughfare. To the northeastward of North Haven Island there are numerous islands and ledges.

The channel to the head of Penobscot Bay leads to the eastward of **Eagle Island**, marked by a light-house (see table of lights), and passes between the islands in a **N NW.** direction to Cape Rosier; this channel has a least depth of 8½ fathoms and is comparatively free from dangers.

† Shown in parts on Coast and Geodetic Survey charts: **309, 310, 311**, scale of each, $\frac{1}{40,000}$, price of each, $0.25; and on **104**, scale $\frac{1}{80,000}$, price $0.40.

Head Harbor is a small bight in the south shore of Isle au Haut, just west of Eastern Head; it is exposed to southerly winds and only used by fishermen. The bottom is rocky except in the northwestern part, where the depth is from 4¾ to 9 fathoms.

Moore's Harbor is a cove on the western side of Isle au Haut, about 2½ miles above Western Ear. This harbor has many outlying ledges off the entrance and is an unsafe anchorage.

Isle au Haut Thoroughfare is on the western side of Isle au Haut, between it and Kimball's Island; though called a thoroughfare it has a bar near its eastern entrance, dry at low water and extending from Isle au Haut to Kimball's Island. It has a greatest width of ¼ mile at its western end and is well sheltered from all winds with a good though small anchorage in 5 to 8 fathoms water. A buoy and spindle mark the two principal dangers.

Carver's Harbor is on the south side of Vinal Haven Island (see heading).

Robert's Harbor, about 1¾ miles east of Carver's Harbor on the southeastern side of Vinal Haven Island, is about ⅜ mile in diameter and much obstructed at the entrance by rocks and ledges; it is unsafe for strangers.

Ayrey's Cove is a small cove full of dangers, just to the northward of Robert's Harbor; it is connected with the latter by a narrow channel with 1 foot at low water.

Winter Habor, Seal Bay, and **Smith's Cove** make into the northeastern part of Vinal Haven Island, south of the eastern entrance to Fox Islands Thoroughfare; they are of no commercial importance, and not safe for a stranger to enter.

Fox Islands Thoroughfare (see heading, page 82).

Carver's Cove and **Kent's Cove** are two excellent anchorages and easily entered by strangers, assisted by a chart or closely following the directions given under heading "Fox Islands Thoroughfare."

Little Thoroughfare is a passage into Fox Islands Thoroughfare north of the main entrance; it is not buoyed, and strangers should not attempt to use it.

Merchant's Row, north of Isle au Haut (see heading, page 80.)

Deer Island Thoroughfare, south of Deer Isle (see heading, page 79).

Burnt Cove and **Crockett's Cove** are two small coves lying between Fifields Point and Bear Island, on the southwestern side of Deer Isle; they are of no importance as anchorages.

Southwest Harbor is on the western side of Deer Isle, about 4 miles north of Deer Island Thoroughfare light-house; it is about ½ mile wide at the entrance and 1 mile long, with anchorage in 3 to 5 fathoms water, but is not much used as it is open to the southward. The village of **Sunset** is on the eastern shore of the harbor.

Northwest Harbor, on the northwestern side of Deer Isle, is about ⅜ mile wide and 1¼ miles long in a **SE.** and **NW.** direction. A large part of its upper end is bare at low water, but below and abreast the steamboat wharf good anchorage will be found for small craft in 13 to 17 feet water, soft bottom; the harbor is exposed to northwesterly winds, and is not used by vessels seeking shelter. The village of **Deer Isle**, near the head of the harbor, has steamboat communication with Rockland and Ellsworth, and also telegraphic communication with the mainland. Vessels of 7 feet draught have been taken up to the village, but they lie aground at low water; there is 7 feet at low water at the end of the steamboat wharf. Pilots for the harbor can be found at Green's Landing, in Deer Island Thoroughfare. During January and February it is closed by ice. For sailing directions see Sailing Directions for East Penobscot Bay, Section 2, paragraph VI.

Eggemoggin Reach enters from the eastward north of Little Deer Isle (see heading, page 73).

Islesboro Harbor is an open bight in the northeastern side of South Islesboro, about **W.** by **N.** from the southwestern point of Cape Rosier; it affords good shelter in westerly winds, and has a depth of 7 fathoms. Off the southern point, at the entrance, is a ledge which is bare at half tide, and marked by two buoys. Strangers should pass to the northward of these and anchor, giving the western shore a berth of 600 yards.

Sabbath Day Harbor is a small cove in the southeastern side of North Islesboro, and a little over 2 miles to the northward of **Hewes Point**, the high point on south side of entrance to Islesboro Harbor. It is open to the southward and affords anchorage for small vessels in 6 to 18 feet of water. There are several summer houses on its shores.

Castine Harbor, Bagaduce River, and **Smith's Cove**, making into the eastern shore, about 3¾ miles north of Cape Rosier, are fully described under heading "Bagaduce River and Castine Harbor."

Parker's Cove on the east side of North Islesboro and **W SW.** from Dice's Head light-house, is a small shallow cove, only used as an anchorage by small vessels well acquainted with the locality.

For Stockton Harbor, see West Penobscot Bay.

SAILING DIRECTIONS, EAST PENOBSCOT BAY.

These directions are good for vessels of the heaviest draught, and lead in the best water to the entrance of Penobscot River.

1. ***Approaching and Entering.—From the Eastward.***—Passing ½ mile north of Mt. Desert Rock, steer **WNW.** ⅝ **W.** and pass 1¾ miles south of Isle au Haut. Or, with Long Island Head bearing **N.**, distant about 1 mile, steer **W.** ⅞ **S.** and pass about 1½ miles south of Isle au Haut.

When the spindle on Roaring Bull Ledge bears **N.**, distant about $\frac{3}{4}$ mile, and Saddleback Ledge light bears **NW.** $\frac{1}{2}$ **W.**, steer for the light and bring it to bear **W.**, distant about $\frac{3}{8}$ mile; then follow the directions in Section 2.

Or, bring Saddleback Ledge light to bear between **NW.** $\frac{1}{2}$ **W.** and **N.** and steer for it; pass about $\frac{3}{8}$ mile to the eastward of the light and follow the directions in Section 2.

Remarks.—Approaching the southern entrance to East Penobscot Bay, **Isle au Haut**, large, high, and well wooded island on the east side of the entrance, will be easily recognized. **Eastern Ear** is the small island to the eastward of the southeastern point of Isle au Haut, and **Western Ear**, the small island off its southwestern point. Roaring Bull Ledge spindle is hard to distinguish when approaching from the southward. Isle au Haute should be given a berth of $1\frac{1}{4}$ miles until Saddleback Ledge light comes on the bearing. When south of Isle au Haut, Saddleback Ledge light-house will be seen to the northwestward in the middle of the entrance to the bay, which is here also known as Isle au Haut Bay. Numerous small islands will be seen to the westward of the light and south of Vinal Haven Island. **Seal Island**, the easternmost of the outside islands off Penobscot Bay, will be seen in the distance to the southwestward, on a clear day.

Dangers.—Approaching East Penobscot Bay from the eastward, the small islands to the eastward of Isle au Haut should not be approached closer than $1\frac{1}{4}$ miles while to the southward of them.

Eastern Ear Ledge, bare at low water, lies about $\frac{1}{2}$ mile **S.** by **E.** $\frac{1}{2}$ **E.** from the eastern end of Eastern Ear; it is not marked, but the sea breaks on it at all times.

Cape Ann Ledge has 2 spots with 4 and 9 feet over them, and lies about $\frac{3}{8}$ mile **S.** by **W.** from the southern point of Eastern Head. The ledge is not marked; the sailing line passes about 1 mile to the southward of it.

Roaring Bull Ledge, bare at half tide and marked by a spindle (iron, red) lies about $1\frac{1}{4}$ miles **SW.** $\frac{1}{2}$ **W.** from Eastern Head, and about $1\frac{1}{8}$ miles **SE.** from Western Ear. There is good water around this ledge, but strangers are advised to keep well to the southward of it.

Western Ear Ledge, bare at half tide, lies nearly $\frac{1}{4}$ mile to the southward of Western Ear. The sailing lines pass well to the southward of this ledge.

The Washers, Black Ledges, Big Brewster, and **Keeler's Rock** are an irregular cluster of rocks and islets extending $\frac{5}{8}$ mile to the westward from Western Head; some of them are bare at all times and others at low water.

The Brandies are three small bare rocks, the westernmost of the ledges making off to the westward from Isle au Haut. This ledge lies 2 miles **E.** $\frac{1}{4}$ **N.** from Saddleback Ledge light-house, and about $1\frac{1}{8}$ miles off the western shore of Isle au Haut; vessels should not pass to the eastward of it.

Saddleback Ledge is a small, dark, rocky islet in the middle of the entrance to East Penobscot Bay, about 3 miles **NW.** by **W.** $\frac{1}{2}$ **W.** from Western Ear. It is marked by **Saddleback Ledge light** (see table of lights, page 16), which should be given a berth of at least 350 yards when passing.

1 A. ***Approaching and Entering.—From the Southwestward.***—Passing about $\frac{3}{4}$ mile south of Matinicus Rock, when the lights bear **N.** steer **NE.** by **E.** about 9 miles; Saddleback Ledge light will then bear **N.** by **E.**, and the eastern end of Seal Island will be off the port beam, distant $\frac{3}{4}$ mile. From this position, a **N.** by **E.** $\frac{1}{4}$ **E.** course will lead about $\frac{5}{8}$ mile to the eastward of Seal Island, and about $\frac{3}{8}$ mile to the eastward of Saddleback Ledge light; when this light bears **W.**, about $\frac{3}{8}$ mile distant, follow the directions in Section 2.

Note.—Vessels coming from the westward, and bound to Castine or Eggemoggin Reach, will find it to their advantage to use the directions for West Penobscot Bay.

Remarks.—The **NE.** by **E.** course leads south of Wooden Ball and Seal islands, and the ledges between them. **Seal Island**, the easternmost, is even in outline and presents no marked features. The **N.** by **E.** $\frac{1}{4}$ **E.** course passes midway between the eastern end of Seal Island and Three Fathom Ledge. Saddleback Ledge light will be a little on the port bow. **Eastern Ledge** makes out about $\frac{1}{4}$ mile from the eastern end of Seal Island, and **Three Fathom Ledge**, which is small, lies $1\frac{3}{8}$ miles **ENE.** $\frac{3}{4}$ **E.** from the eastern end of Seal Island; these are the only dangers that require attention, and they can be avoided by passing from $\frac{1}{2}$ to 1 mile to the eastward of the eastern end of the island, or giving it a berth of $1\frac{1}{4}$ miles.

1 B. ***Approaching and Entering.—From the Westward.***—Pass about 1 mile south of Monhegan Island and steer **E.** by **N.**; this course made good about 17 miles leads to within 2 miles of the northern end of Matinicus Island and about $\frac{1}{2}$ mile south of Foster's Ledges. When Foster's Ledges buoy bears $\frac{1}{2}$ mile distant on the port beam, steer **NE.** by **E.** $\frac{1}{2}$ **E.**; this course made good $13\frac{1}{4}$ miles leads $\frac{3}{8}$ mile south of Saddleback Ledge light. Round the light at this distance, and when it bears **W.** follow the directions in Section 2.

Remarks.—The **E.** by **N.** course leads about 4 miles south of Metinic Green Island and Large Green Island. The northern end of Matinicus Island should be made ahead and kept on the bearing **E.** by **N.** At night Marshall's Point and Whitehead lights will be sighted off the port beam and Matinicus Rock light off the starboard bow. Foster's Ledges buoy should be made on the port bow and left $\frac{1}{4}$ mile on the port beam.

Standing on the **NE.** by **E.** $\frac{1}{2}$ **E.** course from this buoy, the northern end of Matinicus Island and the small islands to the eastward should be left about $\frac{7}{8}$ mile on the starboard hand. The highest point of Isle au Haut will be a

little on the starboard bow, and Saddleback Ledge light will be made a little on the port bow. The sailing line passes well to the southward of the islands and ledges lying south of Vinal Haven Island.

Dangers.—**Gull Rook Ledge** has 3¾ fathoms over it, and lies 1 mile **S SE.** from Monhegan light-house, and nearly ⅝ mile from the shore of the island. To avoid this ledge give the southern end of the island a berth of over 1 mile.

Haddock Ledge is small, with 13 feet of water over it, and lies 7½ miles **E NE.** ¾ **E.** from Monhegan light-house, and 2½ miles **SW.** ¼ **S.** from Metinic Green Island; it is not marked. The sailing line passes nearly 2 miles south of it.

Pigeon Ground is an irregular shoal with depths on it varying from 3½ to 7 fathoms; it extends about 2 miles **E NE.** and **W SW.**, and is 2 miles to the southward of Large Green Island. There is deep water between the two shoalest parts of this shoal. The sailing line passes about 1¼ miles south of it.

Foster's Ledges are about 500 yards in diameter, have 6 feet to 6 fathoms of water over them, and are marked by a buoy (spar, red and black horizontal stripes) placed south of the shoalest part. These ledges lie 2⅞ miles **W.** ¼ **N.** from the northern point of Matinicus Island, and 2 miles **NW.** ½ **N.** from **South Point**, the southwestern point of the island.

Bantam Ledge is a small ledge bare at half tide, lying 2¼ miles **W SW.** ½ **W.** from South Point on Matinicus Island, and 2¼ miles **S SW.** from Foster's Ledges. It is marked by a buoy (spar, red and black horizontal stripes) placed 100 yards south of the ledge. There is good water on all sides.

Zephyr Rock and **Zephyr Ledges** are a number of shoal spots, some showing bare at low water, which extend nearly ¾ mile in a **NE.** direction from **No Man's Land**—the easternmost of the islands off the northern end of Matinicus Island.

Rocks and **ledges** extend out in an **E NE.** direction 1¾ miles from the northern end of Matinicus Island.

Bay Ledge is small, showing bare at low water, and lies 3½ miles **S.** by **W.** ½ **W.** from Heron Neck light-house, and 6⅝ miles **W.** by **S.** from Saddleback Ledge light-house; it is marked by a buoy (nun, red, No. 2) off the southwestern side of the dry part of the ledge, and can be avoided by giving the buoy a berth of more than ¼ mile.

Snippershan is a shoal with a least depth of 6 fathoms on which the sea sometimes breaks; it lies 4¼ miles **SW.** ½ **S.** from Saddleback Ledge light-house and 3⅜ miles **N.** ⅝ **W.** from the eastern end of Seal Island. There is from 25 to 50 fathoms of water all around this ledge.

2. ***From Saddleback Ledge light to Cape Rosier.***—I. When Saddleback Ledge light bears **W.**, distant about ⅜ mile, steer **N.** ⅝ **E.**; this course made good for 12½ miles will lead ¼ mile east of Eagle Island light. When the light bears **W.**, distant about ¼ mile, steer **N NW.** and give the islands on the port hand a berth of at least ¼ mile. When Green Ledge, small, low, grassy island, bears **E.**, distant about ½ mile, steer **N.** by **E.** ½ **E.**, and follow the directions in Section 3.

II. *If desiring to enter Merchant's Row*, bound to the eastward.—When Saddleback Ledge light bears **SW.** ½ **S.**, steer **NE.** ½ **N.**, keeping it on that bearing. Pass a little over ¼ mile to the westward of Kimball's Rock, and when it bears abeam steer **NE.** ½ **E.**; leave Ram Island Sunken Ledge buoy (spar, red and black horizontal stripes) 300 yards on the port hand, and when Ewe Island is open to the eastward of Hardwood Island, bearing about **N.** by **E.** ½ **E.**, steer **N NE.** ¼ **E.** Pass midway between Merchant's and Hardwood islands and about 300 yards to the eastward of Ewe Island. When Mid Channel Rock buoy (spar, red and black horizontal stripes) bears just forward of the port beam, distant about 350 yards, steer **E SE.** ¼ **E.** and follow the directions in Section 1A, page 82.

III. *If desiring to enter Fox Islands Thoroughfare.*—When on the **N.** ⅝ **E.** course about 3¼ miles above Saddleback Ledge light and Kimball's Head is on the starboard beam, steer **N NW.** ¼ **W.** Give the shore of Vinal Haven Island a berth of about ½ mile, and when Goose Rocks light bears between **NW.** ¾ **N.** and **NW.** ¾ **W.**, steer for it, and follow the directions in Section 1, page 83.

Note.—Vessels entering Fox Islands Thoroughfare at night should anchor in Kent's Cove. Keeping in the white rays of Goose Rocks light will lead clear of the dangers in the entrance to the thoroughfare.

IV. *If desiring to enter Deer Island Thoroughfare.*—When on the **N.** ⅝ **E.** course Deer Island Thoroughfare light bears **E.** ½ **N.**, steer for it. Pass about 250 yards north of the light and follow the directions in Section 1A, page 80.

V. *If desiring to pass into West Penobscot Bay by the passage north of North Haven Island.*†—On the **N.** ⅝ **E.** course, when the highest part of *Babbidge Island*—the island on north side of entrance to Fox Islands Thoroughfare—bears **W.** by **S.**, steer **N.** by **W.** ¼ **W.** for the southwestern end of Eagle Island. Leave *Bald Island*—small, high rocky island—about ¼ mile on the port hand, and when the southwestern end of Eagle Island is distant ¼ mile, steer **NW.** by **W.** ¾ **W.** On this course *Grass Ledge*—low, rocky islet surrounded by ledges—should be left nearly ¼ mile on the port hand,

† This passage is generally used in the winter when Fox Islands Thoroughfare is closed by ice, but a stranger should not attempt it except in the daytime with clear weather.

and *Oak Island*—lying 1 mile **W NW.** ½ **W.** from Grass Ledge—should be left ¼ mile on the port hand. When the northwestern point of Oak Island bears about **SW.** ½ **S.**, steer **W SW.** ⅞ **W.**, passing about midway between the northwestern point of Oak Island and Spoon Island. Leave *Webster's Head*—northernmost point of North Haven Island, 120 feet high—about ⅜ mile on the port hand, and continue the course, which will lead into Rockland Harbor and across West Penobscot Bay.

VI. *If desiring to enter Northwest Harbor.*—When on the **N.** ⅝ **E.** course and Eagle Island light is about 1⅛ miles distant, the southern Porcupine will be on the port beam, distant a little more than ½ mile. From this position steer **NE.**, passing about ½ mile to the eastward of Hardhead Island; bring Hardhead Island to bear **W SW.** ½ **W.** astern, and steer **E NE.** ½ **E.** Leave Eaton's Ledge buoy (spar, red, No. 4) 300 yards on the starboard hand; continue the course a little over ½ mile past the buoy, and then steer **SE.** into the middle of the harbor. Anchor off the steamboat wharf in 14 feet of water, soft bottom.

Remarks.—The **N.** ⅝ **E.** course leads up the middle of the bay; Eagle Island will be made a little on the port bow. On the starboard hand the islands and ledges off the entrances to Merchant's Row and Deer Island Thoroughfare will be seen, and Deer Island Thoroughfare light will be easily distinguished. On the port hand, opposite the light, the entrance to Fox Islands Thoroughfare and Goose Rocks light-house will be seen; the hospital (large brick building) on Widow's Island will be a conspicuous mark. **Bradbury Island**, a high, bold island, thickly wooded, will be a little on the starboard bow. When within 1 mile of the eastern end of Eagle Island care should be taken to keep to the eastward of the red and black horizontal striped spar-buoy, marking a 16-foot spot ⅝ mile south of the light-house. The approach to Northwest Harbor, from the southward, is between Hardhead Island and **Denning's Point**—the northwestern point of Deer Island. The winter passage from East to West Penobscot bays, for vessels prevented by ice from using Fox Islands Thoroughfare, is south of Eagle Island and leads to the westward between Oak Island and Spoon Ledge and along the north shore of North Haven Island.

On the **N NW.** course, **Hardhead Island**—small, bare island about **E NE.** from Eagle Island light-house—is left well on the starboard hand. The sailing line passes to the westward of Middle Rock and Bradbury Island. **Cape Rosier**, a high, dark headland, will be on the starboard bow, and a group of bare islands will be seen to the southward of it. The group of high, partly wooded islands lying to the northwestward of Eagle Island will be left on the port hand and should not be approached closer than ¼ mile. **Green Ledge**—a low, rocky islet covered with grass, the westernmost of the group of islands south of Cape Rosier—will be made on the starboard bow and passed ½ mile distant.

Standing up the bay on the **N.** by **E.** ½ **E.** course, see the remarks under Section 3.

Dangers.—**Brimstone Island** is the largest of a group of small islands lying about 1¾ miles to the westward of Saddleback Ledge light. Many rocks and ledges, some showing bare at half tide, surround these islands. They are avoided by giving Brimstone Island a berth of ¾ mile while to the southward of it and ½ mile while to the eastward.

Diamond Rock Ledge, with 2 feet of water over it, lies nearly ¾ mile **N NE.** from Brimstone Island and is marked by a buoy (spar, black, No. 1) on its northern side.

Saddleback Ledge Shoal is a sunken rock with a least depth of 4 feet over it, lying nearly ⅞ mile **N NW.** ½ **W.** from Saddleback Ledge light-house. It is marked by a buoy (spar, red and black horizontal stripes) placed off the southwestern side of the rock and can be avoided by giving the buoy a berth of at least 250 yards.

Triangle Ledge and **Little Triangle Ledge**, one bare at half tide, the other with 3 feet of water over it, lie about ¾ mile from the eastern shore of Vinal Haven Island and about 3 miles **N.** by **W.** ¾ **W.** from Saddleback Ledge light-house. The ledges are about 350 yards apart in a **N.** and **S.** direction and marked by two buoys (spar, black, Nos. 5 and 7).

Kimball's Rock is a small, bare rock lying nearly ⅝ mile **W.** from **Kimball's Head**, the western point of Kimball's Island; it is about 2 miles to the eastward of the sailing line when bound up the bay, and about ¼ mile when bound into Merchant's Row.

Outer Scrag Ledge is a large ledge which shows bare except at high water, lying on the eastern side of the channel about 1½ miles **SW.** by **S.** from Deer Island Thoroughfare light-house and ⅞ mile **W SW.** ¾ **W.** from Sparrow Island. There is an 18-foot spot nearly ⅜ mile **SW.** from this ledge.

The Brown Cow or **Channel Rock** is a small, bare ledge with shoal water extending about 200 yards to the northward and southward from it; at high water the rock is not easily distinguished. It lies ¾ mile **W.** ½ **S.** from the western end of Scraggy Island and 1¼ miles **W SW.** from Deer Island Thoroughfare light-house.

West Mark Island Ledge is a detached ledge lying a little over ⅝ mile **NW.** by **W.** from Deer Island Thoroughfare light-house; it has 6 feet of water over it and is marked by a buoy (spar, red, No. 2).

Babbidge Island Ledges extend out about 700 yards from the southeastern side of Babbidge Island, the island at the northern side of entrance to Fox Islands Thoroughfare.

Seller's Rock is a small bare rock lying ⅜ mile from the western shore of Stimpson's Point, about 2⅝ miles above Deer Island Thoroughfare light. There is a small ledge with 6 feet of water over it, about 250 yards to the southward of the rock.

Porcupine Ledge, a small spot with 16 feet over it, lies nearly ¾ miles **S.** from Eagle Island light-house; it is marked by a buoy (spar, red and black horizontal stripes).

Denning's Point Ledge is bare at half tide and makes off ¼ mile to the northwestward from the point, about 1½ miles **E.** ½ **S.** from Eagle Island light-house.

View of Monhegan Island, the Lt.Ho bearing SW, distant ¾ Miles.

View of Approaches to Muscle Ridge Channel from the Westward, north of Monhegan Id. Marshall Pt.Lt.Ho bearing N.NE. ¼ E., distant 7 Miles.

Middle Rock is a small rock with 10 feet over it, and deep water all around; it is marked by a buoy (spar, red and black horizontal stripes), and lies nearly ¾ mile **NE.** by **N.** from Eagle Island light-house.

There are no dangers above Middle Rock that cannot be seen so as to be avoided. The islands to the westward of the sailing line should not be approached from the eastward nearer than 350 yards.

3. ***From Cape Rosier to Fort Point.***—Pass ½ mile to the westward of Cape Rosier, steering **N.** by **E.** ½ **E.** and continue up the bay. When Fort Point light bears **NE.** ⅝ **N.** steer for it on that bearing. Pass at least 200 yards to the westward of Fort Pond Ledge beacon and midway between the beacon and light-house, hauling to the eastward so as to give the point a berth of ¼ mile when it bears **W.**; then—

If waiting for a favorable tide and tow-boat to go up the river, anchor on the western side of the channel above Fort Point, about on a line between Fort Point and Sandy Point.

If the tide and wind are favorable, vessels may follow the directions under heading "Penobscot River" as far as Bucksport, above which strangers should take a pilot or tow-boat.

Remarks.—On the **N.** by **E.** ½ **E.** course Dice's Head light and the entrance to Castine Harbor will be made and passed, leaving them on the starboard hand. Islesboro Harbor, Sabbath Day Harbor, and Parker's Cove, will be left on the port hand. The sailing line leads about midway between Dice's Head and **Coomb's Point**, the eastern point of North Islesboro; Cape Gellison will be ahead, Fort Point light on the starboard bow, and **Sears Island**—high, wooded, with a clear space and large white house on its southern slope—will be on the port bow.

On the **NE.** ⅝ **N.** course, with Fort Point light ahead, Fort Point Ledge beacon will be made a little on the starboard bow and the high hills on Whitmore's Island will be seen back of and a little to the left of the light-house.

Dangers.—**Hewes Ledge** is a large ledge, bare at half tide near its northern end and awash at low water near the southern; it lies ¼ mile **N NE.** from **Hewes Point**—the northeastern point of South Islesboro. The northeast end of the ledge is marked by a buoy (spar, black, No. 1), and the southwest end by another buoy (spar, red, No. 2).

Long Island Ledge has 8½ feet over it, and lies ¾ mile from the eastern shore of North Islesboro, off Parker's Cove. It is marked by a buoy (spar, black, No. 9) placed off its eastern end; the ledge bears **S.** ½ **W.** nearly 1 mile from Coomb's Point, and **SW.** ⅞ **W.**, about 2½ miles, from Dice's Head light-house.

A ledge showing bare at low water makes off nearly ½ mile from the eastern shore in the bight, about 2 miles below Fort Point. The end of this ledge bears about **E.** ¼ **S.** from the southern point of Sear's Island and **S.** by **W.** ¼ **W.** from Fort Point light-house.

Fort Point Ledge is a large ledge, bare near its northern end at half tide, lying ⅝ to ¾ mile **S.** of Fort Point light-house. On the highest part of the ledge is a square gray stone beacon, with a mast and keg on top; about ¼ mile **S SE.** ¼ **E.** from the beacon the ledge has 6 feet over it. The beacon should be given a berth of at least ⅝ mile when approaching from the southward and eastward.

MUSCLE RIDGE CHANNEL. †

This passage leads into West Penobscot Bay from the westward and is much used by vessels on account of its being sheltered from all winds and affording an anchorage in case of bad weather. From its entrance at Whitehead it extends in a **NE.** direction about 6 miles to Sheep Island, and the channel passes between numerous rocks and ledges. These dangers are, however, so well marked that in clear weather with a fair wind no difficulty will be experienced in following the sailing directions. On the eastern side of the channel is a large group of islands and ledges which separates it from Penobscot Bay. These islands are of no importance with the exception of **Dix Island**, which has large stone quarries and is distinguished by the large buildings on it. To the southward of these islands **Two Bush Channel** leads into West Penobscot Bay. On the western side, between Whitehead and Sprucehead islands, is **Seal Harbor**, an anchorage much used by coasters; it has 18 to 23 feet of water with soft bottom.

Dix Island Harbor is an anchorage between Andrew's, Birch, and Dix islands; it is reached from the southwestward through a narrow and crooked channel leading between the ledges north of Hewell's Island; it is unsafe for strangers to enter.

Westkeag River empties into the western side of Muscle Ridge Channel in the head of the bight to the westward of Ash Island and about midway between Whitehead and Owl's Head. This river has a narrow and crooked channel unsafe for strangers. The village of **South Thomaston** is at the head of navigation, 2 miles above its mouth; the greatest draught taken to the village is 10 feet, the usual draught about 8 feet; 4 feet can be taken into the entrance at low water. Strangers generally take a pilot, anchoring off the mouth of the river with signal set until boarded by one. South Thomaston is about 3 miles overland from the city of Rockland and the same distance from Thomaston.

Fisherman's Island Passage leads from Muscle Ridge Channel to Penobscot Bay, between Fisherman's Island and Sheep Island. Several dangers lie in this passage, but they are marked by buoys and can be easily avoided in the daytime in clear weather.

† Shown on Coast and Geodetic Survey charts: **312**, scale $\frac{1}{40,000}$, price $0.25; and **104**, scale $\frac{1}{80,000}$, price $0.40.

Owl's Head Bay lies between Sheep and Monroe islands on the east and the mainland on the west, and is a continuation of Muscle Ridge Channel to the northward of Fisherman's Island Passage. The channel through Owl's Head Bay is very narrow on the western side of Sheep's Island where it is marked by red can-buoy No. 2.

Owl's Head Harbor is a small shallow cove in the west shore of Owl's Head Bay, about ½ mile south of Owl's Head light-house. This cove affords anchorage for small vessels that lie aground at low water.

Prominent Objects.—Whitehead Island is marked by **Whitehead light-house** (see table, page 16) on its eastern end, and on its southwestern side by a life-saving station; the latter and several flag-staffs are conspicuous when approaching from the southwestward. Standing up through the channel from the southward the large tripod beacon off the eastern side of Ash Island will show conspicuously on the port bow, and the tripod beacon on Otter Island on the starboard bow. On the eastern side of the channel Dix Island with its numerous houses will be most readily distinguished. **Owl's Head light-house** (see table, page 18) will be plainly seen when abreast of Ash Island, and the large red can-buoy off Sheep Island bar is a conspicuous feature when passing through Owl's Head Bay.

SAILING DIRECTIONS, MUSCLE RIDGE CHANNEL.

These directions can be readily followed in the daytime in clear weather with a fair wind; they carry a least depth of about 5 fathoms. Strangers should not attempt this passage in the night. It has been noticed that the fog-signal at Whitehead is subject to aberration of sound in thick weather.

1. ***Approaching and passing through.—From the Westward.***—Follow the directions for approaching and entering West Penobscot Bay, Section 1 A, page 94, and when Whitehead light is made steer for it on any bearing between **NE.** by **N.** and **NE.** by **E.** ¼ **E.** Pass north of the red bell-buoy and red spar-buoy No. 2, and about 300 yards east of the light-house. When the light bears about **W NW.**, distant 300 yards, steer **NE.** ⅜ **E.**

Following are the aids, in the order and on the side they should be left, with the courses to be steered while passing through Muscle Ridge Channel from Whitehead to Owl's Head.

On the Port hand.	On the Starboard hand.
1. Whitehead light-house distant 300 yards.	
	2. Yellow Ledge spindle (red, iron shaft, cylinder on top), distant 250 yards.
3. Hay Island Ledge buoy (nun, black, No. 1), distant 300 yards.	

Note.—The entrance to Seal Harbor is open on the port hand. Vessels bound into the harbor haul to the westward, passing 150 yards north of Hay Island Ledge buoy, and steer **N NW.** ½ **W.** Anchor when the western end of Sprucehead Island bears **N.**

4. Lower Gangway Ledge buoy (can, red and black horizontal stripes), distant 150 yards. This buoy will be made nearly ahead, and the course should be changed so as to leave it on either hand until it is passed.	
5. Burnt Island Ledge buoy (spar, black, No. 3), distant 600 yards.	
6. White Rock, on **SE.** side of Sprucehead Island (rock painted white with black ball and stripe), distant 600 yards.	
	7. Hurricane Ledge buoy (spar, red, No. 4), distant 200 yards.
8. Sunken Ledge buoy (spar, black, No. 5), distant 350 yards.	
9. Garden Island Ledge spindle (iron, cylinder on spindle), distant about 600 yards.	
	10. Oak Island Ledge buoy (spar, red, No. 6). distant 300 yards.
11. Otter Island Ledge spindle (iron, cage on spindle), distant 300 yards.	11. Otter Island beacon (red wooden tripod with spindle and cask on top), distant 300 yards.

On the Port hand.

12. Ash Island Ledge buoy (spar, black, No. 7), distant 125 yards.

14. Half-tide Rock buoy (spar, black, No. 9), distant 250 yards.

16. Ash Island beacon and bell-buoy, distant about 250 yards.

On the Starboard hand.

13. Upper Gangway Ledge buoy (nun, red and black horizontal stripes), distant 150 yards.

15. Inner Grindstone Ledge buoy (spar, red, No. 8), distant 500 yards.

With Ash Island beacon bearing **W.**, distant about 300 yards, steer **N NE.** $\frac{1}{8}$ **E.**; Sheep Island Bar buoy (can, red, No. 2) will be made on the starboard bow.

Note.—Fisherman's Island Passage will be open to the eastward. An **E NE.** $\frac{1}{2}$ **E.** course from Ash Island beacon, leaving Emery's Ledge and Northwest Ledge buoys (spar, red and black horizontal stripes) 200 yards on the port hand and Grindstone Ledge buoy (spar, red, No. 2) on the starboard hand, will lead through the passage into West Penobscot Bay and up to the bell-buoy at entrance to Fox Islands Thoroughfare.

17. Emery's Ledge buoy (spar, red and black horizontal stripes), distant about 650 yards.
18. Sheep Island Bar buoy (can, red, No. 2), distant 100 yards.

With Sheep Island Bar buoy bearing **E.**, distant 100 yards, steer **NE.** and give the western shore of Monroe Island a berth of 150 to 300 yards.

19. Dodge's Point Ledge spindle (iron, black, cage on top), distant 250 yards.
20. Owl's Head Ledge buoy (can, black, No. 1), distant 250 yards.
21. Owl's Head light-house, distant $\frac{1}{4}$ mile.

If bound to Rockland, follow the directions under that heading.

If bound up West Penobscot Bay, steer **N NE.** $\frac{1}{2}$ **E.** about 7 miles until Negro Island light bears **W.** by **N.**, then follow the directions in Section 2, "Sailing Directions, West Penobscot Bay," page 94.

If bound to East Penobscot Bay or through Eggemoggin Reach, steer **NE.** by **E.** $\frac{1}{2}$ **E.** 6 miles. Pass about $\frac{1}{2}$ mile south of McIntosh Ledge buoy (nun, red and black horizontal stripes), and when a little over 1 mile past this buoy steer **NE.** $\frac{5}{8}$ **N.** When about $\frac{1}{2}$ mile from the shore above Cape Rosier, follow the directions in Section 3, "Sailing Directions, East Penobscot Bay," page 89.

1 A. ***From Owl's Head to Whitehead.***—With Owl's Head light bearing **W NW.**, distant $\frac{1}{4}$ mile, steer **SW.** Sheep Island Bar buoy (can, red, No. 2) will be a little on the port bow and left 100 yards on the port hand. From this buoy steer **S SW.** $\frac{1}{8}$ **W.**; Ash Island beacon will be on the starboard bow and left 300 yards on the starboard hand. When the beacon bears **W.**, steer about **SW.** $\frac{3}{8}$ **W.** Leave two black spar-buoys (Nos. 9 and 7) on the starboard hand and a red and black horizontal striped nun-buoy on the port hand. Pass midway between Otter Island beacon (red tripod) and the spindle to the northwestward. After passing the beacon leave red spar-buoy No. 6 about 300 yards on the port hand and a spindle 600 yards on the starboard hand. The next aid passed is black spar-buoy No. 5, which is left 350 yards on the starboard hand. Red spar-buoy No. 4 should be left 200 yards on the port hand and a red and black horizontal striped can-buoy about 150 yards on the starboard hand. A black nun-buoy (No. 1) should be left 300 yards on the starboard hand and the spindle on Yellow Ledge (red, iron shaft, cylinder on top) about 250 yards on the port hand.

Pass 300 yards to the eastward of Whitehead light and steer about **SW.** by **W.**, leaving red spar-buoy No. 2 and the bell-buoy about 200 yards on the port hand.

WEST PENOBSCOT BAY.†

This is the part of Penobscot Bay lying west of Vinal Haven, North Haven, and North and South Islesboro islands. Heron Neck light marks the eastern point at the entrance from seaward and Whitehead light the western. Matinicus Rock and Monhegan Island lights are the off-shore guides to the entrance (see table of lights, page 16). From the eastward the approach is between Seal Island on the south and Saddleback Ledge light (see table of lights, page 16) and Vinal Haven Island on the north; this passage is about 7 miles wide and has few dangers. From the westward the bay is entered either through Muscle Ridge Channel (see heading) or through Two Bush Channel, to the southward of the group of islands lying about **E SE.** from Whitehead.

The best harbor of refuge and the one most readily entered by strangers is Rockland Harbor. Rockport Harbor affords shelter from all but southerly winds. Gilkey's Harbor, though small, affords shelter against winds from any direction. **Seal Harbor**, in the southern entrance of Muscle Ridge Channel, is well sheltered and much used by vessels passing in and out of the bay through Muscle Ridge Channel.

Rockland Harbor is on the west shore of the bay (see heading).

Carver's Harbor is in the south side of Vinal Haven Island (see heading).

The Sound, The Reach, Leadbetter's Narrows, The Basin, Lairy Narrows, and **Old Harbor** are formed by the islands off the southwestern side of Vinal Haven Island, and are described under the heading "The Sound."

Crockett's Cove is just to the eastward of **Crockett's Point**—the southeastern point at entrance to Fox Islands Thoroughfare; the cove is about 1 mile long and is 200 yards wide at the entrance, which is obstructed by ledges; strangers should not attempt to enter, as better anchorage will be found in Fox Islands Thoroughfare.

Fox Islands Thoroughfare makes to the eastward between Vinal Haven and North Haven islands (see heading).

Wooster Cove is a small cove on the west side of North Haven Island, to the northward of Fox Islands Thoroughfare entrance; it only affords a lee in easterly winds.

Bartlett's Harbor is a small cove with deep water and good anchorage, sheltered from all but westerly and northerly winds. It is about 2 miles above Stand in Point on the western shore of North Haven Island. There is a rock with 9 feet over it exactly in the middle of the entrance; it can be passed close-to as it is small with deep water all around it.

North Harbor is about 2¼ miles to the northeastward of Bartlett's Harbor; it has a narrow entrance but has good water and affords shelter against all winds. A rock with 10 feet of water over it lies in the middle of the channel nearly ½ mile inside the entrance.

Clam Cove is a shallow cove making into the west shore of the bay, about 1½ miles north of Rockland Harbor entrance; it is not a good anchorage.

Rockport Harbor, about 3½ miles north of Rockland Harbor, on the west shore of the bay, affords excellent anchorage in 30 to 50 feet of water, sheltered from all but a **S SE.** wind (see heading).

Camden Harbor, on the west shore of the bay, about 2½ miles north of Rockport Harbor entrance, is a good anchorage with 12 to 30 feet of water, sheltered from all winds (see heading).

Duck Trap Harbor is a broad bight in the west shore of the bay, about 5 miles north of Camden Harbor and about 9 miles to the southward of Belfast Harbor. The town of **Lincolnville** is on the shore of the harbor. For sailing directions, see "Sailing Directions, West Penobscot Bay," Section 2, par. III.

Gilkey's Harbor is on the western side of South Ilesboro (**Long Island**); it is small and of no commercial importance, but is sometimes used as an anchorage for the night. There are two entrances; the one from the southward leading between the Ensign Islands and Job's Island is difficult to navigate at night; strangers seldom attempt it without a pilot. The northern, marked by **Grindel's Point Light** (see table of lights, page 18), is easy of access, although quite narrow. The usual anchorage for vessels entering by this entrance is just inside and to the southward of the light. The harbor is frequently closed by ice during the winter. For directions to enter, see "Sailing Directions, West Penobscot Bay," Section 2, par. IV.

Seal Harbor, at the southwestern end of North Ilesboro and about 3 miles north of Grindel's Point light-house, is an excellent anchorage in 20 to 50 feet of water, soft bottom, sheltered from all but **SW.** winds. This harbor is used by vessels bound up or down the bay as an anchorage for the night, and is easy of access; vessels coming from the southward usually pass south of Flat Island; coming from the northward they usually pass in between Seal Island and Flat Island. The Ilesboro mail is brought here from Northport in a sail-boat. For directions entering, see "Sailing Directions, West Penobscot Bay," Section 2, par. V.

Saturday Cove is a small shallow cove in the west shore of the bay, about 3 miles north of Duck Trap Harbor and opposite Seal Harbor. Near the cove is the village of **Northport** and a steamboat landing.

Turtle Head Cove is a broad bight in the north end of North Islesboro; it is sheltered from southerly and easterly winds, and has good anchorage in 18 to 40 feet water, soft bottom. **Turtle Head** is the long narrow point on the

† Shown on Coast and Geodetic Survey charts: **310, 311,** scale of each $\frac{1}{40,000}$, price of each $0.25; and **104,** scale $\frac{1}{80,000}$, price $0.40. The entrance from the westward is shown on chart **312,** scale $\frac{1}{40,000}$, price $0.25.

eastern side of the cove, with a hill covered with trees near its northern end. **Marshall's Point**, on the western side of the cove, is about 25 feet high and bare of trees. The best anchorage is nearest Turtle Head. For directions entering, see "Sailing Directions, West Penobscot Bay," Section 2, par. VI.

Belfast Bay, Harbor, and **River** are in the northwestern part of West Penobscot Bay; the entrance of the river is usually known as Belfast Harbor, and the city of **Belfast** is on its southern side (see heading Belfast Harbor).

Searsport Harbor is about 3½ miles east of Belfast. It is a broad bight open to the southward, but it affords good anchorage in 18 to 30 feet of water, soft bottom, sheltered from northerly winds, and is used by all classes of vessels. The town of **Searsport** is at the head of the harbor; the heaviest draught of vessels loading here is 12 feet, the average draught about 9 feet; there is a depth of 10 feet at the steamboat wharf at low water. Fresh water can be obtained alongside the wharves; provisions and ship-chandler's stores in the town. The steamers of the Boston and Bangor line touch here in summer. For directions to an anchorage in Searsport Harbor, see Section 2, par. VII, "Sailing Directions, West Penobscot Bay."

Long Cove is to the eastward of Searsport Harbor, between the northwestern shore of Sears Island and the mainland; it has a good anchorage in 6 to 24 feet of water, soft bottom, and is sheltered from all but southwesterly winds.

Stockton Harbor is between Cape Gellison and Sears Island on the western side of entrance to Penobscot River. It is a good harbor, but little used, as it is difficult to enter with a head wind. The village of **Stockton** is at its head.

SAILING DIRECTIONS, WEST PENOBSCOT BAY.

These directions are good for vessels of the heaviest draught, and can be easily followed in clear weather.

1. ***Approaching and Entering.—From the Eastward.***—Pass about ½ mile **N.** of Mt. Desert Rock, steer **W NW.** ⅝ **W.** about 21½ miles, and pass about 1¾ miles **S.** of Isle au Haut.

Or, with Long Island Head bearing **N.**, distant 1 mile, steer **W.** ⅞ **S.** about 14¼ miles and pass about 1½ miles **S.** of Isle au Haut.

When the spindle on Roaring Bull Ledge bears **N.**, distant about ¾ mile, steer **W NW.** ¼ **W.** about 11¾ miles. Heron Neck light will then bear **NE.** ½ **E.**, distant a little over 2 miles. From this position steer **NW.** by **N.** for Owl's Head light, until Fisherman's Island bears **W SW.** ¾ **W.**, and at night the red rays of Brown's Head light will be changed to white; then if bound up West Penobscot Bay follow the directions in Section 2.

If bound to Castine follow the directions in Section 2 A.

Remarks.—Approaching the entrance to Penobscot Bay from the eastward **Isle au Haut**, a large, high, and well wooded island, will show conspicuously, and is left about 1¾ miles on the starboard hand. Standing across the entrance to East Penobscot Bay, on the **W NW.** ¼ **W.** course, Saddleback Ledge light will be left 1¾ miles on the starboard hand, and the southernmost islands and ledges lying south of Vinal Haven Island about 1 mile. **Heron Neck light** (see table, page 16) will show conspicuously on the southwestern point of Green Island. **Hurricane Island**—high, bare, rocky island, **NW.** from Heron Neck light-house—is the most conspicuous island to the westward of Vinal Haven Island. **Little Hurricane Island** is the small island just to the westward of Hurricane Island. The Camden Hills will be seen to the northward on the west shore of the bay.

Standing on the **NW.** by **N.** course Hurricane and Little Hurricane islands and the White Islands will be left 1½ miles on the starboard hand. **Munroe Island**—high and thickly wooded—will be ahead, and **Sheep Island**—comparatively low and sparsely wooded—a little on the port bow; Owl's Head light will be made a little open to the northward of Munroe Island. Two small, low, grassy islands will be seen about 1¼ miles to the southward of Sheep Island; the northernmost and largest is **Fisherman's Island.** The passage between Fisherman's and Sheep islands is **Fisherman's Island Passage**, one of the channels leading into Muscle Ridge Channel. On a clear day or at night Brown's Head light, at the entrance to Fox Islands Thoroughfare, will be made off the starboard beam when abreast of Fisherman's Island.

Dangers.—**Cold Ledge, Eastern Ear Ledge,** and **Roaring Bull Ledge** are described on page 23.

The numerous rocks and ledges lying south of Vinal Haven Island can be avoided by passing 1 mile to the southward of the islands and ledges that are bare at high water.

Bay Ledge is described on page 24; the sailing line passes nearly 1½ miles to the northward of it.

Perry's Ledge has 4 fathoms of water over it, and lies nearly 3¼ miles **W.** ¼ **S.** from Heron Neck light-house. This ledge is not dangerous except to the heaviest draught vessels and during heavy weather when the sea breaks over it at low water.

A spot with a least depth of 10 feet of water over it lies 1⅛ miles **W.** from Little Hurricane Island. The sailing line leads about midway between this shoal and Perry's Ledge.

Junken Ledge is described under Section 1 A.

Between Little Hurricane Island and the entrance to Fox Islands Thoroughfare there are many outlying unmarked dangers. To avoid these vessels should keep well over on the western side of the bay, where by keeping a little over ¼ mile to the eastward of the outlying islands no dangers will be enconntered.

1 A. *Approaching and Entering.—From the Westward.*—If desiring to pass through Muscle Ridge Channel from the whistling-buoy **N.** of Monhegan Island, steer **NE.** $\frac{5}{8}$ **E.** about 14½ miles and follow the directions in Section 1, "Sailing Directions, Muscle Ridge Channel," page 90.

If desiring to pass through Two Bush Channel from the whistling-buoy **N.** of Monhegan Island, steer **NE.** by **E.** ¼ **E.** about 12½ miles, or until Tennant's Harbor light bears **NW.** ¼ **N.**; then steer **E.** ½ **N.** and pass ¾ mile **S.** of Two Bush Island. When Whitehead light bears **NW.** ¾ **W.**, or is in range with the southernmost Two Bush Island, steer **NE.** ¾ **N.**, taking care not to be set to the westward, and pass at least ¾ mile to the eastward of the northeastern end of Andrew's Island. When Owl's Head light bears **NW.** by **N.**, and at night, the red rays of Brown's Head light change to white, follow the directions in Section 2, or 2 A, according to destination.

Remarks.—The **NE.** $\frac{5}{8}$ **E.** course leads for Whitehead light and well clear of all dangers until up to the entrance to Muscle Ridge Channel. Burnt Island and the islands off the entrance to Herring Gut will be left well on the port hand. Tennant's Harbor light will be made on the port bow; Roaring Bull, Hooper's Shoal, and Metinic Island Ledge will be left 1½ miles on the starboard hand in the order named. The bell-buoy off the entrance to Muscle Ridge Channel should be made on the starboard bow.

On the **NE.** by **E.** ¼ **E.** course Roaring Bull buoy should be left ⅝ mile and Metinic Island Ledge buoy ⅝ mile on the starboard hand. The Two Bush Island will be made a little on the starboard bow. On the **E.** ½ **N.** course Crow Island Ledges and Two Bush Island will be left ¾ mile on the port hand; the course should be continued until Two Bush Island and Whitehead light are in range. The southern end of Vinal Haven Island will be ahead. Standing into the bay on the **NE.** ¾ **N.** course pass at least ¾ mile to the eastward of **Andrew's Island**, the large island about 2¼ miles **NE.** ½ **N.** from Two Bush Island; this will clear the ledges and rocks which lie to the eastward of a line between the islands. After passing Andrew's Island, several small, grassy islets will be seen to the westward and Sheep and Munroe islands to the northwestward.

Dangers.—**Roaring Bull** (Black Ledge) is awash at low water and generally marked by breakers; it lies 2¾ miles **W. NW.** ¾ **W.** from Metinic Green Island and 7¾ miles **NE.** by **E.** from Monhegan light-house. A buoy (nun, black, No. 1) is placed about 100 yards **NW** from the shoalest part of the ledge.

Hooper's Shoal has a least depth of 17 feet over it and lies 2¼ miles **W.** from the northern end of Metinic Island and 1⅞ miles **NE.** from Roaring Bull.

Metinic Island Ledge is nearly ¼ mile long in an **E NE.** and **W SW.** direction, and has a least depth of 8 feet over it. The ledge lies 1⅞ miles **W.** by **N.** from the northern end of Metinic Island, and is marked off its southwestern end by a buoy (spar, red and black horizontal stripes). This buoy is left on the starboard hand when standing in for the entrance to Penobscot Bay or Muscle Ridge Channel.

Crow Island Ledges extend 1½ miles in a **W.** by **S.** direction from Two Bush Island; they consist of several detached rocks with 8 to 15 feet of water over them, and are marked off their western end by a buoy (spar, red, No. 2). This buoy is numbered for the Two Bush Channel, coming from the eastward.

Alden's Rock, a small detached rock with 4 feet of water over it, lies about 2¾ miles **E NE.** ½ **E.** from the northern end of Metinic Island, and 2⅝ miles **S.** ¾ **W.** from Two Bush Island; it is marked by a buoy (spar, red and black horizontal stripes) placed to the southward of the rock.

Northern Triangles is a group of detached ledges 1⅛ miles long in an **E SE.** and **W NW.** direction, about 1⅛ miles to the northward of Little Green Island. Some of these ledges show bare at low water, and the sea breaks on all of them at half tide. Their western end lies ⅞ mile **E.** ¾ **N.** from Alden's Rock, and Northern Triangles buoy (nun, black, No. 1), which is north of the eastern end of the ledges, bears about **N NE.** ½ **E.**, distant 1⅝ miles from the western end of Little Green Island.

Two Bush Reef extends over ¾ mile to the northeastward from Two Bush Island; it consists of a series of sunken and bare rocks. There is deep water close up to the reef.

Halibut Rock is a small rock, bare at half tide, lying **NE.** ½ **E.**, a little over 1½ miles from Two Bush Island. About 600 yards **E NE.** from this rock is **False Halibut Ledge**, a small ledge with a least depth of 9 feet over it.

Junken Ledge has 4½ fathoms over it, and lies 3¾ miles **E.** by **N.** from Two Bush Island and 2⅝ miles **SE.** by **E.** from the northeastern point of Andrew's Island. The sea breaks over it in heavy weather.

Northeastern Pond Ledge, bare at half tide, lies ⅝ mile **NE.** ¾ **E.** from the northeastern point of Andrew's Island, and ½ mile **S.** by **W.** ¾ **W.** from Crescent Island. About 450 yards **S.** from this ledge is **Sunken Pond Ledge** with a least depth of 6 feet over it.

2. *From abreast Fisherman's Island to Fort Point.*—I. When Fisherman's Island bears **W. SW.** ¾ **W.**, distant 2 miles, steer **N.** by **E.** ¼ **E.** about 9 miles, passing ⅞ mile to the westward of Mark Island. When Negro Island light, at the entrance to Camden Harbor, bears **W.** by **N.**, steer **NE.** ⅞ **N.** about 12 miles, and when Turtle Head bears **E.**, steer **NE.** by **E.** ¼ **E.** Pass midway between Fort Point light and Fort Point Ledge beacon, and round the point, giving it a berth of ¼ mile. When the light bears **W.**, follow the directions in Section 3, "Sailing Directions, East Penobscot Bay," page 89.

II. *If bound to Rockland, Rockport, Camden, or Belfast,* see the different headings.

III. *If desiring to anchor in Duck Trap Harbor*, when on the **N.** by **E.** ¼ **E.** course, continue on it past Negro Island light until about ⅜ mile from the western shore; then haul a little to the eastward and follow the shore, keeping at this distance. Leave Haddock Ledge buoy (nun, red, No. 2) on the starboard hand, and anchor ⅜ mile to the northward of the buoy.

IV. *If desiring to anchor in Gilkey's Harbor*, when on the **NE.** ⅞ **N.** course up the bay, and Grindle's Point light bears **E.**, or to the southward of **E.**, steer for it. Stand in past the light, giving it a berth of from 200 to 400 yards on the port hand, and anchor to the southward of it in 5 to 6 fathoms water.

V. *If desiring to anchor in Seal Harbor*, when on the **NE.** ⅞ **N.** course up the bay, and Spruce Head—the eastern point at the entrance to Duck Trap Harbor—bears abeam, steer **NE.** by **E.** ½ **E.** Pass midway between Flat Island and the eastern shore, and stand into the harbor. Anchor in 5 to 9 fathoms water in the middle or eastern side of the harbor; the northern and western sides are shoal.

VI. *If desiring to anchor in Turtle Head Cove.*—On the **NE.** ⅞ **N.** course, when the northern end of Turtle Head bears to the eastward of **E.** ½ **N.**, steer for it, and when it is from ¼ to ½ mile distant steer **S.** Anchor in 4 to 6 fathoms water inside the points of the cove, and give the eastern shore a berth of at least 250 yards. The head of the cove is shallow and should not be approached closer than ¼ mile. On the western side of the anchorage is a large shoal making about ⅜ mile to the northward from Marshall's Point; it is about ⅜ mile wide **E.** and **W.**, and has spots with 3½ to 9 feet over them.

VII. *If desiring to anchor in Searsport Harbor.*—When on the **NE.** ⅞ **N.** course, and *Flat Island*—the small island about 2¼ miles above Gilkey's Harbor entrance—is on the starboard beam, distant a little over ⅜ mile, steer **N NE. Easterly.** Stand in and anchor in 3½ to 4½ fathoms, giving the northern shore a berth of a little more than ¼ mile.

Remarks.—On the **N.** by **E.** ¼ **E.** course, standing up the bay, Owl's Head light will be left on the port hand, distant 2 miles. **Mark Island**—small, high, rounded island, thickly wooded—will be made on the starboard bow; ¾ mile south of it is **Robinson's Rock.** The towns of Rockport and Camden will be opened on the port bow.

On the **NE.** ⅞ **N.** course **Seven Hundred Acre Island**, the large island south of Gilkey's Harbor, should be left ½ mile on the starboard hand. Duck Trap Harbor will be on the port bow and **Great Spruce Head**, appearing as a high, rounded, dark headland, sloping toward the water, will be a little on the port bow. The islands to the eastward of the sailing line will be given a berth of ½ mile, and as the northern end of Long Island (North Islesboro) is approached, the town of Belfast will be opened to the northwestward at the head of Belfast Bay.

On the **NE.** by **E.** ¼ **E.** course the southern end of Sears Island will be left ⅝ mile on the port hand, and Fort Point will be made a little on the port bow; as it is approached, the beacon on Fort Point Ledge will be made a little on the starboard bow.

Dangers.—**Robinson's Rock** is bare, and surrounded by ledges; it lies ¾ mile **S.** from Mark Island and 3½ miles **E SE.** ¼ **E.** from Indian Island light-house. This rock and McIntosh Ledge are the southernmost of a chain of rocks, ledges, and islands which extend 5 miles in a northeasterly direction to the southern end of **Long Island** (**South Islesboro**). Passing to the westward of Robinson's Rock it should be given a berth of at least ¼ mile.

Porterfield Ledge and **Lowell Rock** are described under heading Rockport Harbor. The ledges at the entrance to Camden Harbor are described under that heading.

E. Goose Rock is a bare, rocky islet surrounded by ledges, and lies ½ mile **N NE.** from Mark Island. On its western side it can be approached as close as 175 yards, but there are rocks and ledges between it and **Lasell's Island**, the island to the eastward.

The Graves is a ledge about 300 yards long and 100 yards wide, showing bare, rocky heads at high water and a large part bare at low water. It lies about ⅞ mile from the western shore of the bay, midway between Indian Island and Negro Island lights. The channel to the westward of The Graves, between it and **W. Goose Rock**, the small island to the westward, is nearly ⅝ mile wide, and has depths of 11 to 16 fathoms.

Moxy's Reef has 3½ fathoms over it, and lies nearly ⅝ mile from the western shore and 1¼ miles **NE.** by **E.** from Negro Island light-house.

Dillingham's Ledge is about 350 yards in diameter and has a least depth of 9 feet over it. It lies ½ mile from the western shore, and bears **NE.** ½ **N.**, distant 1 ¾ miles from Negro Island light-house; it is marked by a buoy (spar, black, No. 1) off its southeastern side.

A small detached spot with 8 feet of water over it lies about ⅝ mile **N NW.** from the southern end of Ensign Islands. This spot is avoided by keeping Great Spruce Head open to the westward of the western shore of Seven Hundred Acre Island.

Haddock Ledge, about 150 yards in diameter, has a least depth of 4 feet over it, and lies in the middle of the bight, forming Duck Trap Harbor; it bears **W NW.**, distant 2 miles from Grindel's Point light-house, and is marked by a buoy (nun, red, No. 2) on its southwestern side.

Flat Island is a small bare island on the eastern side of the bay off the entrance to Seal Harbor; it has shoals making out 600 yards to the northward and about 300 yards to the southward and eastward. The western side of the island should be given a berth of at least 200 yards.

Seal Island and **Hog Island** lie **NE.** by **N.** from Flat Island, and are connected by shoal water, which also extends to the northward from Hog Island nearly $\frac{3}{8}$ mile. There is a channel about 300 yards wide between the southern end of Seal Island and Flat Island.

Sprague Ledge, with 2 feet of water over it, and **Barley Ledge**, bare at low water, extend in a **NE.** by **N.** direction $\frac{7}{8}$ mile above Hog Island. They are avoided by giving the eastern shore a berth of $\frac{5}{8}$ mile until 1 mile above Hog Island.

A dangerous shoal makes out $\frac{3}{8}$ mile **N NE.** from Marshall's Point, the northwestern point of North Islesboro, on the western side of Turtle Head Cove.

A shoal makes out nearly $\frac{1}{4}$ mile **N.** from Turtle Head; it has 13 feet over it at its northern end.

Brigadier Island Ledge has $12\frac{1}{2}$ feet of water near its end, and extends $\frac{1}{2}$ mile to the westward from the southern point of Sears Island; a part of this ledge is bare 2 hours before low water. A buoy (spar, black, No. 1) marks the southwestern point of the ledge.

Sears Island Ledge makes out $\frac{1}{4}$ mile from the southeastern side of Sears Island, and is partly bare at low water. Its southeastern edge is marked by a buoy (spar, black, No. 3).

A ledge about $\frac{1}{2}$ mile long extends to the southward from **Squaw Point**, the eastern point at entrance to Stockton Harbor. This ledge is bare at low water for nearly its whole length, and has a small part near the middle bare at all times.

Fort Point Ledge is fully described under Section 3, "Sailing Directions, East Penobscot Bay."

2 A. *From abreast Fisherman's Island to Cape Rosier.*—When Fisherman's Island bears **W SW.** $\frac{3}{4}$ **W.**, distant 2 miles, steer **NE.** $\frac{5}{8}$ **N.**; this course made good 16 miles leads into the middle of East Penobscot Bay, abreast the main approach to Eggemoggin Reach. Continued about 2 miles farther it leads $\frac{1}{2}$ mile to the westward of Cape Rosier; then—

If bound up the Penobscot River, steer **N.** by **E.** $\frac{1}{2}$ **E.** and follow the directions in Section 3, page 89.

If bound to Castine, follow the directions under that heading.

Remarks.—On the **NE.** $\frac{5}{8}$ **N.** course, Drunkard's Ledge spindle and **Stand in Point**—the western point of North Haven Island—will be left $\frac{5}{8}$ mile to $\frac{3}{4}$ mile on the starboard hand. McIntosh Ledge will be left about $\frac{7}{8}$ mile on the port hand, and Goose and Mouse islands will be left about 1 mile on the port hand.

The islands lying to the eastward of the sailing line will all be left from $\frac{1}{2}$ to $1\frac{1}{2}$ miles on the starboard hand. These islands are bold-to on their western sides, and can be approached as close as 200 yards from this direction. **Mark Island**, the northwesternmost of them, lying $3\frac{3}{8}$ miles **SW.** $\frac{1}{2}$ **S.** from Cape Rosier, will be made on the starboard bow and left half mile on the starboard hand. The eastern shore of South Islesboro can be approached as close as 400 yards.

Dangers.—**Inner Bay Ledges** are a cluster of rocks and ledges, some of them bare at low water, which lie about 2 miles **S SW.** $\frac{1}{2}$ **W.** from Stand in Point, the western point of North Haven Island. They extend $\frac{3}{4}$ mile in a **N.** by **E.** $\frac{1}{2}$ **E.** direction, and are marked by two buoys; Southern End buoy (can, red, No. 4) and Northern End buoy (spar, red, No. 6). These buoys are left on the starboard hand by vessels bound up the bay.

Drunkard's Ledge is bare at half tide, and marked by a spindle (iron, red, cage on top); it lies $\frac{5}{8}$ mile **SW.** by **W.** $\frac{1}{2}$ **W.** from Stand in Point, and nearly $\frac{5}{8}$ mile **W NW.** $\frac{1}{4}$ **W.** from Fiddler's Ledge beacon. The spindle should be given a berth of at least 250 yards.

McIntosh Ledge has 2 feet of water over it and is about 100 yards in diameter; it lies about $\frac{3}{4}$ mile **SE.** by **E.** from Robinson's Rock, and is marked by a buoy (nun, red and black horizontal stripes) placed southwest from it. There is good water all around the ledge.

Robinson's Rock is a large, bare rock, with several smaller detached rocks, all showing bare, lying $\frac{3}{4}$ mile **S.** from Mark Island. Ledges make out over $\frac{1}{4}$ mile to the northeastward and southward from it.

Goose Island is a bare, rocky islet to the westward of the sailing line, about $1\frac{7}{8}$ miles **NE.** $\frac{3}{4}$ **E.** from Robinson's Rock. The eastern side of this islet should be given a berth of at least $\frac{3}{8}$ mile on account of some rocks which show partly bare at low water.

Mouse Island is a small, rocky islet $\frac{7}{8}$ mile **NE.** $\frac{1}{2}$ **N.** from Goose Island. Between these islands lie several ledges showing bare at low water.

Egg Rock is a small, high, dark rock on the eastern side of the sailing line, about $4\frac{1}{2}$ miles **E.** from the southern end of Mark Island. **Egg Rock Ledge**, with 5 feet of water, lies about $\frac{3}{8}$ mile **S SW.** $\frac{3}{4}$ **W.** from Egg Rock, and is marked by a buoy (spar, red and black horizontal stripes) placed off its northeastern side.

Compass Island Ledge, with 8 feet of water, is small, and lies $1\frac{5}{8}$ miles **E.** $\frac{3}{4}$ **N.** from Egg Rock; it is marked by a buoy (spar, red and black horizontal stripes) placed just to the eastward of the shoalest part of the ledge.

PENOBSCOT RIVER.†

This river empties into the head of Penobscot Bay, and is navigable, at high water, for vessels of 20 feet draught to Bangor, at the head of navigation and tide water, about 24 miles above its mouth. From Fort Point, at its entrance, to Sandy Point, it is about 1 mile wide; above this it narrows rapidly, and at the north end of Whitmore's

† Shown on Coast and Geodetic Survey chart: **311**, scale $\frac{1}{40,000}$, price, $0.25.

Island its width is about ¼ mile. Above this it is somewhat wider in places, but from Hampden to Bangor some parts of it are not more than 225 yards wide.

Penobscot River has a large shipping trade from Bangor and the towns along its shores. About 2½ miles above Fort Point the river is divided by Whitmore's Island into two channels, the principal or main one leading on the west side of the island, and the **Eastern Channel** on the east side; they unite north of Whitmore's Island, near the town of Bucksport. Flowing into Eastern Channel from a northeasterly direction is a shallow stream navigable for small coasting vessels and fishermen at high water, to the village of **Orland**, about 2¼ miles above its mouth.

Bucksport, a town 6½ miles above Fort Point, on the east bank of the river, is the terminus of a branch of the Maine Central Railroad, and the Boston and Bangor line of steamers touch here. There is 18 feet of water at low tide along side the principal wharves. Bucksport is connected with Witmore's Island by a draw-bridge, which crosses Eastern Channel to the eastward of the principal wharves; width of draw 40 feet in the clear. Good anchorage is found off the western end of the town in 5 to 10 fathoms of water.

Marsh River is a shallow, unimportant stream flowing into Penobscot River from a southwesterly direction, about 3 miles above Bucksport; at its mouth it is called **Marsh Bay**. **Frankfort** is a small village of little commercial importance on the west shore of Marsh River.

Winterport is a town on the west bank of the river, 12 miles above Fort Point; it is at the head of winter navigation, as ice closes the river 10 to 12 miles below Bangor. The least water in the channel up to Winterport is 13 feet; there is 20 feet at low water alongside the wharves.

Hampden, a small town on the west bank of the river, is 19 miles above Fort Point. The greatest draught that can be taken up to Hampden is 22 feet; there is 9 to 10 feet of water alongside the wharves at low tide. The village of **Orrington** is on the east bank opposite Hampden.

The city of **Bangor** is about 22 miles above Fort Point, on the west bank of the river, and is connected with the town of **Brewer** on the east bank by a toll-bridge. It has a large coastwise and foreign trade. The greatest draught of vessels going to Bangor is 22 feet at extreme high tides; 20 feet can be carried up on ordinary high water; the usual draught is 12 feet; 10 feet can be taken up at low water; there is 11 feet at low water alongside the wharves, with the exception of High Head wharf, which has 22 feet.

Prominent Objects.—**Dice's Head** is on the northern side of the entrance to Castine Harbor and Bagaduce River; it is easily recognized by **Dice's Head light** (see table of lights, p. 18) and a large skeleton observatory a short distance to the northward of it. **Turtle Head** is the northernmost Point of North Islesboro and is about 2¾ miles **W NW.** from Dice's Head. **Sears Island** lies about 2⅛ miles **N.** by **E.** from Turtle Head and is recognized by a large, white house on the side of a hill in a clearing on the south side of the island. Searsport Harbor and town are to the northwestward of Sears Island. **Fort Point**, the easternmost point of Cape Gellison, is easily distinguished by **Fort Point light** (see table of lights, p. 18) and a large hotel. **Fort Point Ledge beacon** (square, stone, with mast and keg on top), about ⅜ mile **S.** of Fort Point light-house, will show conspicuously when approaching. **Whitmore's Island**, 4 miles long in a **N.** and **S.** direction, with a hill 334 feet high near its northern end, is 2½ miles above Fort Point on the eastern side of the main channel of the river. **Fort Knox**, a large, unfinished granite structure on the west bank of the river opposite the northern end of Whitmore's Island, is a very conspicuous landmark when approaching Bucksport.

The channel of the river is narrow and crooked, requiring local knowledge for its navigation above Bucksport. The depth in places is gradually decreasing, owing to the large amount of refuse from the sawmills on the river above Bangor, which is carried down and deposited on the flats. In 1890 a bar, with a depth of 13 feet over it, had formed across the channel about ½ mile above Bucksport. This may occasion the delay of one tide to vessels of over 18 feet draught bound to Bangor. Coasting vessels acquainted with the river sail up to Bangor or intermediate places with a fair wind; large vessels tow up on the flood. During the summer months the prevailing winds are from the **SW.** Several buoys are placed in the river to mark the edges of shoals. Under the supervision of the General Government the channel of the river abreast of Bangor and above Crosby's Narrows is being improved by dredging. The **Eastern Channel** is shallow and chiefly used by small coasters and fishermen when bound to Bucksport or Orland. There are no buoys or other aids to navigation in this channel.

The usual anchorage for vessels waiting at the entrance of the river for a tow-boat or favorable wind and tide is to the northward of Fort Point or off Sandy Point on the west side of the channel. Vessels bound up the river anchor anywhere in the channel where soft bottom is found. Vessels towing to Bangor, if the tide does not serve, anchor in **Crosby's Narrows**, about 5 miles below, and wait for a favorable tide.

Pilots for Penobscot Bay and River can be had by making signal off Monhegan or Matinicus islands, or they may be taken from fishermen or coasters off the entrance, or in the bay. There are no regular pilots for the river. Strangers wishing to go above Bucksport should take a pilot or tow-boat.

Tow-boats are always taken by large vessels bound up the river; they will generally be found near Fort Point, on the last of the ebb, ready to tow vessels up on the flood. They can be telegraphed for to Bangor from Fort Point or any part of Penobscot Bay having telegraphic communication. Vessels towing up the river do not require a pilot.

Harbor Regulations for the port of Bangor are given in Appendix II.

Supplies.—Coal, anthracite and bituminous, can be had alongside the wharves at Bangor, and anthracite coal in limited quantities at Bucksport, Winterport, and Hampden. There is a coaling dock, with 12 feet of water at its end at low water, on the west side of the river, about 3 miles above Fort Point and just above Odom's Ledge beacon. Water is taken from the river at Bangor; below the city it is taken from wells in casks. Provisions and ship chandler's stores can be obtained at any of the above-mentioned places.

Repairs to vessels' hulls can be made at Bucksport and Bangor. There is a marine railway at Bucksport, capacity 500 tons, and one at Bangor, capacity 1,000 tons. Much of the repairing is done on the beaches at low water. Bangor is the only place on the river at which repairs to the machinery of steamers can be made.

Steamers of the Boston and Bangor line run to Bucksport, Hampden, and Bangor daily in summer; when the river is closed by ice they run to Bucksport or Winterport. The New York and Bangor line of steamers run to Bangor weekly in summer and to Bucksport in winter. A line of steamers run from Bangor to Bar Harbor in summer, and small steamers ply between Bangor and the landings on the river and in Penobscot Bay.

Freshets occur in the river during March and April; they are at times dangerous to vessels.

Marine Hospital.—Relief is furnished at Bangor by an acting assistant surgeon of the Marine Hospital Service; see also Appendix IV.

Ice obstructs navigation each year above Winterport for nearly 5 months, beginning about December; during extreme cold weather the river is obstructed its entire length.

Tides.—High water occurs at Bucksport 16 minutes later, at Winterport 36 minutes later, at Hampden 56 minutes later, and at Bangor 1 hour 14 minutes later than at Fort Point. See also the table on page 15.

SAILING DIRECTIONS, PENOBSCOT RIVER TO BUCKSPORT.

When Fort Point light is made, steer for it on any bearing between **N NE.** ½ **E.** and **NE. by E.** ½ **E.** Give Fort Point Ledge beacon (gray stone, with mast and keg on top) a berth of 300 yards on the starboard hand, and pass about midway between it and the light, then steer **E NE.** When Fort Point Reef buoy (spar, black, No. 5) bears about **W. by N.**, distant about 400 yards, steer **N NE.** and leave Sandy Point Ledge buoy (spar, black, No. 7) about 350 yards on the port hand. When Odom's Ledge beacon (stone, black, with mast, crosspieces, and keg on top, white letters O. L. on each side) bears **N.** ½ **E.**, distant about ¾ mile, shape the course so as to give it a berth of about 200 yards on either hand. Above Odom's Ledge follow a mid-river course, and anchor to the westward of Bucksport on the northern side of the entrance to Eastern Channel in 5 to 10 fathoms of water, soft bottom.

Remarks.—There are no dangers entering Penobscot River until up to Fort Point Ledge. The shores on either side may be approached with safety to ¼ mile. Eastern Channel, leading to the eastward of Whitmore's Island, is narrow and obstructed with unmarked shoals; no sailing directions of value could be given for it. From about ¼ mile above Odom's Ledge beacon to Bucksport, the channel is free of dangers, and the shores are bold-to and may be approached to about 150 yards.

Dangers.—**Sears Island Ledge** is a rocky reef, a part showing bare at half tide, making out ¼ mile in a southeasterly direction from the southern end of Sears Island; it is marked on its end by a buoy (black, spar, No. 3).

A ledge, uncovered at half tide, makes off ⅜ mile to the southward from the southwestern point of Cape Gellison, on the eastern side of the entrance to Stockton Harbor. On the middle of this ledge is a small bare island.

Fort Point Ledge is about ⅜ mile long in a **N NW.** and **S SE.** direction off the mouth of the river below Fort Point. It is marked on its northern end by a gray stone beacon lying ⅜ mile **S.** ¼ **W.** from Fort Point light-house. There is good water on either side of this ledge, but the channel to the westward is generally used, as it is better marked by the beacon which is close to deep water.

Fort Point Reef is a rocky ledge making out about 200 yards to the eastward from Fort Point. It is marked on its end by a buoy (spar, black, No. 5) lying about 350 yards from the light-house.

Sandy Point Ledge makes out 600 yards in a southeast direction from **Sandy Point**, the point 1¾ miles **N. by E.** ½ **E.** from Fort Point. It has 4 feet near its end, which is marked by a buoy (spar, black, No. 7).

Unmarked shoals with 17 and 18 feet of water on them, lie from ⅛ to 1 mile **E. by N.** to **NE.** from Sandy Point Ledge buoy. They may be avoided by keeping Odom's Ledge beacon bearing to the eastward of **N.** ¼ **W.** until within ⅝ mile of it. An unmarked 13½ foot spot lies nearly ½ mile **SE.** from Odom's Ledge beacon.

Odom's Ledge lies near the middle of the river, about 1 mile above Sandy Point; it is ⅜ mile long in a **N. by E.** and **S. by W.** direction. Its northern end, which is awash at one-quarter ebb, is marked by a black stone beacon (with the letters O. L. in white on each side of it) lying 3 miles **N NE.** ¼ **E.** from Fort Point light-house. There is a good channel on either side of it.

CARVER'S HARBOR (VINAL HAVEN).†

This is a small harbor in the south side of Vinal Haven Island. It is much obstructed by rocks and ledges, and although the most dangerous are buoyed, a stranger should not attempt to enter without a pilot. The village of

† Shown on Coast and Geodetic Survey chart 310, scale $\frac{1}{40,000}$, price $0.25, and 104, scale $\frac{1}{80,000}$, price $0.50.

Vinal Haven is at the head of the harbor. A steamer runs to Rockland daily. The deepest draught of vessels entering is 11 feet; the greatest depth alongside the wharves is 10 feet.

The prominent features leading up to Carver's Harbor are **Saddleback Ledge light** (see table of lights, p. 16) from the eastward, and **Heron Neck light** (see table of lights, p. 16) from the westward. **Hurricane Island**—160 feet high, showing white and bare from the southward—is about 1¼ miles to the northwestward of Heron Neck light. Several prominent islands, the largest of which are Brimstone, Otter, and Robert's, lie in a broken line between Saddleback Ledge and Heron Neck, and southeast from the entrance to Carver's Harbor.

The channel is narrow and crooked and requires some local knowledge to take a vessel to the anchorage, which is small but well sheltered against all winds, and has a depth of 10 to 20 feet, soft bottom.

Pilots.—Branch pilots are on the lookout on shore and will come out to vessels making signal when the weather and sea will permit. Strangers should lie off and on about 1¼ miles to the southward of Heron Neck light until boarded. Pilots are sometimes taken from Rockland by vessels calling there and bound to Vinal Haven.

Supplies.—Water and a limited amount of coal may be obtained alongside of the steamboat wharf; stores and provisions in abundance.

Ice during January and February closes the harbor, but a channel is kept open up to the steamboat wharf.

Tides.—The mean rise and fall of tides is 9.3 feet.

Sailing directions of practical value to a stranger cannot be given. The chart will be the best guide if a pilot cannot be obtained.

HURRICANE SOUND (THE SOUND) AND ADJACENT WATERS.†

This is the body of water lying between Vinal Haven and Green Islands on the east, and Hurricane Island and the White Islands on the west; it has deep water but is little used except by local vessels and the vessels loading granite at Hurricane Island. Several passages lead into The Sound between the islands and ledges which surround it, but they are unfit for strangers, and there are no good anchorages. The principal passages into Hurricane Sound lead to the eastward of Hurricane Island, between it and Green Island, and to the northward of Hurricane Island, between it and the White Islands; the principal dangers in these passages are marked by buoys.

The Reach is a narrow, much obstructed channel, leading into The Sound from the southward, between Vinal Haven and Green Islands; some of the dangers in this channel are buoyed, but strangers require a pilot.

Lairey Narrows leads into the northern end of The Sound, between Leadbetter's Island on the north and Pole and Lairey islands on the south. This passage is narrow, and, though some of the dangers are buoyed, strangers should not attempt to enter it.

Leadbetter's Narrows is a narrow passage between the Vinal Haven shore on the north and Leadbetter's Island on the south; passing south on the eastern side of Leadbetter's Island it leads into the northern end of The Sound. This passage should not be attempted without a pilot.

The Basin is a large irregular bight in the west side of Vinal Haven Island about 2½ miles north of Heron Neck light; **Barton Island** lies in the middle of the entrance, leaving a narrow, crooked, and shallow channel north and south of it. The depth of water in the basin varies from 1½ to 18 fathoms; there are several small islands and rocky ledges near the northern entrance.

Old Harbor is a small cove at the northern end of The Reach, and northeast from the northern end of Green Island; it affords good anchorage for small vessels in 9 to 17 feet of water, soft bottom, but is unsafe for strangers.

It is impossible to give directions that would be of practical use to a stranger in these confined waters.

ROCKLAND HARBOR.‡

This harbor, one of the most important in Penobscot Bay, is on the west shore about 8 miles to the northeastward of Whitehead, between Owl's Head on the south and Jameson's Point on the north. It affords anchorage for the largest vessels, but is exposed to easterly winds; northeasterly winds raise a heavy sea in the eastern and southwestern parts, but shelter may be found behind the breakwater, which, in 1889, extended 1,900 feet in a southerly direction from Jameson's Point, and was being raised to the level of high water. A lantern light marks the end of the breakwater at night. The city of **Rockland**, on the western shore of the harbor, has a large trade in lime. A line of steamers from Boston and one from Portland touch here, and several small steamers ply to the islands in the bay. The usual draught of vessels entering Rockland is about 10 feet. Most of the wharves are dry, or nearly so, at low water, but there is from 8 to 15 feet alongside the three principal ones. The bottom is soft mud, and many vessels lie aground at low water while loading and unloading.

Rockland is the terminus of the Knox and Lincoln Railroad, which connects with the Maine Central Railroad at Bath.

Prominent objects.—**Owl's Head,** marked by **Owl's Head light** (see table of lights, p. 18) is on the southeastern side of the entrance to the harbor. A little over ¼ mile **NW.** from Owl's Head light-house, there is a large black tripod

†See foot note, page 98.

‡Shown on Coast and Geodetic Survey charts: **320**, scale $\frac{1}{20,000}$, price $0.20; **310**, scale $\frac{1}{40,000}$, price $0.25; and **104**, scale $\frac{1}{80,000}$, price $0.50.

called **Shag Rock Beacon.** **Jameson's Point,** on the northern side of the entrance, is low and grassy, with a large hotel a short distance back from its end; at low water the breakwater is very conspicuous. **Tillson's wharf** is one of the prominent features after entering the harbor; it is easily recognized by the large building on its end, which has a cupola on its southern gable.

The harbor is easy of access; the principal dangers are marked so that strangers can enter without difficulty.

Anchorages.—The anchorages are: 1st. In the northern part of the harbor, inside the breakwater, with the northern wharf on Crocketts' Point (the point on which Tillson's wharf is located), bearing to the westward of **NW.** by **W.** ¾ **W.**; anchorage will be found in 12 to 36 feet of water with good holding ground.

2nd. In the southwestern part of the harbor, inside Spear's Rock buoy, giving the south shore a berth of at least ¼ mile, and keeping the tall brown church spire in Rockland (Methodist Church) bearing to the northward of **NW.** by **W.** ¾ **W.**; in 12 to 36 feet of water, good holding ground.

3rd. In the middle of the harbor, between lines drawn from the buoys on South Ledge to the corners of Tillson's Wharf, and keeping at least 300 yards from the end of the wharf. A clear channel is thus left for the steamboats landing at Tillson's Wharf (see Harbor Regulations, Appendix II).

Pilots are not necessary to enter or leave this harbor, but if desired they can be found off Monhegan or Matinicus, or on any of the fishing vessels off the mouth of the bay. There are no regularly licensed pilots for this port.

Supplies.—Anthracite and bituminus coal can be obtained alongside the wharves. Fresh water can be obtained alongside Tillson's wharf or from a water-boat. Provisions and ship chandler's stores can be had in the city.

Repairs.—There are two marine railways, one capable of hauling out vessels of 700 tons, the other 300 tons; there are excellent facilities for repairs to sailing vessels and hulls of steamers. Light repairs to machinery can be made here, but Bangor is the nearest place affording facilities for extensive repairs.

There are no quarantine regulations for the port. (See Appendix II.)

Marine Hospital.—Medical attendance is furnished seamen from U. S. vessels by an acting assistant surgeon of the U. S. Marine Hospital Service. Patients requiring long-continued hospital treatment are sent to the U. S. Marine Hospital at Portland.

SAILING DIRECTIONS, ROCKLAND HARBOR.

1. ***Approaching and Entering.—From the Eastward or Southward.***—I. Having come through Eggemoggin Reach and followed the directions in Section 3 under that heading, when up to McIntosh Ledge buoy, steer **W.** by **S.** Give the end of the breakwater a berth of 100 yards or more and anchor within the anchorage limits described above.

II. *Or, having followed the directions in Section 1, "Sailing Directions, Fox Islands Thoroughfare,"* when Fiddler's Ledge beacon bears **N.**, distant about ¼ mile, steer **W NW.** ¼ **W.** Pass about ½ mile north of Owl's Head light and stand in to the harbor. Anchor within the anchorage limits described above.

III. *Or, having followed the directions in Sections 1 or 1 A, "Sailing Directions, West Penobscot Bay,"* when Fisherman's Island bears **W.** by **S.**, distant about 2 miles, steer **N NW.**, passing about ⅜ mile to the eastward of Munroe Island and Owl's Head. When Owl's Head light bears **SW.**, distant about ½ mile, steer about **NW.** by **W.** ½ **W.** and pass to the northward of South Ledge, between it and the breakwater; anchor within the limits described above.

IV. *Or, having followed the directions in Section 1, "Sailing Directions, Muscle Ridge Channel,"* Round Owl's Head, giving it a berth of at least ¼ mile, and when to the northward of it give the light a berth of ½ mile, then follow the directions in the preceding paragraph.

Remarks.—Standing into the harbor, the breakwater, with post light at end, should be made on the starboard bow. The buoys marking dangers will be readily distinguished as they are approached. **Tillson's wharf,** the landing for steamers, is the large stone pier with a brown building at its end, bearing about **W.** ½ **S.** from the end of the breakwater. Heavy draught vessels entering the harbor for the night usually anchor to the eastward of South Ledge. Standing to the westward into the harbor the water shoals gradually toward the wharves.

Dangers.—**Shag Rock** is a cluster of bare rocks about ¼ mile **NW.** by **N.** from Owl's Head light-house. A black, wooden tripod marks these rocks, which are avoided by giving the south shore a berth of over ¼ mile.

Spear's Rock, with 3½ feet of water over it, lies about 400 yards from the south shore of the harbor **S.** ¾ **W.** from the end of the breakwater and 1⅜ miles to the westward of Owl's Head. A buoy (spar, black, No. 1) is placed to the northward of the rock; vessels should not pass to the southward of the buoy.

Lowell Ledge, bare at low water, is a small cluster of rocks to the southwestward of Spear's Rock and a little closer in shore.

South Ledge lies in the middle of the harbor, about ⅜ mile **SE.** by **E.** ½ **E.** from the end of Tillson's wharf; it is about ¼ mile long in a **N NW.** and **S SE.** direction, with the shoalest water near its ends. Off its northern end is a black can-buoy, No. 5, and off its southern end a red spar-buoy, No. 2. The least water between these buoys is 7 feet, which is found near its southern end.

Jameson's Point Ledge is several rocky heads, with about 8 feet over them, lying about 150 yards in a **E NE.** and **W SW.** direction, 800 yards **E NE. ½ E.** from the northeastern corner of Tillson's wharf. Close to the southward of the eastern end of the ledge is a buoy (spar, red and black horizontal stripes).

Railway Ledge is a small rock, with a least depth of about 4 feet over it, lying about 200 yards **E SE. ½ E.** from the end of the marine railway pier, near the southern end of the town; it is marked by a buoy (spar, black, No. 3).

1 A. ***Approaching and Entering.—From the Northward.***—Standing down West Penobscot Bay pass ½ mile to the westward of The Graves and steer **SW. ½ S.** When the tall, brown church spire (Methodist Church) is in range with the end of the breakwater† bearing about **W.**, steer **W. ½ S.**, leave the end of the breakwater 100 to 200 yards on the starboard hand, and anchor within the anchorage limits described in "Anchorages," page 100.

Remarks.—On the **SW. ½ S.** course Rockport Harbor entrance will be passed, and Owl's Head light will be on the port bow. Rockland Harbor will be gradually opened beyond Jameson's Point, and the breakwater extending to the southward from the point will be plainly distinguished by the beacon and stake-light at its end. Standing into the harbor, and when past the breakwater, South Ledge and Jameson's Point Ledge buoys should be looked for, one on either bow.

For dangers see Section 1, preceding.

ROCKPORT HARBOR.‡

This is a small harbor on the west shore of the bay about 3½ miles to the northward of Rockland Harbor; it is easy of access and affords good anchorage for vessels of any size, sheltered from all except **S SE.** winds.

Rockport, the village at the head of the harbor, is a part of the town of Camden. The usual draught of loaded vessels entering is 13 feet; there is 14 feet at low water alongside the lower ice wharf; the other wharves have from 2 to 10 feet.

Prominent objects.—The Camden Mountains are very conspicuous, showing at the head of the harbor when it is approached from the southward. **Indian Island light** is on the northern side of the entrance (see table of lights, p. 18). **Porterfield Ledge beacon** (stone, with mast and barrel on top) is off the entrance and about ¾ mile **S.** by **W.** from Indian Island light-house. **Harbor Ledge beacon** (stone, with white cask on top) is well up in the head of the harbor; it should not be passed without a pilot.

The **usual anchorage** is to the southward of Harbor Ledge beacon in 3½ to 7 fathoms, soft bottom. There is good anchorage for light draught vessels inside Harbor Ledge beacon, but with little room for swinging. There are no harbor regulations, but a general rule to keep out of the fairway when anchored in the inner harbor.

Pilots.—Strangers entering the inner harbor should take a pilot. The piloting is done by fishermen who will board vessels making signal when off the entrance.

Supplies.—Water can be had at the wharves; provisions and ship chandler's stores in the village.

Repairs.—There is a tide dock where vessels can be calked and repairs made to hull.

Ice.—The harbor is frozen near its head in very cold weather, but the ice is not dangerous to shipping.

SAILING DIRECTIONS, ROCKPORT HARBOR.

1. ***Approaching and Entering.—From the Southward or Eastward.***—When Indian Island light is made steer for it, and when up to Porterfield Ledge beacon (gray stone, with mast and barrel on top) pass it about 200 yards on either hand and bring it to bear **S.**, then steer **N.** for Harbor Ledge beacon. Anchor to the southward of this beacon in from 3½ to 7 fathoms, soft bottom, or take a pilot if desiring to enter the inner harbor.

Remarks.—Standing up the western side of the bay, or coming from Rockland Harbor, care should be taken to avoid the ledges making out from Brewster Point. The western shore of Rockport Harbor is bold-to and may be approached to 200 yards until up to Harbor Ledge beacon.

The **N.** course from Porterfield Ledge beacon leads from 350 to 400 yards to the westward of Lowell Rock spindle, Indian Island light, and Seal Ledge spindle, and approaches the western shore to about 200 yards when half way between Seal Ledge spindle and Harbor Ledge beacon.

Dangers.—**Brewster Point Ledge** makes out ⅜ mile to the southeastward from Brewster Point. It is marked on its eastern end by black spar-buoy, No. 1. There is no safe passage between this buoy and the shore.

Ram Island Ledge makes out about ¼ mile to the northward and eastward from Ram Island, the small island **NE.** from Brewster Point. It is marked on its **NE.** end by black spar-buoy No. 3.

Porterfield Ledge is a small, rocky shoal, bare at low water, lying off the entrance to Rockport Harbor. It is marked by a gray stone beacon, with mast and barrel on top, lying ¾ mile **S.** by **W. ½ W.** from Indian Island light-house.

Lowell Rock is small and bare, with ledges connecting it to Indian Island. The ledge to the southward of the rock is marked by a red iron spindle, with cage and ball on top, lying 300 yards **S. ½ W.** from Indian Island light-house. There is a rock with 3 feet of water on it lying about 100 yards **S SE.** from the spindle.

† It has been proposed to extend the breakwater about 2,000 feet farther to the southward. In case this project is adopted, vessels should be careful in approaching to give the end of the breakwater a good berth.

‡ Shown on Coast and Geodetic Survey charts: **321**, scale, $\frac{1}{20,000}$, price $0.20; **310**, scale, $\frac{1}{40,000}$ price $0.25; and **104**, scale, $\frac{1}{80,000}$, price $0.50.

Seal Ledge, dry at half tide, makes out about 200 yards from the eastern shore of the harbor about ⅜ mile to the northward of Indian Island light. It is marked by a red iron spindle, with a cage on top.

Harbor Ledge, bare at low water, makes out 200 yards from the western shore of the harbor, near its head. It is marked on its eastern end by a gray stone beacon with cask on top. The channel leads to the eastward of it.

Ship Yard Ledge, bare at low tide, is on the western shore of the inner harbor. It is marked by a black iron spindle, with cage on top.

1 A. ***Approaching and Entering.—From the Northward.***—When Indian Island light is made steer so as to pass about ⅜ mile to the southward and eastward of it, taking care to avoid The Graves and give Lowell Rock spindle (red, iron, with cage and ball on top) a berth of nearly ¼ mile. Bring Porterfield Ledge beacon to bear **S.** and head **N.**; anchor as directed in Section 1, foregoing.

Dangers.—**The Graves** is a very dangerous, unmarked ledge with rocky heads showing at high water. It lies about ⅞ mile from the shore, 1¼ miles **S.** by **E.** from Negro Island light-house and 1½ miles **NE.** by **E.** ½ **E.** from Indian Island light-house. There is deep water all around it. See also the description on page 95.

For "Remarks" and "Dangers" entering, see Section 1, foregoing.

CAMDEN HARBOR.†

This is a small and well sheltered harbor on the west shore of the bay about 7 miles north of Owl's Head, affording good anchorage in 12 to 30 feet of water, good holding ground. It is not much used as a harbor of refuge, but vessels bound up or down the bay frequently anchor here for the night. The town of **Camden** is at the head of the harbor. The greatest draught of vessels loading here is 15 feet; from 7 to 10 feet draught can be taken into the inner harbor at mean low water. The steamboat wharf has 10 feet of water at low tide, the other wharves from 2 to 4 feet. The harbor is easy of access; the principal dangers are marked by buoys or spindles.

Prominent objects.—The Camden Mountains (the highest, **Mt. Megunticook**, 1320 feet) lie just back of and extend to the northward of Camden Harbor. **Negro Island light** (see table of lights, page 18) is on the southern side of the entrance.

The **anchorage** is in the outer harbor, north of Negro Island, in the entrance of **Sherman Cove**, and to the eastward of a line drawn from the steamboat wharf to Harbor Ledge buoy (spar, black, No. 3).

Pilots are not necessary to enter the outer harbor. Vessels bound up to the wharves and that require a pilot are generally taken up free of charge by stevedores. Strangers desiring a pilot can obtain one by making signal off the entrance.

Supplies.—Anthracite and bituminous coal and fresh water can be obtained at the wharves; provisions and ship chandler's stores in the town.

Ice sometimes forms in the harbor during January, February, and March, but is not dangerous to vessels in the outer harbor. Westerly winds clear the harbor of ice.

The mean rise and fall of tides is 9.7 feet.

SAILING DIRECTIONS, CAMDEN HARBOR.

1. ***Approaching and Entering.—From the Southward or Eastward.***—Bring Negro Island light (see table of lights, page 18) to bear anywhere between **W.** and **N.** by **E.**, except a half point each side of **N.** by **W.**, and steer for it, keeping a bright lookout for The Graves; when nearly up to the light change course so as to pass about 250 yards to the eastward of it; when it bears **W.** steer **N NW.**, and anchor between Eaton Point and North East Point in 4½ fathoms, soft bottom.

Dangers.—**The Graves** (see page 95 and Section 1 A, preceding).

Negro Island has shoal water on all sides except the southeast; there is no safe passage between it and Metcalf Point. **A rock** with 16 feet of water on it lies 150 yards **SE.** ½ **E.** from the light-house. The shoals off the northern end of the island are marked by Harbor Ledge buoy (spar, black, No. 3), which lies ¼ mile **N.** by **W.** ½ **W.** from the light-house, and should be left about ⅛ mile on the port hand, when on the **N NW.** course.

North East Ledges (inner and outer) extend in a southerly direction from North East Point, and contract the entrance of the harbor to about ¼ mile. They are partly exposed at half tide, and the **outer ledges** are marked on their northern end by black spar-buoy No. 1, and a black bell-buoy. **Inner Ledge** is marked by a black iron spindle with copper cylinder on top, **NE.** by **N.** about ⅜ mile from Negro Island light-house. The southern end of these ledges is marked by red spar-buoy No. 2, placed 300 yards **S SE.** from it.

1 A. ***Approaching and Entering.—From the Northward.***—Standing down West Penobscot Bay, give the western shore a berth of about 1 mile, and when Negro Island light bears **W.** head for it, passing close to the southward of red spar-buoy No. 2, and when 300 yards distant from the light, steer **N NW.** and follow the directions in Section 1, foregoing.

† See foot note, page 101.

Remarks.—There is a narrow passage, called **Northeast Passage**, between Northeast Point and Northeast Ledges. The channel leads about midway between the spindles marking the ledges, but it is so narrow and obstructed that strangers are advised not to attempt it.

Dangers.—**Dillingham's Ledge** is a rocky shoal, with 9 feet of water on it, marked on its southeastern side by black spar-buoy No. 1; see page 95.

Moxy's Reef is an unmarked 22-foot spot lying ⅝ mile from shore, and 1¼ miles **NE.** by **E.** from Negro Island lighthouse.

For description of remaining dangers see Section 1, foregoing.

BAGADUCE RIVER AND CASTINE HARBOR.†

The Bagaduce River empties into the eastern side of East Penobscot Bay about 23 miles from Saddleback Ledge light and about 4½ miles to the northward of the southwestern point of Cape Rosier. The entrance abreast the town of Castine is known as **Castine Harbor**. On the northern side of the entrance is **Dice's Head light** (see table of lights, page 18). This river is about 14½ miles long, with a narrow, crooked channel and several large bays and coves, the principal being **South Bay, Northern Bay**, and **Smith's Cove**; the latter is a good anchorage to the southeastward of Castine. About 3 miles above its mouth, a short distance above West Brooksville, the river is so narrow and obstructed by ledges that the tidal currents form rapids that are not passable except at slack water. A local knowledge of the river is necessary for its navigation, and strangers should not attempt to go above Castine without a pilot. The river is usually free from ice at Castine and for some distance above, but in very severe winters it is entirely closed.

Castine, a town on the north shore about 1 mile east of Dice's Head, has some commerce. Vessels of the deepest draught can enter Castine Harbor and find good anchorage sheltered from all winds; there is 16 to 18 feet alongside some of the wharves at low water. Castine has steamboat communication with Portland, Bangor, and Belfast. Pilots are not necessary for entering the harbor, but one may be obtained by signaling off the entrance. Vessels desiring pilots for the river above Castine can get one at the town. Tugs are not used by vessels entering the river but may be had from Bangor.

West Brooksville is a village on the east bank of the river about 2¾ miles above its mouth; there is 30 feet at low water in the channel up to the village. A line of steamers to Castine and Belfast touch here daily.

South Penobscot, a village on the east shore of Northern Bay, is about 7½ miles above the mouth of the river. Only small local vessels go there.

Prominent features.—Dice's Head, marked by Dice's Head light (see table of lights, page 18), is on the northern side of the entrance. **Holbrook's Island**—covered with trees except on the northwestern point, which is cleared and remarkably bare looking—lies ⅞ mile **S.** of Dice's Head light on the south side of the entrance. **Nautilus Island** lies about ⅝ mile **SE.** of Dice's Head light on the south side of the entrance. **Hosmer's Ledge monument** is of stone, with pole and cask on top, erected on Hosmer's Ledge on the south side of the harbor.

The channel is about 400 yards wide at the entrance and abreast of Castine; above this it widens a little to the anchorage in Smith's Cove (Lawrence's Bay). The principal dangers are marked by buoys.

The best anchorage is in Smith's Cove in 4 to 11 fathoms, soft bottom, sheltered from all winds. The holding ground abreast the town is not good, and the general depth of water is about 12 fathoms.

Supplies.—Anthracite coal in limited quantity and fresh water can be had at the wharf at Castine; provisions and ship chandler's stores can be obtained in the town.

Marine Hospital.—Relief is furnished under the provisions of the regulations of the Marine Hospital Service as to third-class stations (see appendix IV).

SAILING DIRECTIONS, CASTINE HARBOR.

1. ***Approaching and Entering.—From the Southward.***—Having followed the directions in Section 2, "Sailing Directions, East Penobscot Bay," or Section 2 A, "Sailing Directions, West Penobscot Bay," when Dice's Head light is made, steer for it on any bearing between **N NE. ¼ E.** and **NE. ¼ N.** When the light is about 1 mile ahead, steer more to the eastward until Otter Rock Shoal buoy (spar, black, No. 1) is made, then steer so as to pass about midway between it and Nautilus Island.

When Otter Rock Shoal buoy (spar, black, No. 1) bears **N.**, distant about 150 yards, steer **E NE. ½ E.**, leaving Hosmer's Ledge monument about 200 yards on the starboard hand. When Middle Ground buoy (spar, red, No. 2) bears about **NE.**, distant 300 yards, steer **SE.** by **E. ½ E.**, heading for the end of Henry's Point. Anchor in 4½ to 11 fathoms water from 200 to 500 yards to the westward or southwestward of the point.

See the remarks and dangers under Section 1 A, following.

† Shown on Coast and Geodetic Survey charts: **311**, scale $\frac{1}{40,000}$, price $0.25; and **104**, scale $\frac{1}{80,000}$, price $0.50.

1 A. ***Approaching and Entering.—From the Northward.***—When Dice's Head light is made, steer for it. Give Dice's Head a berth of ¼ mile while to the westward and southwestward of it, and shape a course so as to pass about midway between Nautilus Island and Otter Rock Shoal buoy (spar, black, No. 1), then follow the directions in Section 1, preceding.

Remarks.—Approaching the entrance, the western shores of Holbrook's and Nautilus islands should be given a berth of at least 150 yards. On the **E NE.** ½ **E.** course Henry's Point—bearing **E.** ½ **S.** from Hosmer's Ledge monument—will be seen on the starboard bow; the town of Castine will be on the port bow, and Smith's Cove will be opened to the southeastward as the town is approached.

Dangers.—Otter Rock Shoal, making out to the southeastward nearly ¼ mile from Dice's Head, is marked at its southern edge by a buoy (spar, black, No. 1).

Shoals make out to the northward and eastward from Nautilus Island, connecting it with the mainland. They may be avoided by giving the shore a berth of 200 to 300 yards.

Hosmer's Ledge, bare at half tide, and marked by a stone monument with pole and cask on top, lies on the south side of the channel ⅞ mile **E SE.** from Dice's Head light-house.

Middle Ground shows partly bare at low water, and lies off the upper end of the town. It is about ¼ mile long in an **E SE.** and **W NW.** direction, and is marked by an old stone monument, awash at half tide, and by a buoy (spar, red, No. 2) off its western side.

A small unmarked 15-foot shoal lies at the entrance of Smith's Cove, 800 yards **E.** ¼ **N.** from Hosmer's Ledge Monument. It may be avoided by giving Hospital Island a berth of ¼ mile.

There are several unmarked shoal spots off the western shore of Smith's Cove, about ⅜ to ½ mile **S.** by **W.** from Henry's Point.

BELFAST HARBOR.†

This is formed by the mouth of the Belfast River at the head of Belfast Bay, in the northwestern part of West Penobscot Bay. It affords good anchorage, but is exposed to southeasterly winds. The city of **Belfast** on its southwest side is of considerable commercial importance. The deepest draught of vessels entering is 15 feet; 10 to 11 feet is the usual draught; there is from 5½ to 15 feet of water alongside the wharves.

City Point is a village about 2 miles above Belfast, at the head of navigation on Belfast River; vessels of 6 to 10 feet draught go up at high water, passing through two draw-bridges; the lower one, long bridge, crosses the river at Belfast, and the upper bridge crosses about ⅔ mile farther up the river; the width of the draws is about 30 feet. The river is narrow and shallow and requires local knowledge for its navigation to City Point. Belfast and City Point are on a branch of the Maine Central Railroad. Steamers from Boston and New York touch at Belfast on their way to and from Bangor.

Prominent objects.—The houses and church steeples of the city of Belfast will be seen as soon as the northern end of North Islesboro is approached. Standing into Belfast Bay the stone beacon on Steele's Ledge will be seen toward the northern side of the bay near the entrance of Belfast River. Belfast Harbor is easy of access. The principal dangers are marked.

Anchorage.—The best and usual anchorage is in the channel between the lower steamboat wharf and the bridge in 12 to 15 feet, low water.

Pilots.—Strangers bound to Belfast desiring a pilot take one outside (see directions in regard to pilots, Penobscot River, page 97). Vessels unable to get a pilot in the bay should anchor to the southwestward of Steel's Ledge beacon until boarded by one.

Tow-boats are seldom used, but may be had from Bangor or Bucksport by telegraphing. The steamer running to Castine and Islesboro does towing sometimes when it does not interfere with her regular trips.

Supplies.—Anthracite coal in limited quantity, and fresh water can be obtained alongside the wharves. Provisions and ship chandler's stores can be had.

Repairs.—There are two marine railways capable of hauling out vessels of 800 tons; also good facilities for repairs to hulls and equipments of vessels. Bangor is the nearest place where repairs to machinery of steamers can be made.

Marine Hospital.—Relief is furnished by an acting assistant surgeon of the Marine Hospital Service, (see also Appendix IV).

Ice obstructs navigation from February to April; sometimes the whole bay is frozen across to Islesboro.

SAILING DIRECTIONS, BELFAST HARBOR.

1. ***Approaching and Entering.—From the Southward.***—Having followed the directions in Section 2, "Sailing Directions, West Penobscot Bay," until abreast of Great Spruce Head, steer about **N NE.** and change the course as necessary to follow the western shore, giving it a berth of about ½ mile. When Steele's Ledge beacon (gray stone with pole and barrel on top) is made bring it to bear **N.**, and steer for it until it is ⅜ mile distant, then steer **NW.** ¾ **N.** and anchor to the southward of Patterson's Point in 16 to 21 feet of water, soft bottom.

† Shown on Coast and Geodetic Survey charts: **319**, scale $\frac{1}{20,000}$, price $0.20; **311**, scale $\frac{1}{40,000}$, price $0.25; and **164**, scale $\frac{1}{80,000}$, price $0.50.

Vessels of 10 feet or less draught may continue the **NW. ¾ W.** course up to the city; vessels of greater draught should take a pilot.

Remarks.—On the **N.** course south point Steele's Ledge buoy (spar, red, No. 2), will be nearly in range with Steele's Ledge beacon and should be distant ¼ mile when the course is changed to **NW. ¾ N.** The western shore of the bay is comparatively bold-to and may be approached to ¼ mile except in the cove off the entrance to Little River. The northern shore, for a distance of ¾ mile to the eastward of Steele's Ledge, should be given a berth of ¼ mile.

Dangers.—**Steele's Ledge,** with 3 feet of water on it, is on the northern side of the entrance to the harbor and extends about ⅓ mile in a **N NW.** and **S SE.** direction. It is marked on its northern end by a buoy (spar, red, No. 4) and a beacon near its southern end. There is no safe passage between this buoy and the northern shore. The southern end is marked by a buoy (spar, red, No. 2) lying 200 yards to the southward of the beacon.

1 A. ***Approaching and Entering.—From the Northward or Eastward.***—From a position about ½ mile to the southward of Sears Island steer **W.** by **N.** and pass ⅜ mile to the southward of Steele's Ledge beacon; then follow the directions in Section 1, foregoing.

Or, from a position about ½ mile to the northward of Turtle Head, steer **NW.** by **W. ½ W.** and pass about ⅜ mile to the southward of Steele's Ledge beacon; then proceed as directed in Section 1, foregoing.

Remarks.—There are no dangers approaching from the northward or eastward, except Brigadier Island Ledge, described on page 96. The dangers at the entrance of the harbor are described under Section 1, foregoing.

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PART II.

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UNITED STATES COAST PILOT.

ATLANTIC COAST—PART II.

FROM WHITEHEAD TO CAPE ANN.

COAST OF MAINE, NEW HAMPSHIRE, AND MASSACHUSETTS, FROM WHITEHEAD, ME., TO CAPE ANN, MASS.†

Note.—For description of Gulf of Maine, see pages 11–12; for Sailing Directions along the coast from the St. Croix River to Cape Ann, see pages 20–26.

From Whitehead to Cape Elizabeth, a distance of 53 miles, the general direction of the shore is about **W SW.** ¾ **W.**; it then changes to **SW.** ¼ **W.** for a distance of 47 miles, to Great Boar's Head, near Hampton, N. H. From Great Boar's Head the shore trends about **S.** by **W.** for a distance of 6½ miles, to the Merrimack River, then more to the southward, and southeastward for a distance of 7 miles to Ipswich Harbor, and from thence to the eastward and northeastward to Cape Ann, forming the bight known as Ipswich Bay. The direction and distance from Whitehead, Me., to Cape Ann lights, Mass., is **SW.** ⅝ **W.**, about 102 miles.

Between Whitehead and Cape Elizabeth the coast is rocky and very much broken by numerous bays and rivers, many of which are excellent harbors. These indentations, and the islands lying in them, have a general **N NE.** and **S SW.** direction. In Muscongus and Casco bays good channels lead between the islands, affording inside passages that are much used by the smaller class of vessels passing along the coast. Great caution is necessary when standing along this stretch of the coast in thick weather on account of the numerous dangers which in some cases lie nearly 10 miles off shore. Between Cape Elizabeth and Great Boar's Head there are fewer harbors and marked indentations; the latter are generally broad bights with strips of sand beach between well-marked rocky points. The shore is more thickly settled than farther to the eastward, several of the beaches being popular summer resorts. The outlying dangers are well marked and fewer in number. To the southward of Great Boar's Head the coast is low and generally a sandy beach, with a few outcropping ledges and outlying dangers, but the northern shore of Cape Ann is high and rocky.

Harbors and Anchorages.—The principal harbors of refuge are: Tennant's Harbor, Herring Gut, Boothbay, Ebenecook Harbor in Sheepscot River, Harpswell Sound, Portland Harbor, and Portsmouth Harbor; these and other harbors along the coast are described under their separate headings.

Prominent features.—*Monheyan Island*, lying 9¼ miles from the mainland, is 160 feet high and a mark for all vessels bound into Penobscot Bay from the westward. *Seguin Island* lies about 2¼ miles from the mainland off the mouth of the Kennebec River; the island is about 145 feet high and a mark for vessels bound into the river or standing along the shore. *Cape Elizabeth*, the southern point at the entrance to Portland Harbor, is about 90 feet high. *Agamenticus Mountain* is 728 feet high and the most prominent landmark between Portland and Cape Ann. It is about 4½ miles inland and 9 miles to the northeastward of Portsmouth. The *Isles of Shoals*, lying about 5½ miles from the shore and to the southeastward of Portsmouth Harbor entrance, can be seen a long distance, the large hotels being conspicuous marks. *Boon Island light* is about 11¼ miles to the northeastward from the Isles of Shoals and about 6½ miles off shore. *Cape Ann*, at its northern end, is high, but its eastern end is comparatively low. The two light-towers on Thatcher's Island are the most conspicuous marks seen when approaching the cape.

Lights and other aids.—At night, in clear weather, no difficulty should be experienced by vessels approaching or standing along the coast, as the lights are numerous and can be readily distinguished (see table, pages 112–115). Vessels approaching the coast will sight some of the lights before approaching any of the outlying dangers. Buoys or spindles mark the principal dangers along the shore and in the channels most frequently used. The buoys accord with the system adopted in U. S. waters (see page V). In thick weather special attention should be paid to the fog-signals at the different light-houses, and bell and whistling buoys. See also "Aids to Navigation," page 13.

† Shown on Coast and Geodetic Survey charts: A, scale $\frac{1}{1,200,000}$, price $1.00; 5b, scale $\frac{1}{400,000}$, price $0.50; and 105, 106, 107, 108, scale of each $\frac{1}{80,000}$, price of each $0.50.

Pilots.—Pilotage is not compulsory for ports in the State of Maine. Fishermen and others competent to take vessels into the ports of the State can usually be found along the coast; they will board any vessel making the pilot signal. There are licensed pilots for the port of Portland (see "Pilots" under heading Portland Harbor, and Appendix II).

Pilotage is not compulsory for enrolled or registered vessels of the United States in the ports of New Hampshire, and only for other vessels when a pilot offers his services (see Appendix II).

Pilotage is compulsory for ports in Massachusetts except for passenger steam vessels regulated by the laws of the United States and carrying a pilot commissioned by United States Commissioners, vessels regularly employed in the coasting trade, fishing vessels other than whalers, and vessels of less than 7 feet draught of water. All other vessels are obliged to pay pilotage.

Tow-boats can be had at Wiscasset, in the Kennebec and Merrimack rivers, and in Portland and Portsmouth harbors (see also "Tow-boats" under the different headings).

Quarantine.—The quarantine laws for Maine govern the ports in that State and local boards of health have the power to make quarantine regulations for the ports under their control. Health officers in the State of New Hampshire have authority to make regulations respecting quarantine for ports in the State. The Board of Health in each seaport town of Massachusetts has authority to regulate quarantine for the port. For Quarantine Laws, see Appendix II.

Harbor Control.—For ports in the State of Maine, local municipal officers have the power to appoint harbor masters; port wardens are elected by the city or town. The city of Portsmouth provides a harbor master for Piscataqua River and Portsmouth Harbor. Harbor masters are appointed for ports in Massachusetts; they have charge of the anchorage and berthing of vessels. For harbor control and regulations, see Appendix II.

U. S. Marine Hospital Service.—There is a U. S. Marine Hospital at Portland; relief stations with acting assistant surgeons at Bath, Me., and Portsmouth, N. H., and relief is furnished under the provisions of the regulations for third class stations at Waldoboro and Wiscasset. For Regulations U. S. Marine Hospital Service, see Appendix IV.

Supplies.—Coal can be obtained in quantities at Bath, Portland, and Portsmouth. Water, provisions, and ship chandler's stores can be obtained at these places and at a number of smaller towns. See "Supplies," under the different headings.

Repairs.—Bath and Portland are the principal places at which extensive repairs to the hulls of vessels and machinery of steamers can be made. Minor repairs can be made at several other places. See "Repairs," under the different headings.

For **Ice, Fogs, Winds,** and **Freshets,** see pages 13, 14.

Tidal Currents.—In standing along the coast well in shore, allowance should be made for the tidal currents. The flood sets to the eastward and into the bays and rivers, and the ebb to the westward and out of the bays and rivers. Between Penobscot Bay and Cape Ann the westerly (ebb) set is usually the most marked, and between Portland and Cape Ann this is allowed for in thick weather by vessels making regular trips along this part of the coast. See also pages 13, 14.

BEARINGS AND DISTANCES.

Monhegan Island Light-house.—The following are bearings and distances from Monhegan Island Light-house:

	Miles.
Marshall's Point Light-house, N NE. $\frac{5}{8}$ E	9¼
Tennant's Harbor Light-house, NE. ¼ N	13
Whitehead Light-house, NE. ¼ E	15¼
Cape Cod (Highlands) Light-house, S SW. ¾ W	108
Boston Light-house, SW. $\frac{5}{8}$ W	110
Cape Ann Light-houses, SW. ¾ W	87
Isles of Shoals Light-house, SW. by W. $\frac{5}{8}$ W	74
Boon Island Light-house, SW. by W. $\frac{7}{8}$ W	63
Wood Island Light-house, W. ¾ S	47¼
Cape Elizabeth (East) Light-house, W. $\frac{5}{8}$ S	40
Halfway Rock Light-house, W. ⅛ N	31¼
Seguin Light-house, W. ¼ N	19¼
Ram Island Light-house, NW. by W. ¾ W	12¼
Pemaquid Point Light-house, NW. ¼ W	9¼

Seguin Island Light-house.—The following are bearings and distances from Seguin Light-house:

Pond Island Light-house, N. ¼ W	2
Hendrick's Head Light-house, NE. ¾ N	7¼
Ram Island Light-house, NE. by E. ¾ E	9
Cape Cod (Highlands) Light-house, S. by W. ¾ W	100¾

Seguin Island Light-house.—Bearings and distances from Seguin Light-house—Continued.

	Miles.
Minot's Ledge Light-house, SW. ½ S	96
Cape Ann Light-houses, SW. ¼ S	73
Isles of Shoals Light-house, SW. ¾ W	57¾
Boon Island Light-house, SW. ⅞ W	46¾
Wood Island Light-house, W SW. ⅝ W	28¾
Cape Elizabeth (East) Light-house, W. ⅞ S	20¾
Portland Head Light-house, W	20
Halfway Rock Light-house, W	12⅝

Cape Elizabeth (East) Light-house.—The following are bearings and distances from Cape Elizabeth (East) Light-house:

Halfway Rock Light-house, E NE	8¾
Matinicus Rock Light-houses, E. ⅓ S	60
Cape Cod (Highlands) Light-house, S. ¾ W	91½
Cape Ann Light-houses, S SW. ⅝ W	58
Isles of Shoals Light-house, SW. ½ S	40¼
Boon Island Light-house, SW. ¾ S	29½
Wood Island, Light-house, SW. ¾ W	8⅓

Boon Island Light-house.—The following are bearings and distances from Boon Island Light-house:

Wood Island Light-house, N NE. ¾ E	21
Halfway Rock Light-house, NE	37½
Matinicus Rock Light-houses, E NE. ¾ E	81
Cape Cod (Highlands) Light-house, S. ¼ E	67½
Cape Ann Light-houses, S SW	29
Isles of Shoals Light-house, SW. ⅝ W	11¼
Cape Neddick Light-house, NW. ¼ W	5⅓

Isles of Shoals Light-house.—The following are bearings and distances from Isles of Shoals Light-house:

Cape Neddick Light-house, N. by E. ⅞ E	12
Wood Island Light-house, NE. ⅝ N	32
Halfway Rock Light-house, NE. ⅛ E	48½
Matinicus Rock Light-houses, E NE. ¼ E	90½
Cape Cod (Highlands) Light-house, S. by E	61
Cape Ann Light-houses, S. ¾ W	20
Annisquam Light-house, S. by W. ¾ W	18½
Ipswich Light-house, SW. by S	18
Newburyport Light-house, SW. by W	12½
Portsmouth Harbor (New Castle) Light-house, N. by W. ⅝ W	7¼

Cape Ann Light-houses.—The following are bearings and distances from Cape Ann Light-houses:

Portsmouth Harbor (New Castle) Light-house, N	26¼
Cape Neddick Light-house, N. by E	31½
Wood Island Light-house, N NE. ⅝ E	50½
Halfway Rock Light-house, NE. ¾ N	65½
Matinicus Rock Light-houses, NE. by E. ¼ E	102
Cape Cod (Highlands) Light-houses, S. by E. ¾ E	42½
Minot's Ledge Light-house, SW. by S	23½
Boston Light-house, SW. ⅝ W	23

LIGHT-HOUSE DISTRICT, ETC.

The coast and the waters covered by Part II of this volume lie partly in the **First** and **Second Light-house Districts** of the United States. The part embraced in the First District extends from Whitehead to and includes Hampton Harbor, N. H.; that embraced in the Second District, from Hampton Harbor to and including Cape Ann. The Light-list for the sea-coasts of the United States, and the Buoy-lists for the First and Second Districts give full descriptions of the aids to navigation. These pamphlets, which are corrected and reprinted from time to time, are sent free of charge to any shipmaster on application to the Light-house Board, Washington, D. C., or to the Inspectors of the districts. The address of the Inspector of the First District is Custom House, Portland, Me., and of the Second District, Post Office Building, Boston.

TABLE OF LIGHTS.

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	Tennant's Harbor	43 57 40 69 11 07	Fixed red, varied by a red flash every minute.	5	69	10
2	Marshall's Point	43 55 03 69 15 42	Fixed white	5	31	10
3	MONHEGAN ISLAND	43 45 53 69 18 59	Flashing white, every minute	2	175	19
4	Manana Island Fog-Signal Station	43 45 47 69 19 37				
5	Franklin Island	43 53 32 69 22 31	Fixed white, varied by a white flash every 90 sec.	4	54	12
6	PEMAQUID POINT	43 50 13 69 30 23	Fixed white	4	75	14
7	Ram Island	43 48 (14) 69 35 (54)	Fixed red, with two fixed white sectors; easterly white sector between W. ¼ N. and W. ¾ N.; westerly white sector between NE. ¼ N and NE. by E. ¾ E.	4	35½	11
8	Burnt Island	43 49 31 69 38 27	Fixed red, with two fixed white sectors; SE. white sector between NW. ½ N. and N NW. ¾ W.; southerly white sector between N. ¾ E. and N. by E. ⅞ E.	4	61	13
9	Hendrick's Head	43 49 22 69 41 25	Flashing white, every 30 sec.	4	40	12
10	Pond Island	43 44 24 69 46 15	Fixed white	5	54	13
11	SEGUIN	43 42 26 69 45 32	Fixed white	1	180	19½
12	CASCO BAY. HALF-WAY ROCK	43 39 22 70 02 14	Fixed white, varied by a red flash every 90 sec.	3	80	15
13	CASCO BAY. CAPE ELIZABETH (E. light)	43 33 58 70 12 02	Fixed white	1	143	18
14	CASCO BAY. CAPE ELIZABETH (W. light)	43 33 51 70 12 11	Fixed white, varied by a white flash every minute.	2	143	18
15	CASCO BAY. PORTLAND HEAD	43 37 23 70 12 30	Fixed white	2	101	15¾
16	CASCO BAY. Portland Breakwater	43 39 20 70 14 07	Fixed red, varied by a red flash every 40 sec.	5	23	8
17	Wood Island	43 27 24 70 19 46	Fixed red, varied by a red flash every minute.	4	74	14
18	Goat Island	43 21 28 70 25 (32)	Fixed white	6	38	11
19	THE KNUBBLE (Cape Neddick)	43 09 (54) 70 35 (31)	Fixed red	4	92	11¾
20	BOON ISLAND	43 07 17 70 28 37	Fixed white	2	133	18
21	WHALE'S BACK	43 03 32 70 41 49	Fixed white, varied by a white flash every 90 sec.	4	65	13
22	Portsmouth Harbor (New Castle)	43 04 16 70 42 33	Fixed white	4	70	14
23	ISLES OF SHOALS	42 58 02 70 37 26	Flashing alternately red and white; interval between flashes, 15 sec.	2	87	15
24	Newburyport Harbor	42 48 55 70 49 10	Fixed white	4	50	12
25	Range light (front)	42 49 (15) 70 49 (12)	Fixed red	Lantern	26	
26	Range light (rear)	42 49 (16) 70 49 (17)	Fixed white	Lantern	36	
27	Upper Harbor (Outer beacon)	42 48 42 70 51 55	Fixed red	Refl'r	25½	
28	Upper Harbor (Inner beacon)	42 48 41 70 52 00	Fixed green	Refl'r	47½	

WHITEHEAD TO CAPE ANN.

Number.	Color and peculiarity of light-house or vessel.	Height, in feet, from base of structure to center of lantern.	Fog-signal.
1	White tower and dwelling, connected by a work-room	26	Hand-bell, rung in answer to signals.
2	White tower, with a covered way, extending nearly to white dwelling	24	Hand-bell, rung in answer to signals.
3	Gray granite tower, connected with a white dwelling by white covered way. Another white dwelling stands to the southward of the tower.	36	
4	A brick signal-house, with a white dwelling near		1st-class Daboll trumpet; blasts 15 sec., intervals 40 sec. If trumpet be disabled, a bell will be struck by hand
5	White tower and dwelling, connected by a work-room	35	Hand-bell, rung in answer to signals.
6	White tower and dwelling, connected by a work-room	32	Hand-bell, rung in answer to signals.
7	Tower of granite to height of 20 feet, white above; connected with shore by an open bridge. White dwelling on shore near end of bridge.	39½	
8	White tower and dwelling, connected by a covered way and porch	24	Hand-bell, rung in answer to signals.
9	Square white tower and dwelling connected by a covered way	30	Hand-bell, rung in answer to signals.
10	White tower and dwelling connected by a work-room. Fog-bell hung from framework, 200 feet S. of tower.	18	Bell struck by machinery seven times a minute.
11	Gray granite tower, connected with dwelling by a work-room. A brick fog-signal building and white frame dwelling about 250 feet S. of tower.	35	10-inch steam-whistle; blasts 8 sec., intervals 52 sec. If steam-whistle be disabled, a bell will be struck by hand.
12	Gray granite tower, with frame boat-house attached on NW. side. Pyramidal skeleton bell-tower to SW. of tower and pyramidal skeleton building northwesterly of it.	66	Bell struck by machinery every 10 sec.
13	Two towers painted brown, with white bases, 923 feet apart, ranging SW. by W. and NE. by E. White dwelling near each tower, and a third white dwelling between. White fog-signal house on extreme E. point of the cape, about 300 yards from E. tower. Life-saving station near fog-signal house.	53	2d-class steam-siren; two blasts of 5 sec. each, with alternate intervals of 8 sec. and 42 sec. If steam-siren be disabled, a 10-inch steam-whistle will be sounded.
14		53	
15	White tower and dwelling, connected by porch. White fog-signal house near the tower to the eastward.	69	2d-class Daboll trumpet; blasts 8 sec., intervals 40 sec. If Daboll trumpet be disabled, a bell will be struck by hand.
16	Brown tower on end of the granite breakwater	17	
17	White tower and dwelling connected by a porch. A white pyramidal bell-tower, about 30 feet high, stands to the southward.	47	Bell struck by machinery, a double and a single blow alternately, with intervals of 25 sec.
18	White tower connected with a dwelling by a covered way	25	Hand-bell, rung in answer to signals.
19	Conical brown tower; lantern, black. White dwelling stands 50 feet N. of tower. Framework for fog-signal near tower.	40	Bell struck by machinery every 15 sec.
20	Gray granite tower and dwelling, with framed, white upper story, connected by a work-room.	123	Bell rung in answer to signals.
21	Gray granite tower, rising directly from the ledge. Red fog-signal tower to the northward.	69	3d-class Daboll trumpet; blasts 10 sec., intervals 30 sec.
22	Brown tower, with white foundation, near an unfinished fort	60	Hand-bell, rung in answer to signals.
23	White tower standing alongside of the old stone tower, from which a covered way extends nearly to the white dwelling.	40	Hand-bell rung in answer to signals.
24	White octagonal tower; lantern, black. White dwelling and outbuildings S. of main tower, within 100 feet of it.	35	
25	On posts 425 feet apart on a line ranging approximately NW. by W. (magnetic).		
26			
27	Brown circular tower; lantern, black, on the E. corner of Bailey's Wharf	19½	
28	Pyramidal red-brick tower; lantern, black	37	

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.
		° ′ ″				
29	Ipswich	42 41 07 70 46 (00)	Fixed white, varied by a white flash every 90 sec.	5	50	12½
30	Beacon (Ipswich Harbor range)	42 41 08 70 46 00	Fixed white	Refl'r	20	-------
31	Annisquam Harbor	42 39 43 70 40 55	Fixed white	5	50	12½
32	Straitsmouth	42 39 44 70 35 19	Fixed white	6	33	11
33	CAPE ANN	42 38 21 70 34 31	Fixed white	1	165½	19
34		42 38 13 70 34 32	Fixed white	1	165½	19

NOTE.—All bearings are MAGNETIC, and in case of visibility of lights given from SEAWARD.

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

1st. PRIMARY SEA-COAST LIGHTS.

2d. SECONDARY SEA-COAST LIGHTS AND LAKE-COAST LIGHTS.

3d. *Light-vessels.*

4th. Sound, bay, river, and harbor lights.

The geographical positions of light-houses 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: 30° 45′ (57″).

WIND-SIGNAL STATIONS—WHITEHEAD TO CAPE ANN.

The wind-signals of the U. S. Signal Service are shown for the benefit of mariners at the following points. The list of stations is corrected to January, 1891. The signals are described and their meaning is explained in Appendix III.

Whitehead, Me.
Portland, Me.
Portsmouth, N. H.
Newburyport, Mass.

UNITED STATES LIFE-SAVING STATIONS—WHITEHEAD TO CAPE ANN.

The following list of life-saving stations has been corrected to January, 1891. These stations are furnished with life-boats, mortars, and all other appliances for affording assistance in case of shipwreck. †

NAME OF STATION.	STATE.	LOCALITY.	APPROXIMATE POSITION. Latitude, north.			Longitude, west.		
			°	′	″	°	′	″
Hunniwell's Beach	Me	On west side Kennebec River entrance, ¾ mile N NW. from Pond Island light.	43	45	00	69	46	55
Cape Elizabeth	Me	A little over ½ mile S. from Cape Elizabeth East light.	43	33	58	70	12	00
Fletcher's Neck	Me	About 1 mile SW. from Wood Island light	43	26	30	70	20	30
Jerry's Point	N. H	On west side Portsmouth Harbor entrance, ¾ mile W. from Whale Back light.	43	03	30	70	42	45
Wallis Sands	N. H	On the beach, 2¼ miles SW. ¼ W. from Whale Back light.	43	01	15	70	44	00
Rye Beach	N. H	On the beach 4⅓ miles SW. from Whale Back light	42	59	30	70	45	20
Plum Island	Mass	On south side of entrance to Merrimack River (Newburyport Harbor).	42	48	30	70	49	00
Davis' Neck	Mass	On eastern side of Ipswich Bay, ⅝ mile NE. ¾ E. from Annisquam light.	42	40	10	70	40	20

† 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.

WHITEHEAD TO CAPE ANN—Continued.

Number.	Color and peculiarity of light-house or vessel.	Height in feet, from base of structure to center of lantern.	Fog-signal.
29	White tower; lantern, black. White dwelling and barn to westward of tower	30	
30	Small square white house; half of front side black	15	
31	White octagonal tower, connected with dwelling by a covered way 100 feet long; lantern, black.	34	
32	White octagonal tower; lantern, black. Plank walk over the rocks to upland, toward a white dwelling.	24	
33	Two gray stone towers, 895 feet apart, ranging N. by E. ¾ E. and S. by W. ¾ W.; lanterns, black. Work-rooms stone-color; covered walks and northern dwelling white; one southern dwelling brick-color and one white. A drab house stands W. of the brick dwelling. Brick fog-signal house near easterly shore of island.	112½	10-inch steam-whistle; blasts of 8 and 4 sec. with alternate intervals of 4 and 44 sec.
34		112½	

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. The table on the following page shows how the calculations may be made.

In the column of "Characteristics of light," the time between flashes is given from the beginning of one flash to the beginning of the next succeeding one. The bearings given are *magnetic, and in case of visibility of lights are given from seaward.*

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.

MASSACHUSETTS HUMANE SOCIETY LIFE-SAVING STATIONS—COAST OF MASSACHUSETTS NORTH OF CAPE ANN.

NO. OF STATION.	LOCALITY OF STATION.	APPARATUS.
1	A short distance to the southeastward of Annisquam light.	Life-boat.
2	At Rockport	Hunt gun and life-car.
3	At Rockport	Life-boat and life-dory.

VARIATION OF THE COMPASS.

The variation is given for localities along the coast between Whitehead, Me., and Cape Ann, Mass.

LOCALITY.	Compass variation, 1890.	Present annual increase.
Off Monhegan	15½°	2½′
Muscongus Bay Entrance	15⅛°	2½′
Boothbay Entrance	15°	2½′
Off Seguin, Kennebec Entrance	14¾°	2¾′
Off Cape Elizabeth	14⅛°	2¾′
Off Cape Porpoise	13¾°	2¾′
Off Isles of Shoals	13⅛°	3′
Newburyport Harbor Entrance	13°	2¾′
Off Cape Ann	13⅛°	3′

TIDES—WHITEHEAD, ME., TO CAPE ANN, MASS.†

GENERAL TABLE.

LOCALITY.	CORRECTED ESTABLISHMENT.	CORRECTION FOR STANDARD TIME.	MEAN RISE AND FALL.			MEAN DURATION OF			RISE OF HIGHEST TIDE OBSERVED.
			Mean tides.	Spring tides.	Neap tides.	Rise.	Fall.	Stand.	
	h. m.	Min.	Feet.	Feet.	Feet.	h. m.	h. m.	Min.	Feet.
Tennant's Harbor	10 54	—23	9.4	10.8	8.0	6 14	6 11	.....	10.9
Herring Gut (Port Clyde)	10 56	—23	9.4	10.8	8.0	6 14	6 11	.....	11.2
Thomaston	11 21	—23	10.0	11.5	8.5	6 14	6 11	.....	.....
Broad Cove	11 08	—22	9.4	10.8	8.0	6 15	6 10	.....	.....
Waldoboro	11 28	—22	10.0	11.5	8.5	6 14	6 11	.....	12.1
Damariscotta River Entrance	11 00	—22	9.0	10.3	7.7	6 15	6 10	.....	10.5
Boothbay	10 59	—21	9.4	10.8	8.0	6 15	6 10	.....	.....
Sheepscot River Entrance	10 59	—21	9.5	10.9	8.1	6 15	6 10	.....	.....
Wiscasset	11 23	—21	9.8	11.3	8.3	6 14	6 11	27	.....
Kennebec River Entrance	11 24	—21	8.3	9.5	7.1	6 23	6 02	22	9.9
Bath	12 13	—21	6.9	7.9	5.9	5 57	6 28	.....	7.9
New Meadows River, Foster's Point	11 33	—20	8.9	10.2	7.6	6 13	6 12	.....	11.4
Harpswell Harbor	10 55	—20	8.9	10.0	7.8	6 19	6 06	.....	11.1
Portland Harbor	11 17	—19	9.1	10.5	7.7	6 15	6 10	.....	11.3
Richmond's Island	11 00	—19	8.6	9.9	7.3	6 15	6 10	35	11.4
Saco River Entrance	11 07	—18	8.9	10.2	7.6	6 15	6 10	.....	.....
Kennebunkport	11 15	—18	8.9	10.2	7.6	6 14	6 11	.....	.....
Portsmouth Harbor	11 23	—17	9.2	10.6	7.8	6 14	6 11	21	11.4
Newburyport Harbor	11 23	—17	7.9	9.0	6.8	6 13	6 12	24	10.4
Ipswich Entrance	11 17	—17	8.8	10.1	7.5	6 08	6 17	30	11.0
Annisquam	11 13	—17	8 8	10.1	7.5	6 13	6 12	21	11.8
Rockport Harbor	10 57	—18	8.6	9.9	7.3	6 14	6 11	30	10.1

† See the foot note on page 15.

Note.—For remarks on approaching the Coast and Sailing Directions along shore from the St. Croix River to Cape Ann, see pages 20–26.

TENNANT'S HARBOR.†

This is an excellent anchorage, and is much used as a harbor of refuge. It lies 3 miles **W. ½ S.** from Whitehead, and its entrance is marked by **Tennant's Harbor light** (see table of lights, page 112). It is open to the eastward, and an easterly gale raises a choppy sea in the harbor, but vessels with good ground tackle can ride in safety. The village of **Tennant's Harbor** is on the northern shore, near the head of the harbor; vessels of 10 feet draught can go alongside of the wharves, but they lie aground at low water. The channel is free from dangers and shoals gradually to the westward.

Long Cove, making to the northward from the entrance of Tennant's Harbor, has several stone quarries where vessels load granite; 10 feet is their usual loaded draught.

Anchorage.—Vessels of the deepest draught may anchor midway between the western ends of Northern and Southern islands; light draught vessels anchor more toward the head of the harbor. The bottom is mostly soft mud, and good holding ground.

Pilots.—Vessels entering for an anchorage do not require a pilot; strangers bound to the quarries in Long Cove take one from Northern Island.

Supplies.—Anthracite coal, provisions, and ship chandler's stores can be obtained here.

Repairs.—There is a marine railway capable of hauling out vessels of 400 tons, length of cradle 120 feet on blocks; extreme draught of vessels taken out 9 feet. There are also good facilities for repairing vessels. Ice seldom obstructs the harbor; during extremely cold weather it is sometimes frozen over for a few days.

For tidal data, see the above table.

SAILING DIRECTIONS, TENNANT'S HARBOR.

1. ***Approaching and Entering.—From the Northward or Eastward.—Coming through Muscle Ridge Channel.*** When the bell-buoy off South Breaker bears **SE.**, distant about 350 yards, steer **W. ¾ N.**; pass about ¼ mile to the northward of Tennant's Harbor light and midway between Northern and Southern islands. Anchor about ¼ mile **E SE.** from the stone wharf, on the northern side of the harbor, in 21 feet water, soft water. Deep draught vessels can anchor more to the eastward. Give the southern shore of the harbor a berth of 250 yards; the northern shore is bold-to.

†Shown on Coast and Geodetic Survey charts: 312, scale $\frac{1}{40,000}$, price $0.25; and 165, scale $\frac{1}{80,000}$, price $0.50.

Coming through Two Bush Channel.—From about ¼ mile to the southward of Crow Island Ledge buoy (spar, red, No. 2) steer **NW.** by **W.** ½ **W.**; pass about ¼ mile to the northward of Tennant Harbor light, steer **W.** ¾ **N.** and proceed as directed in the preceding paragraph.

Remarks.—Approaching Tennant Harbor either from the northward or eastward Tennant Harbor light, on **Southern Island**, should be a little on the port bow. The channel to Long Cove lies 150 to 200 yards to the westward of the southwest end of **Northern Island**, the island on the north side of the entrance. To the westward of the channel is a long ledge of rocks awash at half tide.

Dangers.—**Norton Island Ledges**, a large unmarked shoal, with places bare at low water, lies ⅝ to 1 mile **W.** from Whitehead Island and should be left about ⅝ mile on the starboard hand coming from Muscle Ridge Channel.

Seaveys Ledge, an unmarked shoal about ½ mile to the westward of Norton Island Ledges, has some spots bare at low water and should be left about ¼ mile on the starboard hand when on the **W.** ¾ **N.** course.

On the northern side of the harbor, to the westward of the first stone pier, are several spots with 4 to 9 feet over them.

There are no dangers approaching Tennant Harbor on the **NW.** by **W.** ½ **W.** course. Southern Island should be given a berth of at least 150 yards.

1 A. ***Approaching and Entering.—From the Westward.***—Follow the directions in Section 1 A, "Sailing Directions," West Penobscot Bay (page 94), and when Tennant Harbor light bears **N.** by **E.** steer for it, and when nearly up to it haul to the eastward and round the light, giving Southern Island a berth of 200 to 300 yards. When the light bears **S.**, steer so as to pass midway between Northern and Southern islands; then steer **W.** ¾ **N.** and anchor as directed in Section 1, foregoing.

Dangers.—**Hart's Ledge**, an unmarked rocky shoal, with spots bare at low water, makes out ¼ mile to the eastward from Hart's Neck, ¾ mile **SW.** by **S.** from Tennant Harbor light-house.

A ledge, showing partly bare at half tide, makes off to the eastward from the western side of the entrance to Long Cove.

HERRING GUT, PORT CLYDE.†

Herring Gut is an excellent though small anchorage, lying between Marshall Point and Hooper's Island, and about 9½ miles **N NE.** ¾ **E.** from Monhegan; it is used as a harbor of refuge by fishermen and coasters; as many as 200 vessels have been at anchor here at one time. **Marshall Point light** (see table of lights, p. 112) is on the eastern point at the southern entrance to the harbor. A bar obstructs the northern entrance; vessels of 15 feet draught have been taken over this bar at high water by local pilots, but strangers should not attempt to cross it. The village of **Port Clyde** is on the eastern shore; there are two wharves here which have from 12 to 14 feet of water at their ends at high water, but vessels lie aground at low water.

Channels.—The channel leading into Herring Gut from the eastward, between Mosquito Island and Hay Ledge, has good water with the principal dangers marked by buoys. The channel from the southward, between Gunning Rocks and Hart's Island, leads between several unmarked shoal spots; the light-house is the guide for entering by this channel. The channel from the westward through Davis Straits has its most prominent dangers buoyed, but is quite narrow to the northward of Davis Island and at the entrance to the harbor.

The anchorage is anywhere in the channel inside of Marshall Point, in 3 to 6 fathoms, good holding ground, keeping out of the bight which makes to the eastward just north of the point.

Pilots can be obtained by making signal and lying off The Brothers, but they are not necessary for entering the harbor unless bound in from the northward across the bar when a pilot should be taken off Hooper's Point; or, coming from the westward one may be taken at Franklin or Harbor islands.

Tow-boats can be had by telegraphing from Tennant Harbor, distant 4 miles, to Bath; butvess els do not require one unless disabled.

Supplies.—Anthracite coal in limited quantities and water can be had alongside the wharf. Provisions and ship chandler's stores can be obtained in the village.

Repairs.—There is one marine railway capable of hauling out vessels of 300 tons and 10 feet draught; also good facilities for repairing vessels.

Ice does not usually interfere with navigation; in very severe winters the harbor may be frozen over for a short time.

For tidal data see table, page 116.

SAILING DIRECTIONS, HERRING GUT (PORT CLYDE).

1. ***Approaching and Entering.—From the Eastward.***—Having come through Muscle Ridge Channel, steer **SW.** by **W.** ½ **W.**, or, having come through Two Bush Channel, shape the course about **W.** ½ **S.**, so as to pass about 400 yards south of the southeastern point of Mos-

† Shown on Coast and Geodetic Survey charts: 312, scale $\frac{1}{40,000}$, price $0.25; and 105, scale $\frac{1}{80,000}$, price $0.50.

quito Island; when Marshall Point light bears **W NW.** steer for it. Leave Mosquito Island 400 yards on the starboard and The Brothers at least 250 yards on the port hand. Pass to the northward of Gunning Rocks buoy (spar, black, No. 1) and change course to **W. ½ N.**, passing about 100 yards to the southward of Marshall Ledge buoy (spar, red, No. 4). Then haul to the northward, giving Marshall Point a berth of 200 to 300 yards, and steer about **N.** by **E. ½ E.**, so as to leave Hooper's Island Ledge buoy (spar, black, No. 1) about 100 yards on the port hand; anchor off the wharves at Port Clyde in from 3½ to 5 fathoms of water, soft bottom.

Remarks.—**Mosquito Island** is a large wooded island about 3 miles **SW.** from Tennant Harbor light-house. Coming from Two Bush Channel, or Muscle Ridge Channel, there are no dangers until up with Mosquito Island, which has ledges and shoals making out on every side; it should not be approached nearer than 200 yards on its eastern or southern sides, and during a heavy easterly sea it should not be approached closer than 400 yards.

In approaching from the eastward do not allow Marshall Point light to fall to the northward of **NW. by W. ½ W.** until after passing black buoy No. 1. This will clear Barter's Shoal and the shoal water off north end of The Brothers. On the **W NW.** course black buoy No. 1 should be a little on the port bow, and Mosquito Island Ledge buoy (spar, red, No. 2) should be on the starboard bow, and left about 400 yards on the starboard hand.

The **W. ½ N.** course leads about 100 yards to the southward of red buoy No. 4, and should be continued about 200 yards beyond it before the course is changed to the northward.

Dangers.—**Hay Ledge** is a small, bare, rocky island lying a little over ½ mile **SW. by W. ½ W.** from Mosquito Island; it is surrounded by shoal water and should be given a berth of 250 yards.

Barter's Shoal is an unmarked pinnacle rock, with 15 feet of water over it, lying nearly midway between Mosquito Island and Hay Ledge. It bears **SW. by W.**, distant 700 yards from the southeastern point of Mosquito Island, and the sea breaks on it in a heavy easterly gales.

The Brothers are three small rocky islands to the northwestward of Hay Ledge. They are surrounded by ledges and should not be approached closer than 200 yards on their eastern and northern sides.

Gunning Rocks have ledges with 4 feet of water over them making out 400 yards in a **NE. by N.** direction. They are marked on their northern end by a buoy (spar, black No. 1) lying about ⅝ mile **SE. by E. ½ E.** from Marshall Point light-house.

Mosquito Island Ledge has 7 feet of water over it and lies ⅝ mile **E. by S.** from Marshall Point light-house; it is marked on its southern end by a buoy (spar, red, No. 2).

Marshall Ledge, with 15 feet of water over it at its outer end, makes out in a southerly direction about 275 yards from Marshall Point. It is marked on its southern end by a buoy (red, spar, No. 4). Vessels should not pass between the buoy and Marshall Point.

A 5½-foot shoal makes out 300 yards to the eastward from Hooper's Island, nearly ⅝ mile to the northward of the light-house. It is marked on its eastern side by a buoy (spar, black, No. 1).

Unmarked rocky shoals and ledges obstruct the bight on the eastern side of Herring Gut to the northward of Marshall Point.

1 A. ***Approaching and Entering.—From the Southward.***—With the eastern end of Mosquito Island bearing to the northward of **NE. ¼ E.**, bring Marshall Point light to bear **N. ¾ W.** and head for it on that bearing. This course leads about ¼ mile to the eastward of Old Cilley Ledge buoy (can, red, No. 4) and 200 yards to the westward of Gunning Rocks; when these bear to the southward of **E.** haul to the westward and steer so as to pass 200 to 300 yards to the westward of Marshall Point, and proceed as directed in Section 1, foregoing.

Dangers.—**Old Cilley Ledge** is a dangerous ledge about ½ mile long in an **E. by S.** and **W. by N.** direction, with both ends dry at low water. It lies about 1½ miles **NE.** from Burnt Island and is marked on its eastern end by a buoy (can, red, No. 4).

Unmarked **rocky shoals** with from 12 to 18 feet of water over them lie between Old Cilley Ledge and Black Rock. They can be avoided by keeping Marshall Point light bearing to the westward of **N. ¼ W.**

Black Rock is a bare, rocky islet with shoals surrounding it and making out from 200 to 300 yards to the northward and eastward. It lies 1⅓ miles **S. ½ W.** from Marshall Point light-house. There is a detached 15-foot shoal 450 yards **NE. ¼ E.** from Black Rock. The **N. ¾ W.** course leads 600 yards to the eastward of Black Rock and 200 yards to the eastward of the 15-foot shoal; the latter can be avoided by keeping Marshall Point light bearing to the westward of **N. ¼ W.**

Gunning Rock Shoal is a 4½ foot rocky shoal lying ½ mile **E NE. ¼ E.** from Black Rock, and about ⅝ mile **S SE.** from the westernmost of the Gunning Rocks. It can be avoided by keeping Gunning Rocks open to the eastward of Marshall Point light.

An unmarked 14-foot shoal spot lies 300 yards **W.** of the southwestern end of Gunning Rocks; the **N. ¾ W.** course passes about 100 yards to the eastward of it and 200 yards to the westward of Gunning Rocks. It can be avoided by keeping Marshall Point light bearing to the westward of **N. ¼ W.**

For the remaining dangers see "Dangers" under Section 1, foregoing.

1 B. *Approaching and Entering.—From the Westward through Davis Straits.*—From a position about 2 miles S. of Pemaquid light-house steer about E NE. for Eastern Egg Rock beacon (wooden tripod, 54 feet high, upper part covered with boards). Pass about 200 yards to the northwestward of the beacon and midway between it and red buoy No. 4, then steer E NE. ⅞ E. for the northern end of Davis Island; pass about 200 yards to the northward of Seal Ledges buoy (spar, black, No. 7). Griffins Ledge buoy (spar, red, No. 8) will be sighted ahead in the middle of Davis Straits; when within 300 yards of the buoy steer nearly for it, or so as to leave it about 20 yards on the port hand, and as soon as it is passed steer NE. for ¼ mile; this will clear the ledges off the north end of Davis Island. Then steer NE. by E. ¾ E., passing about 200 yards to the northward of Gig Rock buoy (spar, red and black horizontal stripes) and 100 yards north of The Sisters buoy (spar, black, No. 5). Continue this course, passing about 100 yards north of Allen's Ledge buoy (spar, black, No. 3) and give Hooper's Island a berth of about 200 yards. When about 500 yards beyond the buoy haul to the northward and proceed as directed in Section 1, foregoing.

Remarks—On the E NE. ⅞ E. course, after leaving Eastern Egg Rock, **Old Hump Ledge**, an irregular mass of bare rocks with green patches on top, will be seen on the port bow, and black buoy No. 7, marking Seal Ledges, a little on the starboard bow. The northern end of Davis Island is bare; the islands on the northern side of the channel are covered with a straggling growth of trees. Between Griffin's Ledge buoy and Davis Island the channel is less than 100 yards wide, and it is necessary to pass close to the buoy.

On the NE. by E. ¾ E. course the red and black horizontal striped buoy marking Gig Rock will be on the star board bow and black spar-buoy No. 5, marking The Sisters, and black spar-buoy No. 3 on Allen's Ledge, at the entrance to Herring Gut, will be nearly ahead and a little on the starboard bow. The red iron spindle on Old Horse Ledge and red spar-buoy No. 6 on Hooper's Island Rocks will be on the port hand.

Dangers.—**Eastern Egg Rock** is low and bare with shoals making out about 100 yards from its northern end, which is marked by a wooden tripod. It lies 5½ miles E. from Pemaquid Point light-house and 1⅞ miles S SW. from Franklin Island light-house.

Egg Rock, North Ledge, about 250 to 300 yards to the northward of Eastern Egg Rock, is awash at low water. It is the southernmost of a series of ledges extending to Franklin Island and is marked on its southeastern end by a buoy (spar, red, No. 12).

Seal Ledges are two rocky shoals with deep water between them, lying in a NE. by N. and SW. by S. direction and separated about ¼ mile. The northern one is bare at low water and is marked on its northern end by a buoy (spar, black, No. 7) lying 2 miles E. by N. from Eastern Egg Rock beacon. The southern one has 6 feet of water on it.

Old Hump Ledge is a bare rock with ledges dry at low water, making out about 250 yards to the northeastward. It should be left from 400 to 500 yards on the port hand on the E NE. ⅞ E. course.

Griffins Ledge, with 10 feet of water on it, is midway in the narrow part of Davis Straits. It is marked on its southern side by a buoy (spar, red, No. 8), which should be left close-to on the port hand going east.

Davis Island has shoals making out about 150 yards to the northward; after passing red buoy No. 8 the course should be changed quickly to the northward so as to give Davis Island a berth of about 250 yards.

Gig Rock is a small shoal with 5 feet of water on it, lying ⅝ mile NE. by E. ¾ E. from the northern end of Davis Island; it is marked on its northwest end by a buoy (spar, red and black horizontal stripes).

The Sisters are two small rocky shoals, lying 1¼ miles SW. by W. ¾ W. from Marshall Point light-house; they are awash at low water. The westernmost is marked on its northwestern end by a buoy (spar, black, No. 5).

Old Horse Ledge, a rock awash at low water, lies 1⅝ miles W. by S. from Marshall Point light-house. It is marked by a spindle (iron, red, 30 feet high, with cage on top).

Hooper's Island Rocks is a rocky shoal with 5½ feet of water on it and covered with kelp, lying ⅞ mile W. ¾ S. from Marshall Point light-house. It is marked on its southeastern side by a buoy (spar, red, No. 6). There is a detached 16-foot shoal spot about 300 yards NE. from the buoy.

Hart's Island Bar is a ledge, a part bare at low water, making out ½ mile to the northward from **Hart's Island**—the island S SW. ½ W. from Marshall Point light-house. **Allen's Ledge**, with 2 feet of water over it, is off the northern end of the bar and is marked on its northern end by a buoy (spar, black, No. 3). The channel is north of this buoy.

Hooper's Island has shoals making out about 150 yards from its southern end; it should not be approached closer than 200 yards on its southern or southeastern side.

MONHEGAN ISLAND AND HARBOR.†

This island lies 20 miles W. by N. from Matinicus Rock, 14½ miles SW. ¼ W. from Whitehead, and 19¼ miles E. ¼ S. from Seguin. Monhegan Island is the westernmost of the islands lying off the entrance to Penobscot Bay, and is one of the important landmarks for vessels bound along the coast; it is about 1⅝ miles long in a NE. and SW. direction, is about 160 feet high at its highest point, and presents a rocky shore, with high bluffs in several places. On the high point of the island, near its middle, is **Monhegan Island Light-house** (see table of lights, p. 112), and to the westward is **Manana Island**, small and 100 feet high, on which is a fog signal station (see table of lights, page 112).

† Shown on Coast and Geodetic Survey charts: 312, 313, scale of each $\frac{1}{40,000}$, price of each $0.25; and 105, scale $\frac{1}{80,000}$, price $0.50.

Monhegan Harbor is a small anchorage, exposed to the southward, lying between Monhegan and Manana islands; it is used principally by fishermen and small vessels, and has 3 to 5½ fathoms of water, with good holding ground, but there is not room at the anchorage for a moderate sized vessel to swing. The harbor is entered from the southward; a bar and two small rocky islets obstruct the northern entrance. On the eastern side of the harbor is a small village. The nearest post office is Port Clyde; the nearest telegraphs are at Tennant Harbor and Boothbay.

Pilots—Vessels bound to Penobscot Bay and river or to Thomaston sometimes take a pilot from Monhegan, lying off and on outside the harbor with signal flying until boarded.

ST. GEORGE RIVER AND THOMASTON. †

The entrance of this river lies about 9 miles to the southwestward of Whitehead and **N NE.** from Monhegan; Marshall Point light marks the eastern, and Franklin Island light the western approach (see table of lights, p. 112). A group of islands, known as the **George Islands**, extend in a **S SW.** direction for 5 miles from the middle of the entrance which is also obstructed by numerous ledges and rocks, the most prominent of which are marked by buoys or spindles. Several channels with deep water lead into the river between these islands and ledges; strangers usually take a pilot when entering. The St. George River extends 10 miles in a northeasterly direction to the town of **Thomaston**, where the Warren River, a shallow stream of little commercial importance, empties into it from the northwestward. Herring Gut (Port Clyde) is on the eastern side of the entrance to the river (see heading).

Deep Cove, on the eastern shore just north of the northern entrance to Herring Gut, has good anchorage in 3 to 5 fathoms, soft bottom.

Gay Cove is a shallow cove in the eastern shore of **Gay Island**, the western point at entrance to the river.

Pleasant Point Gut separates Gay Island from the mainland. It is unsafe for strangers.

Turkey Cove, on the eastern shore about 1½ miles above Caldwell Island, has good anchorage in 3¼ to 5 fathoms, soft bottom, about midway between the points at entrance.

Maple Juice Cove is a long shallow cove on the west shore about 2¼ miles above Caldwell Island; good anchorage is found at the entrance, in 4 fathoms water, **SW.** from Bird Point.

Otis Cove is a broad cove, shallow at its head, about 1 mile above Maple Juice Cove on the eastern shore. The village of **St. George** is at its head.

Broad Cove is a large, shallow cove on the western shore about 4½ miles above Caldwell Island; the village of **Cushing** is situated near its western shore.

Watt's Cove and **Cutler's Cove** are two shallow coves on the eastern shore opposite Broad Cove.

The town of **Thomaston** is at the head of the St. George River. Vessels of 20 feet draught have been taken up at high water, the average draught of vessels entering here is 10 to 12 feet.

Warren River empties into the St. George River west of Thomaston; it is navigable at high water to the village of **Warren**, about 4 miles above Thomaston. There are three draw-bridges above Thomaston, with draws estimated to be 40 feet wide.

The **channel** in St. George River up to Broad Cove has 10 fathoms or more water; above this the depth gradually decreases and it narrows to a small stream through extensive flats which show bare at low water.

Anchorages.—Good anchorage for the heaviest draught vessels is found to the eastward of Caldwell Island in 6 to 8 fathoms water, soft bottom; above this vessels anchor anywhere in the channel where the depth is not too great (see Turkey Cove, Maple Juice Cove, and Otis Cove).

Pilots are generally taken by strangers bound up the river. If from the eastward, they can be had at Herring Gut by making signal when off Marshall Point, or, standing in and coming to anchor north of Caldwell Island. From the westward, vessels make signal when off Franklin Island and take a pilot either from Franklin or Harbor islands.

Tow-boats are seldom used; they may be had from Bath or Bangor by telegraph.

Supplies.—Provisions and ship chandler's stores, anthracite and bituminous coal, and water can be had at Thomaston.

Ice closes the river to navigation from December to March.

SAILING DIRECTIONS, ST. GEORGE RIVER TO AN ANCHORAGE EAST OF CALDWELL ISLAND.

Note.—Strangers coming from the eastward usually anchor in Herring Gut, or, take a pilot off Marshall Point.

1. ***Approaching and Entering.—From the Eastward.***—Follow the directions in Section 1, page 117, until Marshall Point Ledge buoy (spar, red, No. 4) bears **N.**, distant about 100 yards; then steer **W NW. ¾ W.** and leave Allen's Ledge buoy (spar, black, No. 3) about 30 yards on the port hand. Then steer **W.** by **S.**; leave Hooper's Island Rocks buoy (spar, red, No. 6)

† See foot note on page 117.

about 150 yards on the starboard hand and round the buoy at this distance; when it is in range with Marshall Point light, steer **N.** by **W.** ½ **W.** for the western end of Teal's Island, and when the northern end of Bar Island bears **W.**, distant ¼ mile, steer **NE.** about ⅞ mile and haul to the northward, leaving Channel Rock buoy (spar, red and black horizontal stripes) about 75 yards on either hand. Anchor to the northeastward or northwestward of this buoy in about 7 fathoms water, soft bottom.

Remarks.—The channel to the northward of Allen's Ledge buoy is narrow and the buoy should not be left over 75 yards on the port hand. On the **W.** by **S.** course the spindle on Old Horse Ledge will be a little on the starboard bow. Hooper's Island Rocks buoy should not be approached closer than 150 yards. On the **N.** by **W.** ½ **W.** course **Teal's Island**, about 45 feet high at its southern end and partly wooded, will be ahead. **Bar Island** is the small island to the southwestward of Teal's Island; off its northern end is a small islet surrounded by ledges which connect them. On the **NE.** course Hooper's Point will be a little on the starboard bow. Channel Rock buoy should be made on the port bow. After passing Channel Rock there are no dangers; the eastern shore should be given a berth of 300 yards.

Dangers.—Allen's Ledge and Hooper's Island Rocks are described on page 119.

Kelp Ledges extend out about 500 yards from the western shore of Hooper's Island abreast of Bar Island; a small part of this ledge, nearest Hooper's Island, is bare at low water; the rest has from 2 to 12 feet of water over it. The ledge is not marked but can be avoided by giving the western shore of Hooper's Island a berth of 600 yards until the southern end of Teal's Island bears **W.**

Murray's Ledge is small, has 16 feet over it and lies about ¼ mile **SW.** ½ **S.** from Channel Rock buoy and about 350 yards **E.** from the eastern end of the Little Caldwell Islands. There is good water on all sides of this ledge.

Channel Rock is a small detached ledge with 9 feet over it lying about 500 yards to the westward of Hooper's Point. It is marked by a buoy (spar, red and black horizontal stripes) placed on the middle of the ledge.

1 A. *Approaching and Entering.—From the Westward.*—When Franklin Island light is made, steer for it on any bearing between **NE.** by **E.** ½ **E.** and **NE.** Pass to the westward of Franklin Island, giving it a berth of 200 to 300 yards and steer **NE.** by **E.** ½ **E.** Red spar buoy No. 4, marking Jenks Ledge, will be made on the starboard bow and left about 300 yards on the starboard hand, and the red and black horizontal striped spar buoy, marking Goose Rock Ledge will be seen directly ahead. When nearly up to Goose Rock Ledge buoy haul more to the eastward and pass about 200 yards to the southward of it and midway between it and Goose Rock; then steer **NE.** by **E.** ¾ **E.**; round the northern end of Caldwell Island, giving it a berth of 200 to 300 yards, and leave Gay Cove Ledge buoy 150 yards on the port hand. Anchor anywhere to the eastward of the island in from 6 to 10 fathoms, good holding ground.

Remarks.—Standing for Franklin Island light, Eastern Egg Rock and beacon, and red spar-buoy No. 12, marking Egg Rock, North Ledge should be made on the starboard bow and left at least ⅝ mile on the starboard hand. New Harbor Sunken Ledges buoy (spar, red, No. 14) will be made on the port bow, and left not nearer than ⅝ mile on the port hand. **Western Egg Rock**, a bare rocky island, with patches of grass on top, will also be seen on the port bow, and the red spar-buoy, No. 2, marking the shoal to the eastward of the rock, should be left not closer than ¼ mile on the port hand. **Franklin Island** is comparatively bold-to, and may be approached to about 150 yards.

Beyond Franklin Island **Gangway Ledge**, a small, bare rock, will be seen on the starboard bow and left about ¼ mile on the starboard hand. Otter Island, well wooded and about 40 feet high on its southern end, will be on the port bow and left about ½ mile on the port hand. Caldwell Island is comparatively bold-to on its western and northern sides, and may be approached to about 150 yards.

Dangers.—**Moser's Ledge** is an unmarked 17-foot rock lying 3¾ miles **SE.** ¾ **E.** from Pemaquid Point light-house. It can be avoided by keeping Franklin Island light bearing to the eastward of **NE.** ½ **N.**

New Harbor Sunken Ledges are a number of dangerous ledges, with 4 to 15 feet of water on them, extending about ¼ mile in a general **NE.** by **N.** and **SW.** by **S.** direction. They lie about 3 miles **E NE.** ¾ **E.** from Pemaquid Point light-house, and are marked on their southern end by a buoy (nun, red, No. 14).

Egg Rock South Ledge, Eastern Egg Rock, Egg Rock North Ledge, Midway Rock, Hough's Ledge, and Round Ledge are a series of rocky ledges and shoals extending in a general **S SW.** direction for 2¼ miles from Franklin Island. They are nearly all unmarked, but may be avoided by keeping Franklin Island light bearing to the eastward of **N NE.** ¾ **E.**

Gangway Ledge is a small, bare rock with shoals extending about 75 yards from it. It lies ⅞ mile **E NE.** ½ **E.** from Franklin Island light-house.

Otter Island Ledge, with 8 feet of water on it, lies about 400 yards to the eastward of Otter Island, with deep water between it and the ledge.

Byer's Ship Ledge, a part of which is bare at high water, extends about ⅝ mile in a general east and northeast direction from the northern end of Otter Island.

Jenks Ledge, showing bare at low water, is marked on its northern side by a buoy (spar, red, No. 4) lying 3 miles **NE.** by **E.** ½ **E.** from Franklin Island light-house.

Goose Rock Ledge, with 6 feet of water on it, lies about ½ mile **S SE.** from the southern end of Gay Island, and ¼ mile **N NW.** ½ **W.** from Goose Rock. It is marked on its southern side by a buoy (spar, red and black horizontal stripes). There is good water on both sides of the ledge, but the best passage is between it and Goose Rock.

Goose Rock is bare, and surrounded by ledges extending out about 150 yards on all sides. It lies about ⅞ mile **W. ½ N.** from the southern end of Caldwell Island.

Gay Cove Ledge, with 6 feet of water on it, is marked on its eastern side by a buoy (spar, black, No. 1) lying about 600 yards **NW.** by **N.** from the northern end of Caldwell Island. There is good water to the westward of this buoy, by giving it a berth of over 200 yards, but to the northeastward of the ledge, shoals make off 350 yards from Gay Island.

MUSCONGUS BAY.†

This bay is about 12 miles to the westward of Whitehead, and lies between the George Islands on the east and Pemaquid Neck on the west; it is obstructed by numerous islands and ledges; many of the latter are marked by buoys. Muscongus Bay and the adjacent waters are seldom used by vessels seeking shelter in heavy weather. Tennant Harbor and Herring Gut to the eastward, and Boothbay Harbor to the westward, are much easier of access, and afford better anchorage. Monhegan light is south of Muscongus Bay, and is the off-shore guide to it. **Franklin Island light** (see table of lights, p. 112) is in the midlde of the bay, and a guide for vessels entering. **Pemaquid light** (see table of lights, p. 112) is on the western point at entrance. Vessels bound to Herring Gut (Port Clyde) or St. George River from the westward usually pass through the bay, the former passing north of Eastern Egg Rock and through Davis Straits, and the latter north of Franklin Island. Strangers navigating these waters generally take a pilot, and if bound up the Meduncook or Medomak rivers should always take one, on account of the numerous unmarked dangers and strong devious tidal currents.

Meduncook River makes in to the northeastward at the northeastern end of the bay; the entrance lies to the westward of Gay Island, which separates it from the entrance to St. George's River. It is of no commercial importance, but there is a good anchorage inside of Gay Island in 3 to 5½ fathoms of water, which is seldom used except by those well acquainted with the locality. The channel above the anchorage is narrow, crooked, and full of dangers, which are not buoyed. **Davis Cove** makes into the northeastward of the anchorage.

New Harbor is a small, narrow cove on the western shore of Muscongus Bay, about 2½ miles to the northeastward of Pemaquid Point; it is used by fishermen, and has a very limited anchorage; although open to the eastward it is well sheltered from the sea. Strangers should not attempt to enter without a pilot. Ice seldom forms in the harbor, but it is sometimes closed by drift ice from the bay.

Friendship Harbor, Medomak River, and Muscongus Sound are described under their several headings.

Pilots for these waters can be found in Tennant Harbor or Herring Gut if coming from the eastward, and in Boothbay Harbor or New Harbor if coming from the westward.

Tides.—The mean rise and fall of tides in the bay is about 9½ feet.

SAILING DIRECTIONS THROUGH DAVIS STRAITS FROM THE EASTWARD.

The least water, about 4 fathoms, will be found south of Marshall Point light. The flood tide has a tendency to set a vessel to the northward and the ebb to the southward on the sailing lines to the westward of Herring Gut.

1. Follow the directions in Section 1, page 117, and when Marshall Ledge buoy (spar, red, No. 4) bears **N.**, distant 100 yards, steer about **W NW. ¾ W.** and pass about 30 yards north of Allen's Ledge buoy (spar, black, No. 3). When this buoy is abaft the beam steer **SW. by W. ¾ W.**, heading for the opening north of Davis Island. Hooper's Island Rocks buoy (spar, red, No. 6) and Old Horse Ledge spindle (iron, red, with cage on top) should be left on the starboard hand, and The Sisters buoy (spar, black, No. 5) and Gig Rock buoy (spar, red and black horizontal stripes) should be left on the port hand. Griffins Ledge buoy (spar, red, No. 8) should be made ahead. Pass about 200 yards north of Davis Island and then haul more to the southward and leave red spar-buoy No. 8 about 20 yards on the starboard hand. When about 200 yards to the southwestward of this buoy steer **W SW. ⅞ W.**, heading so as to pass to the northward of Eastern Egg Rock beacon. Seal Ledges buoy (spar, black, No. 7) should be left on the port hand. Old Hump Ledge will be left on the starboard hand. Pass about 175 yards north of Eastern Egg Rock beacon, leaving Egg Rock, North Ledge buoy (spar, red, No. 12) about 50 yards on the starboard hand. Then—

If bound to Friendship, or into the Medomak River.—Follow the directions in Section 1, page 123, or Section 1, page 124.

If bound to Muscongus Sound.—Follow the directions in Section 1, page 125.

If bound to the Damariscotta River or to Boothbay Harbor.—Continue the **W SW. ⅞ W.** course and pass about 1 mile south of Pemaquid Point. Leave Pemaquid Ledge buoy (can, red and black

† Shown on Coast and Geodetic Survey charts: 313, scale $\frac{1}{40,000}$, price $0.25; and 105, scale $\frac{1}{80,000}$, price $0.50.

horizontal stripes) ¼ mile on the starboard hand, and when Ram Island light bears **W. ½ N.**, follow the directions in Section 1, "Sailing Directions, Damariscotta River," or Section 1, "Sailing Directions, Boothbay Harbor."

Remarks.—For a description of dangers, see "Remarks" and "Dangers" under Section 1 B, page 119.

FRIENDSHIP HARBOR

lies west of Meduncook River, and is separated from it by Friendship and Garrison islands, between which a channel leads from the anchorage in Meduncook River into the harbor. This harbor extends in an **E NE.** and **W SW.** direction about 1 mile, and has good anchorage in 3¼ to 5 fathoms of water; it is little used except by local fishermen or vessels loading ice or granite. Strangers generally take a pilot. The town of **Friendship** is on the north shore of the harbor; the usual draught of vessels loading here is 10 feet; the wharves at the town are dry, but some of the ice wharves have 10 feet alongside at low water. Ice closes the harbor proper from December to March, but it does not extend to the ice wharves, except in very severe winters.

Hatchet Cove is a shallow cove making in to the northward at the western end of Friendship Harbor. A narrow channel, with a least depth of 15 feet, leads to the northeastward into the cove near its western point at entrance. It is of no importance as an anchorage.

SAILING DIRECTIONS, FRIENDSHIP HARBOR. †

Coming from the eastward the route most generally followed is through Herring Gut, across the entrance to St. George River and through the passage, to the northeastward of Friendship Island, joining Meduncook River with Friendship Harbor. This route is so narrow in places, and obstructed by unmarked dangers, that a pilot is necessary; strangers not wishing to take one can avoid doing so by following the sailing directions given in Section 1, following.

1. *From the Eastward.*—Follow the "Sailing Directions, Herring Gut," Section 1 or 1 A, pages 117, 118, until off the entrance to Herring Gut; then follow the sailing directions given in Section 1, page 122, and when about 400 yards to the westward of the beacon on Eastern Egg Rock, steer **N. ¼ E.** for the eastern end of Wreck Island. When ½ to ¼ mile from the island, and the south end of Harbor Island bears about **SE.** by **E.**, steer **NE. ½ N.**; leave Wreck Island from 300 to 600 yards on the port hand, and pass about midway between Black Island and Jones' Garden Island, leaving Garden Island South Ledge buoy well on the port hand. When Gull Rock, small and bare, bears **W NW.**, distant about ⅜ mile, change course to **E NE. ¼ E.**, keeping about midway between the north and south shores of Friendship Harbor. Anchor in 3 to 5 fathoms water to the southward and eastward of Jameson's Point.

Remarks.—The remarks and dangers up to Eastern Egg Rock are given under Sections 1, 1 A, and 1 B, "Sailing Directions, Herring Gut," pages 117–119.

On the **N. ¼ E.** course **Wreck Island**—about 25 feet high and well wooded with pine and oak, lying 1½ miles **NW.** by **N.** from Franklin Island light-house—will be ahead, and **Crane** and **Harbor islands**, low with scattered trees, will be on the starboard bow and be left on the starboard hand.

On the **NE. ½ N.** course **Black Island**, about 30 feet high, and wooded with a growth of stunted spruce, will be on the starboard bow, and left about ¼ mile on the starboard hand. **Wreck Island Ledges**, two bare, rocky islets to the northeastward of Wreck Island, and **Jones Garden Island**, bare, rocky isle, will all be on the port bow and left ¼ to ⅜ mile on the port hand. The large ice-house on the western shore of Hatchet Cove should be a little on the star board bow, and **Gull Rock**, a small, bare, rocky islet on the port bow.

Dangers.—**Devil's Back**, a detached rock bare at three-quarters ebb, lies 1¼ miles **NW.** by **W. ¾ W.** from Franklin Island light-house. The **N. ¼ E.** course leads about ⅜ mile to the eastward of this danger.

Harbor Island Rock, with 10 feet of water on it, is a dangerous, unmarked ledge, lying midway between the southern end of Harbor Island and Wreck Island, and ⅜ mile **SW.** by **W. ½ W.** from the extreme western end of Harbor Island.

Wreck Island Ledges are two bare islets surrounded by shoals, extending about ¼ mile in a **NE.** and **SW.** direction, about ¼ mile **N.** of Wreck Island; they may be approached to about 150 yards.

Garden Island South Ledge, with 2 feet of water on it, makes out 400 yards **SW.** by **S.** from Jones Garden Island It is marked on its southern end by a buoy (spar, red, No. 2).

Jones Garden Island has shoals making out 250 yards to the northeastward from it, and should not be approached. closer than 300 yards on its northern or eastern side.

An unmarked 12-foot shoal makes out ¼ mile in a **N NW.** direction from the southwestern end of Cranberry Island. It can be avoided by keeping the southwestern end of Friendship Island bearing to the eastward of **NE.** when within ¼ mile of it.

† See foot note on page 122.

1 A. *From the Southward or Westward.*—When Franklin Island light is made, steer for it on any bearing between NE. by E. ½ E. and NE., and when about 1 mile distant from the light, and the eastern side of Wreck Island bears N. ¼ E., steer for the latter on that bearing, and follow the directions given in Section 1, foregoing.

Remarks.—For remarks and dangers, when standing for Franklin Island light, see "Remarks" and "Dangers" under "Sailing Directions, St. George River," pages 121–122; for the others, see "Remarks" and "Dangers," Section 1, foregoing. There is a passage leading between Western Egg Rock and Haddock Island, and Jones Garden Island and Thief Island, but it is so obstructed by unmarked dangers that strangers are advised not to attempt it.

MEDOMAK RIVER †

makes in to the northward west of **Martin's Point**, the western point at the entrance to Friendship Harbor. The lower part of the river is about 2 miles wide, but is separated by several islands into two approaches, which have three narrow and crooked channels, by which the river proper is entered. The approaches to these channels are through Muscongus Bay or Muscongus Sound. Strangers wishing to enter the river should take a pilot, on account of the many unmarked dangers and the strong tidal currents which require local knowledge. The eastern entrance between Martin's Point on the east and Bremen Long Island on the west is about ⅝ mile wide at its southern end; 1¾ miles above Martin's Point Hungry Island divides this entrance into two narrow passages; the eastern leads through **Back River Cove**; the western, on the western side of Hungry Island, is called the **Flying Passage**. Both have good water, but are very narrow in places, with strong tidal currents. The western entrance is between Bremen Long Island on the east and Hockomock Point on the west, and is called **Hockomock Channel**. It has a least depth of 4½ fathoms, but is narrow in places and has strong tidal currents. Above Bremen Long Island the Flying Passage and Hockomock Channel unite, and to the northwestward a narrow channel leads into a large shallow cove called Broad Cove; the village of **Broad Cove** is on its western shore. Making in to the northward from Broad Cove is **Eastern Branch**, a shallow arm with a narrow channel extending 1 mile above Johnson's Island.

About 1 mile above Bremen Long Island the channel is obstructed by a chain of islands and ledges extending from the northern part of Jones' Neck to Dutch Neck; the channel at this point is known as **The Narrows**; it is about 45 yards wide, and marked by a buoy on either hand. Above The Narrows the river widens and the channel has a winding course for about 5 miles to the town of **Waldoboro**, at the head of navigation, with a least depth of 1 foot at low water about ½ mile below the town. It is staked out with poles from Hollis' Point to Waldoboro during the summer. **Pitcher's Cove, Long Cove**, and **Sampson's Cove** are three shallow coves in the eastern shore of the river, from 1 to 2 miles above The Narrows.

Waldoboro is on the line of the Knox & Lincoln R. R. The usual draught of vessels entering is about 12 feet; there is 3 feet at low water alongside of the wharves; 12 feet can be taken up at low water to within 3 miles of the town. Fresh water is taken from the river just above the wharves; provisions and ship-chandler's stores can be obtained in the town. Ice closes the river to navigation from December to April.

Repairs.—Ordinary repairs to vessels can be made at the shipyards at Waldoboro; there are no docks or marine railways.

SAILING DIRECTIONS, MEDOMAK RIVER.

1. *Approaching, and to the entrance.—From the Eastward.*—Having come from Herring Gut, and followed the directions in Section 1, page 122, when about 400 yards to the westward of Eastern Egg Rock beacon, steer N. ¼ E. for the eastern end of Wreck Island. When the island is about ¼ mile distant ahead, and the south end of Harbor Island bears about SE. by E., steer NE. ½ N. about 1¾ miles, when Jones Garden Island should bear about W NW., distant ¼ mile. From this position steer N. by E. ¾ E. for the entrance of the river, leaving Gull Rock a little over ¼ mile on the starboard hand. Anchor to the southward and westward of Hungry Island, about 1¾ miles above Gull Rock. If desiring to enter the river, or if bound to Waldoboro, take a pilot.

Or, being about 1¾ miles south of Allen's Island, and about 3 miles to the northward of Monhegan, steer NW. by W. ½ W., passing at least ½ mile south of Shark Island. When Franklin Island light bears to the eastward of NE. by N., steer for it, and when it is about 1 mile distant ahead, the eastern end of Wreck Island should bear N. ¼ E.; then steer for the island on this bearing, and follow the directions in the preceding paragraph.

Remarks.—See the remarks under Sections 1 and 1 B, "Sailing Directions, Herring Gut." **Shark Island** is a low, rocky islet with ledges extending about ¼ mile to the northwestward from it, and lies about 1¾ miles W. by S. from the southern end of Allen's Island. When heading for Franklin Island light, course about NE., **Wreck Island**, a small wooded island about 1¼ miles NW. by N. from the light, will be seen broad off the port bow. The N. ¼ E. course for the eastern end of Wreck Island leads to the westward of **Crane** and **Harbor islands**, the latter being the northern-

† See foot note on page 122.

most and larger, and separated from Crane Island by a narrow channel. On the **NE. ½ N.** course **Jones Garden Island**, small, low, bare, rocky islet surrounded by ledges, and the red spar-buoy to the southwestward of the island will be on the port bow, and should be left ¼ mile on the port hand.

The **N. by E. ¾ E.** course leads up the middle of the entrance to the river, and Hungry Island will be ahead. All dangers above Gull Rock will be avoided by giving the shores a berth of 400 yards when on this course, and coming to anchor a little over toward the western shore below Hungry Island.

Dangers.—**Old Man Ledge**, marked by a spindle, and a buoy (can, red, No. 6), lies nearly 1 mile **S.** from the southern end of Allen's Island. Vessels should pass to the southward of the buoy.

Detached sunken rocks and unmarked ledges extend 3 miles to the westward from Allen's Island; Shark Island is the southernmost of them.

Western Egg Rock Breakers have 4 feet of water over them and lie 1⅝ miles **W. by S.** from Franklin Island lighthouse and nearly 700 yards to the eastward of Western Egg Rock. It is marked by a buoy (spar, red, No. 2) which should be left on the port hand by vessels standing for Friendship Harbor or Medomak River from the southward or westward.

Devil's Back, Harbor Island Rock, Wreck Island Ledges, and **Garden Island Ledge** are described under Section 1, page 123.

Gull Rock is a small, bare, rocky islet lying 1¾ miles **NE. ¾ N.** from Jones' Garden Island, and about ½ mile **SW. ¾ S.** from **Martin's Point**, the eastern point of the approach to Medomak River. It should be given a berth of at least 225 yards.

1 A. ***Approaching and to the entrance.—From the Westward.***—Follow the directions in Section 1 A, page 123, and when the eastern end of Wreck Island bears **N. ¼ E.** steer for it on that bearing and follow the directions in Section 1, preceding.

For Remarks and Dangers see Section 1 A, page 121, and Section 1, preceding.

MUSCONGUS SOUND †

is on the western side of Muscongus Bay, between Muscongus and Hog islands on the east and the mainland on the west; it is about ⅝ of a mile wide and 5 miles long in a **NNE.** and **SSW.** direction, and has several rocks and ledges near its southern entrance, the most prominent of which are marked by buoys. North of Hog Island a narrow channel called **Lower Narrows** forms one of the approaches to Hockomock Channel and Medomak River. Many of the vessels bound up the Medomak River pass through Muscongus Sound; strangers should take a pilot either at New Harbor or at Round Pond.

Marsh Harbor is on the southeastern side of Muscongus Island, between it and Marsh Island; it is not an anchorage.

Round Pond is a land-locked little harbor with 12 to 18 feet of water in its middle, on the west shore of Muscongus Sound, about 2 miles above the southern end of Muscongus Island; it affords good anchorage for small vessels, but is little used. There is a granite quarry and wharf on the north side of the entrance at which vessels load granite, and **Round Pond**, a small village, is at the head of the harbor.

Muscongus Bar is the shoal between the north end of Muscongus Island and the south end of Hog Island; it has 5 feet at low water, but strangers should avoid it.

Muscongus Harbor is a small cove and village on the west shore of the sound about 1½ miles above Round Pond.

Greenland Cove is the extreme northern end of the sound; it is shallow and of no importance.

SAILING DIRECTIONS, MUSCONGUS SOUND TO AN ANCHORAGE IN ROUND POND HARBOR.

1. ***From the Eastward.***—Follow the "Sailing Directions, Herring Gut," Section 1 or 1 A, page 117, until off the entrance to Herring Gut, then follow the sailing directions in Section 1, page 122, and when Eastern Egg Rock beacon bears **S.** steer **NW. by W. ¼ W.** Pass to the southward of Haddock Kelp Ledge buoy (spar, red and black horizontal stripes), and when it bears **NE.**, or Pemaquid light bears **SW. by W. ¾ W.**, steer **N NW.** Pass about 300 yards to the southwestward of Webber's Sunken Ledge buoy (spar, red, No. 2), and when about 400 yards from the western shore steer **NE. by N.**, giving Browns Head a berth of about 300 yards. Pass about 100 to 200 yards to the eastward of Poland's South Ledge buoy (spar, black, No. 1) and steer **N. ½ E.**, giving Poland's North Ledge buoy (spar, black, No. 3) a berth of about 300 yards. When the harbor is opened, pass close to the northward of Harbor Ledge buoy (spar, black, No. 5) on a **W.** course and stand into Round Pond Harbor, keeping about midway between the shores at its entrance; anchor in the middle of the harbor in 12 to 18 feet of water.

If bound in to Medomak River take a pilot off the entrance to Round Pond Harbor.

Remarks.—Approaching Eastern Egg Rock, see "Remarks" and "Dangers" under Sections 1, 1 A, and 1 B, "Sailing Directions, Herring Gut," page 117. On the **NW. by W. ¼ W.** course, after leaving Eastern Egg Rock, **Western Egg Rock**, a bare, rocky isle, and the red spar-buoy marking the breakers to the eastward of it will be made on the starboard

† See foot note on page 122.

bow; the rock should be left about ⅝ mile on the starboard hand. The horizontal striped buoy marking Haddock Island Kelp Ledge will be seen a little on the starboard bow, and left about 200 yards on the starboard hand. The large red nun-buoy marking the southern end of New Harbor Sunken Ledges will be broad off the port bow and left about 1¼ miles on the port hand.

On the **N NW.** course **Haddock Island**, low and rocky, covered with a stunted growth of spruce, will be on the starboard bow and left about ⅝ mile on the starboard hand. Red spar-buoy No. 2, marking Webber's Sunken Ledge, will be left about 300 yards on the starboard hand. The high hill back of Brown's Head will show prominently a little on the starboard bow. **Browns Head** is rocky, with a broken gap showing to the southeastward.

On the **NE.** by **N.** course up Muscongus Sound, red spar-buoy No. 4, marking Bar Island Ledge, will show on the starboard bow and be left about ⅝ mile on the starboard hand. From ¼ mile to the northward of Bar Island Ledge buoy to the Poland's Ledges there are no dangers; the eastern shore of the sound may be approached to 250 yards, except opposite the entrance to Round Pond, where shoals make out about ¼ mile from the shore. The western shore is bold-to and may be approached to 100 yards.

Dangers.—**Western Egg Rock** has a ledge making out about 400 yards in a southwesterly direction from its southern end.

New Harbor Sunken Ledges are described on page 121. The north end of the ledge is left at least ⅓ mile on the port hand when on the **NW.** by **W.** ¼ **W.** course.

Haddock Island Kelp Ledge, with 8 feet of water on it, lies ⅞ mile **W.** by **N.** from the southern end of Western Egg Rock; it is marked on its southern end by a buoy (spar, red and black horizontal stripes).

Webber's Sunken Ledge, with 7 feet of water on it, lies about ⅝ mile **NW.** ½ **N.** from the southern end of Haddock Island; it is marked on its southern end by a buoy (spar, red, No. 2).

Webber's Dry Ledge, bare at low water; **Browns Head Ledge**, with 13 feet of water on it; **Webber's North Ledge**, with 14 feet of water on it, and **Bar Island Rock**, with 11 feet of water on it, are unmarked dangers lying in the entrance to Muscongus Sound. They can be avoided by keeping within 500 yards of the western shore until opposite Bar Island.

Bar Island Ledge, with a rock bare at low water, is about ¼ mile long in a general **N NE.** and **S SW.** direction and lies 600 yards **W NW.** ¼ **W.** from **Bar Island**, the small island south of and close to Muscongus Island; it is marked on its southern end by a buoy (spar, red, No. 4).

Poland's South Ledge, with 9 feet of water on it, is marked on its eastern side by a buoy (spar, black, No. 1) lying near the middle of the sound and 1 mile north of the southern end of Muscongus Island. The best water is to the eastward, but there is a passage with good water to the westward; the ledge can be avoided when on that side by keeping within 250 yards of the western shore.

Poland's North Ledge, bare at low water, makes out 300 yards from the western shore and lies about ⅝ mile **S.** of the southeastern point at entrance to Round Pond Harbor. There is no safe passage, for a stranger, between this ledge and the shore. It is marked on its southern end by a buoy (spar, black, No. 3).

Harbor Ledge extends 300 yards in a **N.** by **E.** direction from the southeastern point at entrance to Round Pond Harbor. It is marked on its northern end by a buoy (spar, black, No. 5) placed in 17 feet water. The channel leads close to the northward of this buoy; there is an 18-foot spot about 100 yards to the northeastward of it.

1 A. ***From the Southward or Westward.***—After passing Pemaquid Point light follow the western shore on a general **NE.** by **N.** course, keeping about ¾ mile from Pemaquid Neck until abreast Long Cove, when haul in to about 500 yards of the western shore; steer **NE.** by **N.** and follow the directions in Section 1, foregoing.

Remarks.—Approaching Pemaquid Neck the large red can-buoy marking New Harbor Sunken Ledges will be made on the starboard bow and left well on the starboard hand. Standing along Pemaquid Neck, **New Harbor Dry Ledge**, two little islets about ½ mile south of New Harbor, and **Little Island**, about ¼ mile south of New Harbor, will be made on the port bow and left ¼ to ½ mile on the port hand. Above Little Island, New Harbor, marked by red spar-buoy and spindle will be opened out. About ½ mile to the northward of New Harbor, **Long Cove** makes in a **N NE.** direction into Pemaquid Neck. The western shore from Long Cove to Round Pond is bold-to and may be approached to about 100 yards except for a short distance west of Poland's North Ledge. It is safer for a stranger to pass to the eastward of the Poland's ledges.

Dangers.—**Moser's Ledge** is an unmarked 17-foot rock lying 3¾ miles **SE.** ¾ **E.** from Pemaquid Point light-house. It can be avoided by keeping Franklin Island light bearing to the eastward of **NE.** ¼ **N.**

New Harbor Sunken Ledges are described on page 121.

Pumpkin Cove Ledge, with 3¼ fathoms on it, lies 1 mile **NE.** by **E.** ¾ **E.** from Pemaquid Point light-house and about ½ mile from the shore. The sea breaks on it in heavy weather.

New Harbor Dry Ledges, with a bare islet at each end, is about ¼ mile long in a **N NE.** and **S SW.** direction, about ⅝ mile from the western shore and 1¾ miles to the northward of Pemaquid Point light-house. There is no safe passage between these ledges and the western shore.

Little Island, a bare ledge, lies about 200 yards from the western shore, about ¼ mile south of New Harbor. It is the center of a sunken ledge which is about ¼ mile long in a general **NE.** by **N.** and **SW.** by **S.** direction. There is a narrow passage about midway between the island and mainland.

Salt Pond Ledge, a rock with 13 feet of water on it, lies off the northern side of the entrance to New Harbor and ⅝ mile **E.** by **N.** from the red spar-buoy, No. 2, marking the entrance.

The remaining dangers at the entrance and in Muscongus Sound are described under Section 1, foregoing.

JOHNS BAY.†

This bay lies just to the westward of Pemaquid Neck, between it and Rutherford's Island. It is about 1¼ miles wide at its entrance and 2 miles long to Johns Island, above which the Pemaquid River empties into its northeastern end, and Johns River into its northwestern. The bay is free from dangers, and has deep water up to Johns Island, above which there are several ledges and rocks on the western side of the entrance to Johns River, and also off the entrance to Pemaquid River.

These waters are of no commercial importance, and are only used as an anchorage by fishermen and those well acquainted with the locality; the holding ground is poor, except in a few places near the head of the bay and in the coves.

Pemaquid Harbor is at the entrance to Pemaquid River, to the northeastward of Johns Island; it is entered by several narrow channels between islands and rocks. **Pemaquid River** extends to the northeastward about 2 miles to the village of **Pemaquid Falls.** The river is dry at low water near its head, and has a narrow and very crooked channel. Only small vessels, well acquainted with the locality, enter Pemaquid Harbor and River.

McFarling's Cove is in the northwestern side of the bay near the entrance of Johns River; a steep hill about 150 feet high is on the western shore of the cove. **Johns River** extends to the northward about 2 miles above McFarling's Cove, and separates into two branches, the eastern, **Foster's Cove**; the western, **Western Branch. Robinson's Cove** makes into the western shore of Johns River, about 1 mile above the entrance. A stranger should not attempt to enter these waters for an anchorage. Herring Gut, to the eastward, and Boothbay Harbor, to the westward, are preferable at all times.

DAMARISCOTTA RIVER.†

The entrance to this river is about 3 miles to the westward of Pemaquid Point and 1 mile to the northeastward from Ram Island; it bears **NW.** by **W.** ¼ **W.**, distant 11¼ miles from Monhegan Island. Ram Island light is a guide to the entrance. From its mouth the river trends in a general **N NE.** direction for 14 miles to the towns of Damariscotta and Newcastle, at the head of navigation. It is navigable to these towns for vessels of 18 feet draught at high water, but the tidal currents are strong, and, although some of the dangers are marked by buoys, strangers should not pass above East Boothbay without a pilot.

The channel of the river is crooked, and in many places, owing to islands and ledges, very narrow; for a distance of 11 miles above the mouth of the river the least depth in the channel is 5 fathoms; above this the water shoals gradually to 9 feet at low water, just below the town of Damariscotta.

Inner Heron Island, on the eastern side of the main entrance, is ½ mile long in a **N.** and **S.** direction, and 300 yards wide. It has ledges extending to the southward and southwestward from it. There are several large summer houses on it and a landing at its northern end.

Christmas Cove is a small cove on the eastern side of the entrance, lying about ⅝ mile **N NE.** from the northern end of Inner Heron Island. It has a good anchorage for small vessels in 9 to 19 feet of water, but it is seldom used except by local vessels and fishermen. The village of **South Bristol** is on its western shore.

East Boothbay is a village on the west bank of the river, about 3 miles above its mouth; vessels bound up the river and waiting for a favorable wind or tide usually anchor here, and strangers take a pilot if one has not been taken off the entrance.

The **Narrows**, about 1⅝ miles above East Boothbay, is formed by Fort Island, which lies in the middle of, and contracts the channel to a width of about 150 yards.

Clarks Cove is in the eastern shore of the river where it makes an abrupt bend to the westward about 2¼ miles above the Narrows.

Pleasant Cove is on the western shore of the river opposite Clarks Cove, and makes in nearly 1½ miles to the southwestward; there is good anchorage in the mouth of this cove just to the westward of Carlisle Point, in 2½ to 5 fathoms, soft bottom.

Damariscotta on the east bank, and **Newcastle** on the west bank of the river, 14 miles from its mouth, are connected by a bridge; they are on the line of the Knox and Lincoln Railroad. Vessels of 18 feet draught can go to the wharves at either place at high water; the usual draught of vessels loading here is 10 feet; there is 8 to 10 feet of water alongside the wharves.

Anchorages.—Christmas Cove affords anchorage in 30 feet water, but is not much used, vessels bound into the river usually going as far as East Boothbay, where good anchorage is found about 200 yards from the west shore in 20 to 40 feet water. Meadow Cove, just above East Boothbay, on the west bank, has good anchorage in 20 to 40 feet water, keeping 150 yards from the shore; this is as far as a stranger should attempt to go without a pilot. Above Pleasant Cove vessels can anchor anywhere in the channel where the bottom and depth of water are suitable.

Pilots can be found at Boothbay and at East Boothbay. A stranger should take a pilot on account of the tidal currents which are strong; it requires some local knowledge to pass through and above the Narrows.

† See foot note, page 122.

Tow-boats.—Large vessels generally take a tow-boat, telegraphing to Bath for one while anchored in Boothbay or in the river. The vessels ordinarily loading here sail up the river with a favorable wind and tide.

Supplies.—Provisions and ship chandler's stores can be found at East Boothbay, Damariscotta and Newcastle. Water can be had at East Boothbay.

Ice closes the river for a distance of 8 miles below Damariscotta during January, February, and March.

Currents.—The tidal currents are strong; the ebb lasts about two hours after low water in the upper part of the river and is usually stronger than the flood. The currents follow the general direction of the channel.

Tides.—It is high water at Newcastle about 30 minutes later than at the mouth of the river. See also table on page 116.

SAILING DIRECTIONS, DAMARISCOTTA RIVER—TO AN ANCHORAGE OFF EAST BOOTHBAY.

1. ***Approaching and Entering.—From the Eastward.***—From a position ½ mile **S.** from Old Man Ledge spindle, steer **W.** ½ **N.** Ram Island light will be made ahead.

From a position ½ mile **N.** from Monhegan Island or the whistling-buoy, steer **W NW.** until Ram Island light bears **W.** ½ **N.**

From a position ½ mile **S.** from Monhegan Island, steer **NW.** ¾ **W.** until Ram Island light bears **W.** ½ **N.**

When Ram Island light bears **W.** ½ **N.**, steer for it until it is distant about 2¼ miles and Pemaquid Point light bears **NE.** by **E.** ¾ **E.** Then change course to **NW.** ¼ **W.** and pass about 400 yards to the southwestward of Inner Heron Ledge buoy (spar, red, No. 2); when Ram Island light bears **SW.** by **W.** ½ **W.** and Inner Heron Ledge buoy is abaft the starboard beam, change course to **N.** by **E.** ¾ **E.**, and head midway between Rutherford's Island and Linekin's Neck. Pass to the westward of East Shore buoy (red, spar, No. 6); give Farnum's Point a berth of 300 yards, and when it is abeam change course to **N.** by **W.** ¼ **W.**, keeping about the middle of the river; when off East Boothbay anchor in from 4 to 10 fathoms of water; or, stand on about ⅝ mile farther until above Montgomery's Point, and anchor on the western side of the channel off Meadow Cove, in 5 fathoms water.

Remarks.—Passing 3½ miles to the northward of Monhegan Island, Old Man Ledge, marked by a red iron spindle and red can-buoy No. 6, will be made and left on the starboard hand. Duck Rocks black whistling-buoy and black beacon (wooden tripod), and Sunken Duck Rocks black spar-buoy, all to the northward of Monhegan Island, will be left on the port hand when passing ½ mile north of the island on the **W NW.** course. The Georges Islands and other islands and ledges at the mouth of Muscongus Bay will be left on the starboard hand.

On the **W.** ½ **N.** course Pemaquid Ledge buoy (spar, red and black horizontal stripes) will be made a little on the starboard bow, and the black bell-buoy, marking the northern end of the **Hypocrites**, will be open a little to the southward of Ram Island light. The eastern shore of Linekin's Neck north of Little River is comparatively bold-to and may be approached anywhere to 200 yards.

Dangers.—**Old Man Ledge** is awash at low water and marked by a spindle (iron, red, 40 feet high, with wheel and pendants on top) lying ⅞ mile **S.** from the southern end of Allen's Island, and 3⅛ miles **SE.** ¾ **E.** from Eastern Egg Rock beacon. It is also marked by a buoy (red, can, No. 6) placed just to the southward of the ledge and 200 yards **S SW.** from the spindle. Strangers should not attempt to pass between this ledge and Allen's Island, as the passage is partly obstructed by dangerous unmarked ledges.

The **Duck Rocks**, two bare ledges, and **Sunken Duck Rock**, with 6 feet of water on it, are marked, the former by a black beacon and black whistling-buoy lying from ⅞ to 1⅛ miles **N NW.** ¼ **W.** from Monhegan Island light-house, and the latter by a black spar-buoy lying 1 mile **N.** by **W.** ¼ **W.** from Monhegan Island light-house. There is a passage nearly ½ mile wide with good water between these dangers and Monhegan Island and **Eastern Duck Rock Island**, a small bare island about ¼ mile to the northward of Monhegan Island.

Moser's Ledge, lying 3¾ miles **SE.** ¾ **E.** from Pemaquid Point light-house, is described on page 126.

Pemaquid Ledge, a small detached ledge lying 1⅝ miles **SW.** ½ **S.** from Pemaquid Point light-house, has a depth of 11 feet over it and is marked off its southeast end by a buoy (can, red and black horizontal stripes).

Inner Heron Island Ledge, with 2 feet of water on it, extends ¼ mile in a southwesterly direction from the southern end of Inner Heron Island and is marked on its southern end by a buoy (spar, red, No. 2).

The Bulldog is a rock bare at low water near the southern end of a ledge with 2 feet on it, making out ¼ mile in a southerly direction from the southern end of Inner Heron Island. It lies ¼ mile **E. SE.** ¼ **E.** from red spar-buoy No. 2.

North End Inner Heron Island Ledge, a part of which is bare at low water, makes out 300 yards to the northward from the northern end of Inner Heron Island. It is marked on its northern end by a buoy (red, spar, No. 4).

East Shore Rock, with 8 feet on it, is marked on its western side by a buoy (spar, red, No. 6) lying ¼ mile **SE.** ¼ **E.** from the northern end of Farnum's Point. There is no safe passage to the eastward between this buoy and the shore of Rutherford's Island.

Kelp Ledge, with an unmarked rock bare at low water, lies about 150 yards off the western shore abreast East Boothbay and 600 yards **W. SW.** ¾ **W.** from the southern end of Jones' Point.

A ledge extends about 200 yards to the eastward from Montgomery's Point and has black spar-buoy No. 1 on its eastern side.

1 A. *Approaching and Entering.—From the Southward.*—When Pemaquid Point light is made head for it on any bearing between **NW.** ½ **N.** and **NE.** by **N.**, and when Ram Island light bears **W.** ½ **N.** head for it on that bearing; then proceed as directed in Section 1, foregoing.

Or, to pass to the eastward of the islands off the entrance, steer to the northward, giving the easternmost islands a berth of 1¼ miles, until Ram Island light bears **W.** ½ **N.**; then proceed as directed in Section 1, foregoing.

Remarks.—Approaching Pemaquid Point, Monhegan Island and light will be made to the eastward. The islands making to the southward from Ram Island will be made and left on the port hand. Outer Heron Island Ledge buoy (spar, red and black horizontal stripes) should be left at least 1 mile on the port hand. When standing to the northward, keeping 1¼ miles to the eastward of the islands, this buoy should be left at least ¼ mile on the port hand.

Dangers.—**Moser's Ledge**, see description, page 126, can be avoided by keeping Pemaquid Point light bearing to the northward of **NW.** ½ **W.**

Outer Pumpkin Island Ledge, with 5¾ fathoms on it, **Southeast Breaker**, with 3¾ fathoms on it, **Pumpkin Island Ledge**, with 10 feet on it, **Outer Heron Island Ledge**, with 8½ feet on it and marked by a buoy (spar, red and black horizontal stripes), and **White Island Ledges**, with 5¾ fathoms on it, lying in a general **N NE.** ¼ **E.** and **S SW.** ½ **W.** direction for about 4 miles, will be avoided by keeping Pemaquid Point light bearing to the northward of **NE.** ¼ **N.**, or, by keeping at least 1¼ miles to the southward and eastward of the islands.

The dangers entering Damariscotta River are described under Section 1, foregoing.

1 B. *Approaching and Entering.—From the Westward.*—Shape the course so as to pass about 1½ miles south of Seguin light; steer **NE.** by **E.**, and when Ram Island light is made steer for it between the bearings **NE.** ¼ **N.** and **NE.** by **E.** ¾ **E.**; at night keep in the white rays. When about 500 yards from the light haul a little to the northward, giving it a berth of about 300 yards, and when it bears **SW.** by **W.** ½ **W.** steer **NE.** by **E.** ½ **E.** Inner Heron Island Ledge buoy (spar, red, No. 2) will be nearly ahead, a little on the starboard bow; when about 400 yards from the buoy change course to **N.** by **E.** ¾ **E.** and follow the directions in Section 1, foregoing.

Remarks.—When south of Seguin Island, Mile Ledge buoy (can, red and black horizontal stripes) will be about ½ mile on the port hand. On the **NE.** by **N.** course Tom's Rock buoy (spar, red, No. 2) will be made on the port bow and left about ¾ mile on the port hand. Damiscove Island will be made on the starboard bow and should not be approached closer than ⅝ mile from its southern end. The black bell-buoy south of The Cuckolds will be made on the port bow, and left on the port hand. The course leads about half way between Ram Island light and red spar-buoy No. 2, marking Gangway Ledge. When the course is changed to **NE.** by **E.** ½ **E.** red spar-buoy No. 2 will be about in range with red spar-buoy No. 4, marking Card's Ledge.

The "Remarks" and "Dangers" after passing Inner Heron Island Ledge buoy are given under Section 1, foregoing.

Dangers.—**Mile Ledge**, with 10 feet of water on it, lies nearly 1 mile **S.** ¼ **W.** from Seguin light-house. It is marked on its southern side by a buoy (can, red and black horizontal stripes). There is deep water from 400 yards to the northward of the buoy to Seguin Island, which is bold-to on its southern end.

Tom's Rock, with 9 feet of water on it, is marked by a buoy (spar, red, No. 2) lying 200 yards **SW.** by **S.** from the shoalest part of the ledge and 2¼ miles **NE.** by **E.** ¾ **E.** from Seguin light-house.

An unmarked 11½-foot spot lies ⅝ mile **NW.** ¾ **W.** from the southwestern end of Damiscove Island. It can be avoided by keeping Ram Island light bearing to the eastward of **NE.** ¼ **E.**

The Cuckolds,† two bare islets, are surrounded by ledges which make out 250 yards to the southward. The eastern islet is marked by a beacon (black, wooden tripod, 57 feet high) lying 2⅝ miles **S SW.** ⅛ **W.** from Ram Island light-house. They are also marked by a large black bell-buoy lying ⅝ mile **S.** by **W.** from the beacon, and can be avoided by keeping Ram Island light bearing to the northward of **NE.** by **E.** ¾ **E.** There are several spots, with 14 to 16 feet of water over them, about ½ mile to the westward of the tripod.

An unmarked 16-foot rock lies ¾ mile **W.** ¼ **S.** from Ram Island light-house; it can be avoided by keeping the light bearing to the northward of **E.** ½ **N.**

Gangway Ledge, with 7 feet of water on it, is marked on its southern side by a buoy (spar, red, No. 2) lying 600 yards **N NW.** from Ram Island light-house. An unmarked 15-foot spot lies 400 yards **W.** ½ **N.** from this buoy.

A small unmarked 9-foot spot lies 100 yards to the northward of Ram Island light.

Green Island, lying about 200 yards south from Linekin's Neck, is surrounded by shoals which extend 100 yards to the southward. There is a passage between it and the mainland with 16 feet of water, but it should not be attempted by strangers.

The Hypocrites, bare ledges joined by rocky shoals, extend in a general **N NE.** and **S SW.** direction for ⅝ mile. They are marked on their northern end by a black bell-buoy, lying ⅝ mile **E.** by **S.** from Ram Island light-house.

† It is contemplated to erect a fog-signal on the Cuckolds.

BOOTHBAY HARBOR.†

This is one of the best anchorages on the coast of Maine, and is much used as a harbor of refuge by all classes of vessels. It lies 14 miles **NW.** by **W.** ¾ **W.** from Monhegan Island and 7 miles **NE.** by **E.** ¾ **E.** from Seguin Island and is marked at its eastern entrance by **Ram Island light** (see table of lights, page 112). Lying south of the entrance are several islands and a number of rocks and ledges. The harbor is easy of access and can be entered without a pilot; the principal dangers are marked and easily avoided by vessels of any draught. The entrance between Linekin's Neck on the east and Cape Newagen on the west is 2⅝ miles wide; **Squirrel Island** lies in the middle between these points with a good channel on either side of it. **Burnt Island light** (see table of lights, page 112) is ⅞ mile north of Squirrel Island and is the guide to the anchorage in the harbor.

Linekin's Bay makes in to the northeastward between Linekin's Neck and Spruce Point (the point ⅞ mile east of Burnt Island); it is not used as an anchorage. There are several dangerous unmarked ledges between the entrance and the head of the bay, and Spruce Point ledges (buoyed) lie on the northern side of its entrance.

The town of **Boothbay Harbor** is on the eastern arm at the head of Boothbay Harbor. The deepest draught entering here is 21 feet; the usual draught is about 12 feet; there is from 4 to 12 feet of water alongside the wharves; a least depth of 30 feet at low water can be carried in the channel to the anchorage.

Channels.—The channel from the eastward leads north of the islands off the entrance to the harbor and between Linekin's Neck and Ram Island; it then leads to the northwestward on the east side of Squirrel, Burnt, and Mouse islands, and on the west side of Tumbler Island. The channel from the westward leads between Damiscove Island and Cape Newagen and then to the northward west of Squirrel Island; it then passes east of Burnt and Mouse islands and west of Tumbler Island to the anchorage. The least water found is when passing between Squirrel and Burnt islands, coming from the westward, where there is a small spot with a depth of 21 feet at low water.

Anchorages.—The usual and best anchorage is from the northward and eastward of Mouse Island to the head of the harbor; there is 3 to 7 fathoms of water and good holding ground anywhere in the channel above the island, the water shoaling gradually toward the head of the harbor. The anchorage in East Harbor, off the town, is limited and usually occupied by small craft and fishermen.

Pilots.—Strangers sometimes take a pilot, lying off Cape Newagen or to the southward of Squirrel Island with signal flying until they are boarded.

Tow-boats are seldom used by vessels entering or leaving the bay; they can be had in about 1½ hours by telegraphing to Bath.

Supplies.—Anthracite coal in limited quantity can be had alongside one of the wharves that has 13 feet at high water. Water can be taken alongside the wharves or from water boat. Provisions and ship chandler's stores can be obtained in the town.

Repairs.—There are good facilities for repairing vessels, and two marine railways, one capable of hauling out vessels of 200 tons, the other of 150 tons.

Wind Signals of the U. S. Signal Service are displayed from a staff on Mount Pisgah, and are visible to vessels in the harbor.

Ice occasionally, in severe winters, obstructs navigation above Tumbler Island during February and March.

Currents.—The tidal currents are not strong and require no special precautions. For tidal data see table, page 116.

SAILING DIRECTIONS, BOOTHBAY HARBOR.

1. ***Approaching and Entering.—From the Eastward or Southward.***—Follow the directions in Section 1 or 1 A, "Sailing Directions, Damariscotta River," page 128, and when Ram Island light is made, bearing **W.** ½ **N.**, steer for it, keeping it on that bearing—or, at night, keep in the white rays. Pass from 100 to 200 yards to the northward of the black bell-buoy marking The Hypocrites, and steer **W.** by **N.** so as to pass from 200 to 300 yards to the northward of Ram Island light. Bring Burnt Island light to bear **NW.** ¾ **N.**, and head for it, keeping it on that bearing—or, at night, keep in the white rays. Leave the northern end of Squirrel Island about 400 yards on the port hand, and when 300 to 400 yards from Burnt Island change the course to **N.** by **E.** Leave Burnt Island about 200 yards, and Johnson's or Mouse Island about 300 yards on the port hand, and Tumbler Island 200 yards on the starboard hand. When past Tumbler Island haul a little to the eastward and anchor in the middle of the harbor in from 4 to 7 fathoms water, soft bottom.

If wishing to anchor in East Harbor, off the town, after leaving Tumbler Island steer about **NE.**; pass 150 yards to the southward and eastward of McFarland's Island, and keep at least 200 yards from Spruce Point, the eastern shore; then steer **NE.** by **N.**, and anchor off the town in from 3 to 4¾ fathoms.

†Shown on Coast and Geodetic Survey charts: 314, scale $\frac{1}{40,000}$, price $0.25; and 105, scale $\frac{1}{80,000}$, price $0.50.

Or, if wishing to enter Linekin's Bay proceed as directed above, and when on the **NW.** $\frac{3}{4}$ **N.** course for Burnt Island, the southern end of Squirrel Island bears **SW.** $\frac{3}{4}$ **W.**, distant about $\frac{1}{2}$ mile, steer **NE.** by **N.**, passing midway between Negro Island and red spar-buoy No. 6; anchor to the southward of Cabbage Island in from 9 to 12 fathoms, soft bottom.

Remarks.—Approaching Ram Island from the eastward or southward, the "Remarks" and "Dangers" are given under Sections 1 and 1 A, "Sailing Directions, Damariscotta River," page 128. On the **NW.** $\frac{3}{4}$ **N.** course, after leaving Ram Island, red spar-buoys Nos. 2 and 4 will be left about 600 yards on the starboard hand. Squirrel Island should not be approached nearer than 275 yards on its northeastern end on account of the shoals making out from it. Beyond Squirrel Island red spar-buoy No. 6, and black spar-buoy No. 1, marking the entrance to Linekin's Bay, will be left about $\frac{5}{8}$ mile on the starboard hand. Red spar-buoy No. 4, marking the shoal to the northwestward of Squirrel Island, will be opened out and left about $\frac{5}{8}$ mile on the port hand, and black spar-buoy No. 1 will be on the port bow, open to the southward of Burnt Island; it will be about 1 point forward the beam, distant about 350 yards, when the course is changed to **N.** by **E.** Red spar-buoy No. 8 will be left about $\frac{5}{8}$ mile on the starboard hand on the **N.** by **E.** course. Between Johnson's or Mouse Island and McKown's Point there is good anchorage in from 6 to 9 fathoms of water. There is a narrow passage to the eastward of Tumbler Island, between it and Spruce Point, but strangers are advised not to attempt it.

Dangers.—There is a small unmarked 9-foot spot about 100 yards to the northward of Ram Island light.

Gangway Ledge, with 7 feet of water on it, is marked on its southern end by a buoy (spar, red, No. 2) lying about 600 yards **N NW.** from Ram Island light-house. An unmarked 15-foot rock lies 800 yards **NW.** $\frac{1}{2}$ **N.** from Ram Island light-house.

Card's Ledge, with a bare rock about midway its length and 2 feet of water at its end, makes out for $\frac{1}{4}$ mile in a general **S SW.** direction from the southwestern end of Linekin's Neck; it is marked at its southern end by a buoy (spar, red, No. 4).

Spruce Point Ledges, at the entrance to Linekin's Bay, are about $\frac{1}{4}$ mile long in a general **N.** by **W.** and **S.** by **E.** direction. They are marked on their northern end by a buoy (spar, black, No. 1), and on their southern end by a buoy (spar, red, No. 6).

Tumbler Island Ledge, with 12 feet on it, lying $\frac{1}{2}$ mile **E.** $\frac{3}{4}$ **N.** from Burnt Island light-house, is marked on its western side by a buoy (spar, red, No. 8). There is a passage to the eastward of the buoy by giving it a berth of 250 yards.

McFarland's Island Ledge buoy (spar, black, No. 3) is about 100 yards east of **McFarland's Island**, at the north side of entrance to East Harbor, and $\frac{1}{2}$ mile **NE.** by **N.** from the north point of Tumbler Island.

1 A. ***Approaching and Entering.—From the Westward or Southward.***—Follow the directions in Section 1 B, "Sailing Directions, Damariscotta River," page 129, until the beacon on The Cuckolds bears **N.**, distant about $\frac{1}{2}$ mile, then steer **N.** by **E.** $\frac{1}{2}$ **E.** for Burnt Island light—or, at night, keep in the white rays. Pass about $\frac{1}{4}$ mile to the eastward of The Cuckolds, and the same distance to the westward of Squirrel Island; black spar-buoy No. 1, marking Burnt Island Ledge, will be ahead and about in range with Burnt Island light. When about $\frac{1}{4}$ mile from the light, haul to the eastward; give Burnt Island a berth of 200 to 300 yards, then steer **N.** by **E.** and follow the directions given in Section 1, foregoing.

Or, coming from the southward, when south of Bantam Rock red whistling-buoy, steer so as to pass $\frac{1}{2}$ mile to the westward of the buoy, and then steer **N.** by **E.** $\frac{1}{2}$ **E.** for Burnt Island light—or, at night, keep in the white rays of that light, and follow the directions in the foregoing paragraph.

If wishing to enter Linekin's Bay, with the black bell-buoy marking The Cuckolds bearing **W.**, distant $\frac{1}{2}$ mile, steer **NE.** $\frac{1}{2}$ **N.**; give the southeastern end of Squirrel Island a berth of about 300 yards, and when past this end of the island, haul a little more to the northward, so as to pass about 200 yards to the northward of Negro Island. Continue the **NE.** $\frac{1}{2}$ **N.** course into Linekin's Bay, passing midway between Negro Island and red spar-buoy No. 6, and anchor to the southward of Cabbage Island in from 9 to 12 fathoms water.

Remarks.—For "Remarks" and "Dangers," approaching from the westward, until up with The Cuckolds,† see Section 1 B, "Sailing Directions, Damariscotta River," page 129. The black whistling-buoy off The Cuckolds will be left about 400 yards on the port hand. Coming from the southward, after leaving the whistling-buoy, Bantam Rock buoy (can, red, No. 2) will be made on the starboard bow and left about $\frac{5}{8}$ mile on the starboard hand. The Cuckolds are bold-to on their eastern side and may be approached to about 150 yards. Squirrel Island should not be approached closer than 250 yards on its western side. Squirrel Island Ledge buoy (spar, red, No. 4) will be made on the starboard bow and left about 300 yards on the starboard hand.

Approaching Linekin's Bay from the westward Squirrel Island should not be approached closer than 250 yards on account of shoals making out from its eastern side. **Cabbage Island** is the narrow high island lying about 1 mile **N.** by **E.** $\frac{3}{4}$ **E.** from the northern end of Negro Island.

† It is contemplated to build a fog-signal on the Cuckolds.

Dangers.—**Bantam Rock** is described on page 25.

Squirrel Island Ledge makes out ¼ mile in a **NW.** direction from the northern end of Squirrel Island. It is marked on its end by a buoy (spar, red, No. 4).

Burnt Island Ledge, with 4½ feet on it, is marked on its southern side by a buoy (spar, black, No. 1). This buoy should be given a berth of about 150 yards when passed to the eastward. There is no safe passage between it and Burnt Island.

The remaining dangers are described under Section 1, foregoing.

SHEEPSCOT BAY AND RIVER. †

Sheepscot Bay, the approach to Sheepscot River, has deep water, and the principal dangers are either marked by buoys or can be seen at any stage of the tide. It lies between Cape Newagen on the east and Salter's Island, at the entrance of the Kennebec River, on the west.

Sheepscot River extends in a **N NE.** direction 18¼ miles to the village of Sheepscot Bridge. Its entrance is about 5 miles **NE.** from Seguin Island and between Cape Newagen on the east and Griffith's Head on the west. **Hendricks Head light** (see table, page 112), on the eastern shore of the river, about 2¾ miles above its mouth, is the guide for entering. Sheepscot Falls, about 16¾ miles above its mouth, is the head of navigation for vessels of over 5 feet draught; 5 fathoms can be taken to Wiscasset at low water. Between Wiscasset and Sheepscot Falls two bridges cross the river; the width of the draws is about 33 feet.

Cape Harbor is an anchorage for small vessels between Cape Newagen and Cape Island; it is only used by local fishermen.

Herman Harbor is a long narrow cove making in to the northward on the western shore of the river about 1½ miles above Griffith's Head. It has good anchorage in 4 to 7 fathoms water, but has a very narrow entrance. There is a small village on its western shore.

Christmas Harbor is a small cove in the eastern shore about 1⅝ miles to the southward of Hendricks Head.

Hendricks Harbor is a small harbor, the entrance to which lies about ⅜ mile **S SE.** from Hendricks Head. Only small local vessels use this anchorage, the depth being 5 to 8 feet at low water. There is a small village on its eastern shore.

Five Islands Harbor is a narrow passage between the Five Islands and the Georgetown Island shore, forming a small but secure harbor with 3 to 5 fathoms at low water. The entrance is opposite Hendricks Head light and bearing about **W NW.** ½ **W.** from it. The village of **Five Islands** is on the western shore of the harbor.

Ebenecook Harbor is an excellent anchorage for vessels of 20 feet draught; its entrance lies about 1 mile above Hendricks Head light on the eastern shore of the river, and leads between Dog Fish Head on the south and the Green Islands on the north. It is the first anchorage available for large vessels entering the river. The village of **West Southport** is at the southern end of the harbor; the steamers plying between Boothbay Harbor and Bath stop here. There is from 4 to 10 feet of water alongside the wharves of the village. Strangers generally take a pilot when bound to West Southport.

Townsend Gut, leading into Boothbay Harbor, is to the northward of Ebenecook Harbor (see inside passage from Boothbay Harbor to Bath).

Little Sheepscot River and **Goose Rock Passage** are in the western shore, the former on the south and the latter on the north side of McMahan's Island; they both lead into Sassanoa River.

Back River is a shallow, and in places narrow stream, between Barter's Island and the mainland; its entrance is on the eastern side about 3¼ miles to the northward of Hendricks Head.

On the west shore of the river, opposite the entrance to Back River, are three small coves, **Jewett's**, **Long**, and **Tarbox coves**. The village of **Westport** is on the west shore opposite the southern end of Barter's Island.

Cross River makes to the eastward at the northern end of Barter's Island, about 6¼ miles above Hendricks Head. This river has a good deep channel for 1¼ miles, but is little used except by vessels loading ice; Back River makes into it from the southward about ⅜ of a mile from its entrance.

On the west shore opposite Cross River is a broad shallow bight with three coves that are dry at low water.

Wiscasset is a town on the west shore of the river 11 miles above Hendricks Head light, and can be reached by deep draught vessels; the usual draught of vessels entering here is 10 to 16 feet. **Sheepscot Falls** is a village about 3 miles above Wiscasset; 20 feet of water can be taken up to it.

Sheepscot Bridge is a village about 4½ miles above Wiscasset; it can only be reached by vessels of less than 5 feet draught.

Prominent features.—Seguin Island and light are the off-shore guide to the entrance. **Southport Island**, on the eastern side of the entrance, is high and wooded; on its western side, about 2¾ miles above the Cuckolds, is **Hendricks Head light-house.** The western shore is comparatively low; **Griffiths Head**, a whitish, rocky point about 30 feet high, is the western point at the entrance to the river and lies about 4½ miles **NE.** by **N.** from Seguin.

The channel of the river up to Hendricks Head light is wide and free from dangers, but above this for a distance of about 3¼ miles it leads between islands, rocks, and ledges—the most dangerous of which are marked by buoys—

† See foot note on page 130.

View of Approaches to Johns Bay, Pemaquid Lt.Ho. bearing NE.¼ N., distant 1½ Miles.

View of Entrance to Sheepscot River, Hendricks Head Lt.Ho. bearing N. by E.¼ E., distant 3½ Miles.

which contract the channel to a width of ¼ mile in its narrowest part. Above the village of Westport the channel is comparatively free from dangers until up to Davis Island, where it makes a sharp turn to the westward and forms Wiscasset Harbor; at this point there are several rocks marked by a buoy. Above Wiscasset the channel is narrow and crooked.

Anchorages.—**Jewett's Cove**, in the west shore, about 2¾ miles above Hendricks Head, has good anchorage for light draught vessels. **Colby's Cove**, about 2¼ miles above Cross River on the west shore, affords good anchorage in 4 to 8 fathoms. Merrill's Ledge spindle is to the northeastward of the anchorage. The best anchorage at Wiscasset is below the bridge and well over toward the wharves of the town. Above Wiscasset vessels bound to Sheepscot Falls anchor anywhere in the channel where the bottom and depth are suitable.

Pilots can be had by making signal when entering the bay and standing up to Hendricks Head. Strangers entering the river usually take a pilot or tow-boat. Vessels bound to Sheepscot Falls generally take a pilot at Wiscasset.

Tow-boats are sometimes used by vessels bound up the river; they can be had from Wiscasset. Vessels bound above Wiscasset generally tow.

Supplies.—Anthracite coal in limited quantities can be obtained at the wharf near coal depot at Wiscasset. Provisions and ship chandler's stores can be had at Southport, Georgetown, Westport, Wiscasset, and Sheepscot Falls.

Repairs to vessels can be made at the shipyard at Wiscasset. The nearest places having marine railways are Boothbay Harbor and Bath. Repairs to machinery of steamers can be made at Bath.

Marine Hospital.—Relief is furnished under the provisions of the regulations for the Marine Hospital Service as to third class stations. See also Appendix IV.

Ice does not interfere with navigation up to Wiscasset. Ebenecook Harbor is always open. Above Wiscasset the river is closed by ice for a distance of 3 miles below Sheepscot Falls.

Currents.—The currents in the river generally flow in the direction of the channel and are quite strong in the narrow parts. At the entrance to Cross River the flood sets on to Quarry Point. The ebb sets on to Clough's Point.

SAILING DIRECTIONS, SHEEPSCOT RIVER TO WISCASSET.

1. ***Approaching and Entering.***—***From the Eastward.***—Follow the directions in Section 1 or 1 A, "Sailing Directions, Damariscotta River," page 128, and when Ram Island light bears **W.** ½ **N.** steer for it and pass from 100 to 200 yards to the northward of the black bell-buoy marking the Hypocrites; round Ram Island light, giving it a berth of 200 to 300 yards; bring it to bear **NE.** by **E.** ½ **E.** and steer **SW.** by **W.** ½ **W.** Pass to the southward of the black bell-buoy marking The Cuckolds, and steer about **W.** by **N.** for 2 miles until Hendricks Head light bears **N.** by **E.** ½ **E.**; then steer **N.** by **E.** ¼ **E.** Pass about ¾ mile to the westward of Lower Mark Island, ⅜ mile west of Cat Ledges, and 300 yards to the westward of Hendricks Head. Then follow the directions in Section 2.

If desiring to anchor in Ebenecook Harbor, continue the **N.** by **E.** ¼ **E.** course about ¾ mile past Hendricks Head light; Dog Fish Head will then bear **E.**; then steer so as to pass about 100 yards to the northward of it, between it and the Green Islands. When past the southernmost point of the Green Islands haul a little more to the northward, keeping about 200 yards from the islands, and when the southernmost point bears **W.**, steer **E.** and anchor about 200 yards from the eastern shore in about 4 fathoms, soft bottom.

Remarks.—Approaching Ram Island light, the "Remarks" and "Dangers" are given under Sections 1 and 1 A, "Sailing Directions, Damariscotta River." On the **SW.** by **W.** ½ **W.** course the black wooden beacon marking The Cuckolds will be on the starboard bow, and ⅜ mile to the southward of it will be seen the black bell-buoy bearing a little on the starboard bow.

On the **W.** by **N.** course **Griffith's Head**, a bare, light colored, rocky headland, will be seen on the starboard bow, and a buoy (spar, red and black horizontal stripes) open a little to the northward of it.

On the **N.** by **E.** ¼ **E.** course Lower Mark Island, small, wooded with spruce and fir, will be on the starboard bow and left about ¾ mile on the starboard hand. The bare rock at the northern end of Cat Ledges should be left about ⅜ mile on the starboard hand. The eastern shore to the southward of the Cat Ledges should not be approached closer than ¼ mile.

Entering Ebenecook Harbor, give the eastern shore above Hendricks Head a berth of over 300 yards until nearly up to Dog Fish Head. The southern end of Green Island should not be approached nearer than 150 yards, to avoid the ledge making out from it. **Dog Fish Head** is a small, bare, rocky headland, with a deep chasm showing to the westward; when seen from the southward it looks like a small bare islet, the land connecting it with the mainland being low.

Dangers.—**The Cuckolds** are two bare rocks surrounded by ledges except on the eastern side, the easternmost marked by a beacon (black wooden tripod 54 feet high, upper half covered with boards) lying 2⅝ miles **S SW.** ½ **W.** from Ram Island light-house. **Collector's Ledge**, with 6 feet of water on it, makes out about 250 yards to the

southward from The Cuckolds. An unmarked 16-foot spot lies ½ mile W. by S. from the beacon on The Cuckolds, and the same distance NW. by N. from the black bell-buoy. See the foot note on page 131.

Cat Ledges, bare at low water, extend for ½ mile in a general S SE. ½ E. direction from a bare rock which marks its northern end, and which lies 1 mile S. ¼ W. from Hendricks Head light-house.

Cedarbush Ledge, with 10 feet of water on it, lies nearly ¼ mile S. ¼ W. from Hendricks Head light-house and 200 yards SW. from Cedarbush Island.

An unmarked 15-foot spot lies in Ebenecook Harbor 400 yards SE. from the southern end of Green Islands, and can be avoided by keeping Dog Fish Head bearing to the southward of W. ½ N.

1 A. ***Approaching and Entering.—From the Westward or Southward.***—Bring Seguin light to bear W., distant 2¾ miles—Pond Island light will then bear about NW. ¾ W.—and steer N. by E. ¼ E., leaving Tom's Rock buoy (spar, red, No. 2) ⅝ to 1 mile on the port hand, and Griffith's Head Ledge buoy (spar, red and black horizontal stripes) ¼ to ¾ mile on the port hand. Pass about 350 yards to the westward of Hendricks Head and follow the directions given in Section 2, following.

Passing ¼ mile to the westward of Bantam Rock red whistling-buoy a N. by W. course, if made good until Hendricks Head light bears N. by E. ½ E., leads clear of all dangers; then steer N. by E. ¼ E., passing about 350 yards to the westward of Hendricks Head light, and proceed as in Section 2.

Remarks.—Coming from the westward, pass to the southward of Seguin Island, being careful to give Mile Ledge buoy (can, red and black horizontal stripes) a berth of at least 300 yards.

On the N. by E. ¼ E. course The Sisters, three small bare rocks, will be left from ⅝ to 1 mile on the port hand, and about 1 mile further to the northward The Black Rocks, two small bare islets and a rock awash at high water, will be left ⅝ mile to 1½ miles on the port hand. Griffith's Head, a bare, white, rocky headland about 40 feet high, will be made on the port bow and left about 1 mile on the port hand. Hendricks Head light will be on the starboard bow.

Dangers.—**Mile Ledge**, with 10 feet of water on it, lies nearly 1 mile S. ½ W. from Seguin light-house. It is marked on its southern side by a buoy (can, red and black horizontal stripes). See also page 129.

Tom's Rock, a small detached ledge with 9 feet of water on it, lies 2¼ miles NE. by E. ¾ E. from Seguin light-house, and is marked by a buoy (spar, red, No. 2) lying 200 yards SW. by S. from the shoalest part of the ledge.

The Sisters, three small bare rocks with shoals surrounding them for about 100 yards, lie 2⅛ miles E. by S. from Pond Island light-house and a little over ½ mile N. from Tom's Rock.

The Black Rocks are two bare islets and a rock awash at high water, extending ⅝ mile in a general NE. ½ N. and SW. ½ S. direction, the northern one lying 1⅛ miles S. ½ W. from Griffith's Head. There is a 13-foot spot about 300 yards SW. from the southern bare rock.

Sloop Ledge, with 6 feet of water on it, lies 1 mile S SW. ¾ W. from Griffith's Head; it is marked by a buoy (spar, black, No. 1) lying 200 yards SW. from the shoalest part of the ledge.

Griffith's Head Ledge, with 7 feet of water on it, lies ½ mile E. by S. from Griffith's Head, and is marked on its southern end by a buoy (spar, red and black horizontal stripes). The remaining dangers are given under Section 1, foregoing.

Bantam Rock is described on page 25.

2. ***From Hendricks Head to Wiscasset.***—Pass about 300 yards to the westward of Hendricks Head light and continue the N. by E. ¼ E. course about 3¾ miles; the following are the aids in the order and on the side they should be left.

On the Port hand.	On the Starboard hand.
1. Bull's Ledge buoy (spar, red and black horizontal stripes), distant 450 yards.	
2. Middle Mark Island, small, bare rock, distant 250 yards.	
	3. South Powderhorn buoy (spar, black, No. 1), distant 700 yards.
4. Middle Ledge buoy (spar, red and black horizontal stripes), distant 200 yards.	
	5. Powderhorn Island, rocky islet, grassy on top, distant 400 yards.
6. Clou's Ledge spindle (iron, black) and Clou's Ledge buoy (spar, black, No. ½), distant 300 yards.	

On the Port hand.

8. Four Foot Rock buoy (spar, red and black horizontal stripes), distant 350 yards.

10. Upper Mark Island, small bare islet off Kehail's Point, distant 200 yards.

12. Hodgdon's Ledge buoy (spar, black, No. 3), distant 200 yards.

On the Starboard hand.

7. Powderhorn Ledge buoy (spar, red, No. 2), distant 250 yards.

9. Ram Island, low and grassy, with scattered trees, distant 500 yards.

11. Ram Island Ledge buoy (spar, black, No. 1), at the entrance to Back River, distant 800 yards.

13. Stover's Ledge buoy (spar, red, No. 4), distant 400 yards.

When Stover's Ledge buoy bears **E.** steer **N NE. ¼ E.** for Greenleaf's Ledge buoy (spar, black, No. 5), giving the eastern shore a berth of at least 300 yards. When nearly up to the buoy haul to the eastward; steer **NE. ¾ N.** and pass about midway beeween Quarry Point and Fowle's Point. Keep about a mid-river course until nearly up to Merrill's Ledge red spindle, then stand over toward the western shore. When about ⅜ mile above the spindle, follow a mid-river course, favoring slightly the eastern shore. Round Clough's Point, giving it a berth of about 250 yards on the port hand; pass about 100 yards to the southward of Old Fort McDonough and 100 yards to the northward of Seal Rock buoy (spar, black No. 7). Bring the buoy to bear **S. ¾ E.** and steer **N. ¾ W.** for the town; anchor off the wharves in 4 to 6 fathoms.

Remarks.—Above Hendricks Head for a distance of 4 miles the river is much obstructed by islands and ledges, but there is a good channel between them; the most prominent dangers are marked. For the remainder of the distance to Wiscasset the river is comparatively unobstructed and a mid-river course leads clear of danger. **Quarry Point**, on the east side of the river, 6½ miles above Hendricks Head light, is well wooded; in light winds vessels should not pass close to the point on a flood current. **Fowle's Point** slopes gradually toward the water. It is grassy, with a few scattered trees. There are several houses back from the end of the point. The channel makes a sharp turn to the westward at Clough's Point; on the ebb vessels should pass well to the northward of the point, so as not to be set on it by the current.

Dangers.—An unmarked 16-foot spot lies 300 yards from the eastern shore and ⅝ mile **N.** by **E. ¼ E.** from Hendricks' Head light-house.

Bull's Ledge, with 9 feet of water on it, extends 400 yards **N.** by **E. ½ E.** from the buoy (spar, red and black horizontal stripes) marking its southern end, and which lies ⅞ mile **N.** by **W. ½ W.** from Hendricks Head light-house.

Middle Mark Island, a small, round, bare rock, is in the center of a ledge making ¼ mile in a **N.** by **E.** and **S.** by **W.** direction, and lies about ¼ mile to the eastward of McMahan's Island and 1½ miles **N. ¼ E.** from Hendricks Head light-house. **Mark Island Ledge**, with 7 feet on it, extends parallel to and about 100 yards to the westward of the above-mentioned ledge.

Harding's Ledge, with 8 feet of water on it, lies on the eastern side of the channel and extends 400 yards in a **S SW.** direction to the southward of black buoy No. 1, marking Powderhorn South Ledge. There is a channel about 80 yards wide south of the buoy, between it and the northern end of Harding's Ledge.

Powderhorn South Ledge, awash at low water, extends a little over ¼ mile **S.** from Powderhorn Island. It is marked on its southern end by a buoy (spar, black, No. 1).

Middle Ledge, off the southern side of the entrance to Goose Rock Passage, has 10 feet of water on it, and is marked on its southern side by a buoy (spar, red and black horizontal stripes).

Clou's Ledge, on the west side of the channel and on the north side of the entrance to Goose Rock Passage, is awash at half tide, and is marked by a black spindle on the middle of the ledge and a buoy (spar, black, No. 1) off its northern end.

Powderhorn Ledge makes out for 400 yards in a **N.** by **W.** direction from the northern end of Powderhorn Island. It is marked on its northern end by a buoy (spar, red, No. 2). The course leads about midway between this buoy and Four Foot Rock buoy (spar, red and black horizontal stripes) on the west side of the channel.

Four Foot Rock lies on the west side of the channel about ¼ mile **N. ¼ E.** from Clou's Ledge spindle. It is marked on its southern side by a buoy (spar, red and black horizontal stripes).

An unmarked 18-foot rocky spot lies on the west side of the channel ¼ mile **S.** by **W. ¼ W.** from Upper Mark Island, and can be avoided by keeping the island bearing to the northward of **N. ¼ E.** when within ¼ mile of it.

Upper Mark Island has a shoal making out 600 yards N by E. ½ E., and extending almost to black spar-buoy No. 3 marking Hodgdon's Ledge. It can be avoided by keeping the buoy bearing to the northward of N. by E. when within ½ mile of it.

Ram Island Ledge, awash at low water, extends ⅝ mile in a N NE. direction from Ram Island to the entrance to Back River. It is marked near its northern end by a buoy (spar, black, No. 1) which is a guide to the entrance to Back River.

Hodgdon's Ledge, on the western side of the channel, lies ⅝ mile N. by E. ½ E. from Upper Mark Island. It is bare at half tide, and marked on its southern side by a buoy (spar, black, No. 3). The course should lead about midway between this buoy and red spar-buoy No. 4, on the eastern side of the channel.

Stover's Ledge, ½ mile N. by W. from the southern end of Barter's Island, is bare at low water, and marked by a buoy (spar, red, No. 4) on its southwestern end.

Greenleaf's Ledge, ⅝ mile S SW. ½ W. from the southern end of Fowle's Point, is a small, bare rock surrounded by ledges, and marked on its southeastern side by a buoy (spar, black, No. 5).

An extensive shoal, with from 4 to 16 feet of water on it, extends for a mile in a SW. direction from Fowle's Point, and fills up the bight in the western shore, the approach to the entrance to McCartey's, Greenleaf's, and Fowle's coves.

Merrill's Ledge, bare at half tide, extends for a little over ¼ mile in a NE. by N. direction from the red spindle marking its southern end. There is no passage between this spindle and the eastern shore.

An unmarked shoal, with 8 feet on it, makes out 400 yards in a NE. by N. direction from Hilton's Point, which is on the western shore ⅝ mile to the southward of Clough's Point. An unmarked 17-foot spot lies 600 yards NE. by N. from Hilton's Point, and 200 yards from the western shore.

Clough's Point has ledges making out about 175 yards from it, and should be given a berth of about 250 yards.

Seal Rock, bare at half tide, lies 500 yards NW. by W. from the northern end of Clough's Point; it is marked on its northern end by a buoy (spar, black, No. 7).

An unmarked shoal with 10 feet of water on it lies in the northeastern side of the harbor, and its southern end lies NW. from the southern end of Davis Island, leaving a passage about 350 yards wide between it and the wharves at the southern part of the town.

Birch Point Ledge, unmarked, with 7 feet of water on it, lies about ⅝ miles N NW. from black buoy No. 7, and about 250 yards from the southern end of The Boom.

INSIDE PASSAGE FROM BOOTHBAY HARBOR TO BATH.†

This passage is about 11 miles long and leads between the islands lying between Boothbay Harbor and the Kennebec River, forming an inland passage from Boothbay Harbor to Bath. The only vessels using this passage are the small steamers running from Boothbay Harbor to Bath, and small vessels owned in the vicinity.

The channel is very narrow in some places, and much obstructed by rocks and shoals, and, although many of the dangers are marked, strangers should not attempt to pass through without a pilot. The passage leads through Townsend Gut, across Sheepscot River, through Goose Rock Passage into Sassanoa River; about midway through Sassanoa River the channel crosses the southeastern part of Hockomock Bay, and then continues through the Sassanoa River, coming out in the Kennebec River opposite the city of Bath.

Townsend Gut is a narrow, crooked passage leading from Boothbay Harbor into Sheepscot River; the eastern entrance to the gut is NW. from Mouse Island, in Boothbay Harbor; its western entrance lies E. from Boston Island, in Sheepscot River, and to the northward of Ebenecook Harbor.

Goose Rock Passage is on the western side of Sheepscot River, north of McMahan's Island, and leads to the westward into the eastern end of Sassanoa River.

Little Sheepscot River is a narrow passage leading from Sheepscot River into the entrance of Sassanoa River to the southwestward of McMahan's Island.

Sassanoa River is an estuary leading from Sheepscot River to Kennebec River, north of Georgetown and Arrowsic islands; it has numerous coves and bays making off to the northward and southward, but none of them are of commercial importance. Near its western end the river is crossed by a drawbridge. The principal coves and bays making to the southward are Robin Hood Cove, Riggs' Cove, Hall's Bay, and Back River, the latter separating Georgetown and Arrowsic islands. To the northward is Heal's Cove and Hockomock Bay; from the latter Montseag and Brooking's bays lead to the northward; the former separates Westport Island from the mainland, and joins the Sheepscot River at Wiscasset, through Back River. Knubble Bay is the broadest part of the river, after passing Robin Hood Cove and The Knubble, before entering Hockomock Bay when coming from the eastward. **Great Hell Gate** is the crooked passage from Knubble Bay into Hockomock Bay. **Upper Hell Gate** is about two miles from the western entrance to the river; this is its narrowest part, and is only about 60 yards wide.

No directions of practical use can be given for this passage; small steamers, or yachts, desiring to pass through, should take a pilot at Boothbay Harbor or Bath.

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†Shown on Coast and Geodetic Survey charts: 315a, scale $\frac{1}{20,000}$, price $0.20; 314, scale $\frac{1}{40,000}$, price $0.25; and 105, scale $\frac{1}{80,000}$, price $0.50.

KENNEBEC RIVER.†

BATH, RICHMOND, GARDINER, HALLOWELL, AND AUGUSTA.

This river is one of the most important waterways on the coast of Maine, and is navigable to the city of Augusta, 40 miles above its entrance, for vessels of 10 feet draught. Vessels drawing 22 feet ascend to Bath, 12 miles above Pond Island. The river entrance, which is about 3½ miles to the eastward of Cape Small and 2 miles north of Seguin Island, is marked by **Pond Island light** on its western side (see table of lights, page 112). The river and entrance are somewhat obstructed by rocks and ledges, the principal ones being marked by buoys or spindles, and it has strong tidal currents. Strangers wishing to enter should take a pilot or tow-boat near Seguin or Pond islands. Large vessels, when unable to get a pilot or tow-boat on account of unfavorable weather, sometimes make an anchorage in Boothbay Harbor and wait for a favorable wind to enter the Kennebec.

Stage Island Bay and **Sagadahoc Bay** form a shallow body of water extending in a northerly direction 1¾ miles from Salter's Island on the east and Stage Island on the west. They are unfit for an anchorage, the northern part of Sagadahoc Bay being dry at low water.

Heal's Eddy is a small, shallow cove making in to the northward, west of Stage Island; the entrance is about N. by E. from Pond Island. Good anchorage is found in places off the entrance between it and the Sugar Loaves, but strangers should not anchor here.

Hunniwell's Point is a village, with several summer hotels, on the western point at the entrance of the river. A life-saving station is located on the beach to the eastward of the hotels, and to the northward of the station is **Fort Popham**, a large, unfinished granite structure.

Atkins Bay is a shallow bight, almost entirely dry at low water, in the west shore, above Fort Popham.

Parker's Head Village is on the west bank, 2 miles above Fort Popham (see Anchorages).

Todd's Bay is a shallow body of water to the eastward of the islands opposite Parker's Head Village.

Back River, a crooked stream with narrow, shallow channel, makes into the eastern shore about 1¼ miles above Parker's Head. This river separates Georgetown and Arrowsic islands and enters the Sassanoa River at Hockomock Bay.

Phippsburg is a village on the west bank about 2 miles above Parker's Head.

Drummore's Bay is a shallow bight west of Lee's Island and north of Phippsburg.

Fisher's Eddy is a small bight in the east shore about 2½ miles above Phippsburg. **Bluff Head** is on the western side of the bight; the full width of the river abreast Bluff Head is about 200 yards.

Fiddler's Reach is a sharp bend to the westward in the river about 1½ miles above Fisher's Eddy.

Winnegance Creek is a broad, shallow creek emptying into the western end of Fiddler's Reach where the river takes a sharp turn to the northward. The village of **Winnegance** is situated on the western shore of the creek.

The city of **Bath** is on the west bank of the river 12 miles above Pond Island; one of its largest industries is ship-building. The deepest draught of vessels ascending to Bath is 22 feet, but a greater draught can be carried up at high water; there is 10 to 25 feet of water alongside the wharves.

Woolwich is a village on the east bank opposite Bath, and is the terminus of the Knox & Lincoln Railway.

Merry Meeting Bay is a large, shallow body of water making into the west shore of the river about 2¼ miles above Telegraph Point; the village of **Bodoinham** is on its northern shore.

Richmond is a town on the west bank about 12 miles above Bath. The deepest draught of vessels loading here is 14 feet; vessels of 15 to 16 feet draught can come here when the river is high in the spring and fall; the depth alongside the wharves is 12 feet at low water.

The city of **Gardiner** is on the west bank of the river about 10 miles above Richmond. The deepest draught of vessels loading here is 15 to 16 feet during the spring and fall; 12 to 14 feet is the usual draught; there is 6 to 16 feet of water alongside the wharves at low water.

The village of **Pittston** is on the east bank of the river opposite Gardiner, and is connected with it by a draw-bridge; the width of the draw, in the clear, is about 69 feet.

Hallowell is a city on the west bank about 4 miles above Gardiner; the deepest draught that can be carried up to it is 10 feet.

Augusta, the capital of the State, is on the west bank of the river about 2 miles above Hallowell, and at the head of navigation and tide water. The deepest draught carried up to it is 10 feet. A small steamer runs between Augusta and Gardiner.

The channels of the approach to the entrance are well marked; the eastern one has a least depth of 5½ fathoms between Pond Island and the Whale's Back. The western channel has a depth of 4 to 5 fathoms on the sailing line. Above Fort Popham and up to Fiddler's Reach the least depth is 24 feet, and from thence to the city of Bath 28 feet. In several places islands and ledges contract the channel to a width of about 100 yards. Above Bath the

† The entrance to Abagadasset Point is shown on Coast and Geodetic Survey charts: **314**, scale $\frac{1}{40,000}$, price $0.25; **105**, scale $\frac{1}{80,000}$, price $0.50.

The river from Abagadasset Point to Augusta is shown on two sheets: **316 a and 316b**, scale $\frac{1}{10,000}$, price of each $0.50.

channel is narrow and crooked in places, and about 3 miles below the town of Richmond it is divided by **Swan Island** (township of Perkins), which extends to the town of Richmond. The eastern channel along Swan Island is used by the deeper draught vessels; it is being improved under the supervision of the U. S. Engineers. The western channel is sometimes used by steamers bound to Richmond and by light-draught vessels. At Richmond the channels unite, and above this it is narrow and has a number of dangerous ledges and shoals. Many of the dangers are marked by aids to navigation placed by the Government, and in difficult parts of the channel tow-boat captains have placed additional aids for their own use.

Anchorages.—The holding ground below Hunniwell's Point at the entrance is poor, and vessels should not anchor unless forced to do so. If obliged to anchor when inside Pond Island, it is advisable to come to in the channel abreast the life-saving station with a long scope of chain; if not blowing strong a vessel may ride here if care is taken to keep the anchor clear. The best anchorage is off Parker's Head Village, toward the eastern shore below Perkins Island; there is good anchorage here in 5 to 7 fathoms water, and drift ice coming down the river generally follows the western shore. Above Parker's Head Village vessels anchor wherever they can find good holding ground and suitable depth, keeping out of the strength of the current.

For **Harbor Regulations** for Bath and Gardiner see Appendix II.

For **Quarantine Regulations** see Appendix II.

Marine Hospital.—Relief is furnished by an acting assistant surgeon of the Marine Hospital Service. Patients requiring long-continued hospital treatment are sent to the Marine Hospital at Portland, Me. (See also Appendix IV.)

Pilots will come out to a vessel making signal when near Pond Island. There are several pilot lookouts at the entrance of the river; the principal lookout is on Cox's Head, from which there is communication with the city of Bath by telephone. Strangers generally take a pilot, or, if a large vessel, a tow-boat. Under no circumstances should a stranger attempt to enter at night.

Tow-boats will generally be found off the entrance waiting to take vessels into the river. If one is not met outside they can be had by making signal when near Pond Island. Tow-boats will also be found at Bath to take vessels farther up the river.

Supplies.—Anthracite and bituminous coal can be obtained alongside wharves at Bath and Gardiner; anthracite coal can be had at Richmond. Fresh water can be had alongside the wharves at Bath, Richmond, and Gardiner; the water in the river is fresh at Richmond and above. Provisions and ship chandler's stores can be obtained at the cities and towns on the river.

Repairs.—Bath has excellent facilities for repairing vessels or the machinery of steamers. There are several large shipyards at which the largest class of sailing vessels are built. There is one marine railway capable of hauling out vessels of 1,000 tons. The Bath Iron Works have good facilities for repairing engines and boilers.

Communication.—Bath and the principal cities and towns on the Kennebec River are on or near the line of the Maine Central Railway. Gardiner and points on the river below it, also have semi-weekly steamboat communication with Portland and Boston.

Freshets occur in March and April, also after heavy rains in the fall, but they are not dangerous to shipping unless accompanied by ice.

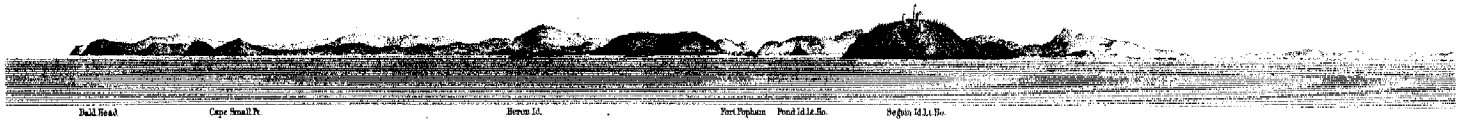
Ice usually closes the river to navigation above Bath from December to April. In severe winters the river may be closed below Bath for a limited period. Vessels entering the river do so on the flood tide, and if unable to reach Bath on one tide, anchor below Perkins Island, on account of the drift ice which makes an anchorage in other parts of the river dangerous. Steamers, or vessels assisted by them, are rarely delayed by ice.

Tidal currents.—The tidal currents have considerable velocity at the entrance and in the narrow parts of the river; some local knowledge of their set is necessary to insure safety to vessels under sail. The direction of the currents at the entrance is influenced by strong winds, especially easterly gales. During spring tides and freshets the velocity of the ebb current is increased and requires special attention. No complete observations have been made to determine the set and velocity of the currents.

Tides.—The corrected establishment at Hunniwell's Point is 11 hours 24 minutes. It is high water at Phippsburg about 20 minutes later, at Bath about 1 hour later, at Bodoinham about 1½ hours later, and at Pittston about 3 hours later than at Hunniwell's Point; (see also the table on page 116).

SAILING DIRECTIONS TO ENTER KENNEBEC RIVER.

Vessels approaching Kennebec River should have clear weather, and, if desiring to sail to the anchorage off Parker's Head Village, should have a strong fair wind when the tidal current is running ebb. No vessel can beat into the river against the current, and only small vessels attempt it even with a favorable current. In heavy weather it is advisable to anchor in Boothbay Harbor if to the eastward, or in Harpswell Harbor if to the westward. See "Pilots" and "Tow-boats" in the general information preceding.



View of Approaches to Kennebec and Sheepscot Rivers, Seguin Id. Lt. Ho. bearing N. by E. ¼ E., distant 3 Miles.

Entrance to Portland Harbor, Portland Head Lt. Ho. bearing N.W. ¼ W., distant 3 Miles.

1. ***Approaching and Entering.—From the eastward alongshore.***—Having followed the directions for entering Boothbay Harbor from the eastward, page 130, and when Ram Island light bears S., distant about 250 yards, steer SW. by W. ¼ W. and pass about 200 yards south of the bell-buoy off The Cuckolds. Burnt Island light will be sighted to the westward of Squirrel Island. With the bell-buoy bearing N., distant 200 yards, steer W. by S.; pass about midway between The Black Rocks and The Sisters, keeping Whale's Back, the eastern point at entrance to the river, on the starboard bow. Pass about 350 yards south of Whale's Back, and then steer NW. by W. ¾ W. for Pond Island light. When the southern end of Pond Island is in range with the southern end of Wood Island, the island to the westward, steer about N NW. ¾ W. and follow the directions in Section 2.

Remarks.—On the SW. by W. ¼ W. course from Ram Island light The Cuckolds will be on the starboard bow; Seguin Island will be seen in the distance a little on the starboard bow. On the W. by S. course Sheepscot River will be open to the northward. The course leads about midway between The Sisters, three low bare rocks on the port hand, and The Black Rocks, two low bare rocks, and a third rock awash at high water, on the starboard hand. There is sometimes a strong current setting out of Sheepscot River. The **Whale's Back**, a bare, rocky islet on the eastern side of the entrance to the river, and nearly ⅜ mile to the eastward of Pond Island, will be on the starboard bow. When nearly up to The Sisters, Pond Island light will be seen between Salter's Island and Whale's Back, the latter being to the southward of the light. On approaching Whale's Back the hotels on the western side of the entrance will be seen, and Sagadahoc Bay and Heal's Eddy will be opened to the westward of Whale's Back. The fog-bell structure on Pond Island shows conspicuously on the eastern side of the island.

Dangers.—The Cuckolds are described under heading "Sailing Directions, Sheepscot River to Wiscasset," Section 1. The Sisters, Tom's Rock, and The Black Rocks are described under the same heading, Section 1 A.

Shoal water extends about 100 yards to the southward from Whale's Back. There is a spot with 19 feet over it about 400 yards E. from the southern end of Pond Island, on a line drawn from the southern end of Whale's Back to the southern end of Pond Island.

Four Fathom Rock, with 3½ fathoms over it, lies 550 yards E. ¾ N. from Pond Island light-house; it is left on the starboard hand when entering.

1 A. ***Approaching and Entering.—From the Eastward.***—Passing about 2¼ miles south of Damiscove Island, bring Seguin light to bear W. by N. and steer for it on this bearing, passing about ¾ mile N. of the whistling-buoy off Bantam Rock. When Pond Island light bears NW. by W. steer for it on this bearing, passing a little over ¼ mile to the southward of Tom's Rock buoy, and about 400 yards to the northward of White Ledge buoy. When Whale's Back is on the starboard beam steer NW. ¼ W. for the northern end of Pond Island, and when the southern end of Pond Island is in range with the southern end of Wood Island, the island to the westward, steer about N NW. ¾ W. and follow the directions in Section 2.

Remarks.—The W. by N. course leads south of all dangers, except the small ledge just to the northward of the whistling-buoy off Bantam Rock, on which there is 4 fathoms. On the NW. by W. course for Pond Island light the entrance of the river will be opened and Salter's Island and Whale's Back will be on the starboard bow. At low water several bare ledges will be seen to the northward of Seguin Island.

1 B. ***Approaching and Entering.—From the Southward, passing East of Seguin Island.***—Keep Seguin light bearing to the westward of N. and steer for it, taking care to pass to the eastward of Mile Ledge and at least ½ mile to the eastward of the light. When the light bears W., steer N NE. ½ E. until Pond Island light bears NW. by W. Steer for Pond Island light on this bearing until Whale's Back is on the starboard beam, distant nearly 450 yards, when steer NW. ¼ W. for the northern end of Pond Island. When the southern end of the island is in range with the southern end of Wood Island, the island to the westward, steer about N NW. ¾ W. and follow the directions in Section 2.

Remarks.—As soon as Pond Island light is made it should be brought to bear NW. by W., taking care, however, not to bring Seguin light to bear to the southward of SW. before Pond Island light is on the bearing. If Pond Island light is brought on the bearing when it is about 3 miles distant, the NW. by W. course will lead nearly ⅜ mile south of Tom's Rock buoy; the hotels on the western side of the entrance will be seen over Pond Island and to the northward of it. When Whale's Back is nearly abeam, **Fort Popham**, an unfinished granite structure, will be opened to the westward of the Sugar Loaf Islands.

Dangers.—Tom's Rock and The Sisters are described on page 134.

Mile Ledge is described on page 25. When passing between the ledge and the southern end of Seguin Island give this buoy a berth of 500 yards.

Ledges make out over ⅛ mile in places from the eastern shore of Seguin; to avoid them give the eastern shore of the island a berth of at least ¼ mile.

Seguin Ledges, some showing bare, lie about ⅝ mile **N NE. ¾ E.** from the northern end of Seguin Island. The bare heads of the ledges are surrounded by shoal water, and should be given a berth of over 300 yards.

White Ledge has a least depth of 6 feet over it and lies 1 mile **N NE. ¾ E.** from the northern end of Seguin and about 1 mile **SE. ¾ S.** from Pond Island light-house. A buoy (spar, black, No. 1) is placed about 20 yards **E.** from the shoal part of the ledge. Vessels should not pass between this ledge and Seguin Ledges.

Four Fathom Rock and the 19-foot spot to the eastward of Pond Island are described under Section 1, preceding.

1 C. ***Approaching and Entering.—From the Westward.***—Steer for Seguin light on any bearing between **N.** by **E. ½ E.** and **E. ½ N.**, and pass about ⅜ mile to the westward of the island. When Seguin light bears **E.**, distant a little over ⅜ mile, steer **N NE.** until the bell-buoy † on Pond Island Bar is about 300 yards abaft the port beam; then steer **N. ¾ E.** until the southern end of Pond Island is in range with the southern end of Wood Island, the island to the westward, when change course to **N NW. ¾ W.** and follow the directions in Section 2.

Remarks.—Approaching Seguin light between the above bearings all the dangers off Small Point are avoided; Pond Island and light-house will be seen on the port bow 2 miles above Seguin. About 2½ miles **S SW. ½ W.** from Seguin light is a small 6-fathom spot known as **Seguin S SW. Ledge.** As the western side of Seguin Island is approached Ellingwood Rock and Seguin Ledges, lying to the northward and northeastward, will be seen, with the sea usually breaking over the latter. On the **N NE.** course Ellingwood Rock and Seguin Ledges are left well on the starboard hand; Whale's Back will be a little on the starboard bow, and the bell-buoy on the port bow. When abreast the bell-buoy and the course has been changed to **N. ¾ E.** the southern end of Stage Island will be ahead and Fort Popham will be opened to the northward of Pond Island.

Dangers.—**Fuller's, or Glover's, Rock** is a bare rocky islet about ¼ mile **S.** from Small Point. **Bill Wallace's Ground**, with a depth of 18 feet, lies nearly ½ mile west from Fuller's Rock and is not marked. **Button Mould Ledges**, with a depth of 11 and 16 feet, lie a little over ⅛ mile to the northwestward of Fuller's Rock, in the passage between the latter and Small Point. These dangers are surrounded by deep water, but it is not advisable to pass Small Point closer than ⅜ mile.

Halibut Rocks have a least depth of 4 fathoms over them and lie ⅝ mile **E.** from Fuller's Rock; they are not marked, and are avoided by keeping Seguin light bearing to the northward of **E. ¼ N.**

To the northward of the sailing line between Cape Small and Pond Island are a number of **small islands** and **sunken rocks** and **shoals.** **Jack Knife Ledge**, the farthest off shore, has a least depth of 8 feet and lies 1⅛ miles **SW. ¾ S.** from Pond Island light-house; it is marked by a buoy (nun, black, "J. K." in white letters) placed to the southward of the shoalest part of the ledge. Vessels should not pass to the northward of this buoy.

Ellingwood Rock, large and bare, lies about 400 yards **N.** from the northern end of Seguin; it should not be approached closer than 150 yards from the westward.

Seguin Ledges and **White Ledge** are described under Section 1 A; they are left on the starboard hand by vessels entering from the westward and should not be approached nearer than 400 yards.

Pond Island Bar is the name given to the shoal which lies to the southward and southwestward of Pond Island. It has depths ranging from 5 to 19 feet over it, and in heavy gales is covered with breakers. A buoy (bell, black)† marks the southeastern end of the bar and bears **S. ½ E.**, distant nearly ⅔ mile from Pond Island light-house. Vessels should not pass between this buoy and Pond Island.

A spot with 22 feet of water over it lies on the eastern side of the sailing line, ⅝ mile **SE.** from Pond Island light-house.

Four Fathom Rock and the 19-foot spot east of Pond Island are described under Section 1, preceding.

2. ***From Pond Island to the anchorage off Parker's Head Village.***—When the southern end of Pond Island, distant about ¼ mile, is in range with the southern end of Wood Island, the island to the westward, steer about **N NW. ¾ W.**, leaving Pond Island Rock buoy on the port hand and passing about 150 yards to the westward of South Sugar Loaf; then bring Pond Island light to bear **S.** by **E. ¼ E.** astern, and steer **N.** by **W. ¼ W.**, keeping the bearing. Pass about 150 yards to the eastward of Fort Popham and steer about **N.** for Cox's Head, leaving Shag Rock about 200 yards on the starboard hand. Leave Cox's Head about 150 yards on the port hand and steer about **N.** by **E.** and anchor on the eastern side of the channel in 6 to 7 fathoms water south of Perkin's Island South Ledge buoy (spar, red and black horizontal stripes), about ½ mile above Cox's Head.

Caution.—The velocity of the tidal currents above Pond Island is considerable, especially the ebb during spring tides and freshets. The courses are affected to such a degree by the currents that it is advisable for strangers in sailing vessels to take a pilot or tow-boat at Pond Island.

Remarks.—On the **N NW. ¾ W.** course Fort Popham will be a little on the starboard bow and the steamboat landing and life-saving station on Hunniwell Beach a little on the port bow. The **South Sugar Loaf**, a bare, rocky islet, will be left on the starboard hand.

† Replaced by a can-buoy (black) in the winter.

On the **N.** by **W.** ¼ **W.** course, with Pond Island light astern, Fort Popham will be on the port bow and Gilbert's Head, on the east side of the entrance, will be on the starboard bow. **North Sugar Loaf**, a bare, rocky islet, should be left about 150 yards on the starboard hand. The sailing line leads about midway between Fort Popham and Gilbert's Head.

On the **N.** course, when heading for the eastern end of Cox's Head, **Shag Rock**, a small bare rock, will be on the starboard bow, and is left 200 yards on the starboard hand. After passing this rock the course is a little more to the eastward, heading for Perkins Island South Ledge buoy. The water shoals abruptly from 4 fathoms to 6 feet on the eastern side of the channel.

Dangers.—**Pond Island Rock**, with 18 feet of water over it, lies 400 yards **N.** by **E.** ¼ **E.** from Pond Island lighthouse; it is marked by a buoy (spar, red and black horizontal stripes) placed near the rock. There is deep water around the rock, but a ledge makes out about 50 yards to the northward from the northern end of Pond Island.

Ledges make off about 100 yards to the southward and eastward from South Sugar Loaf. **Jack's Rock**, off the northeastern side of the islet, is marked by a spindle (iron, black, cage on top).

Ledges make off about 175 yards to the southward from North Sugar Loaf, and about 125 yards to the northwestward from it.

The water shoals abruptly on the western side of the channel when approaching the beach, which is hard sand.

The bight between Hunniwell's Point and Cox's Head is full of flats, which are mostly bare at low water.

Shag Rock is a small, bare rock on the eastern side of the channel ¼ mile **SE.** by **S.** from Cox's Head. The rock is nearer the southern end of the ledge which surrounds it and is 250 yards long in a **N.** and **S.** direction, and about 80 yards wide.

Perkins Island Ledges are two rocks lying in the channel to the southeastward and eastward of Parker's Head Village. **Perkins Island South Ledge** has a depth of 11 feet over it, and lies in mid-channel about ¼ mile below Perkins Island; it is marked by a buoy (spar, red and black horizontal stripes) placed to the southward of the ledge. **Perkins Island North Ledge** is in mid-channel east of Parker's Head Village and abreast of Perkins Island; it has 7 feet of water over it and is marked by a buoy (spar, black, No. 1) placed southeast from its shoalest part.

Shoal water makes out about 250 yards to the southward from Perkins Island. Between this and Perkins Island South Ledge the channel is about 200 yards wide.

The bight in the west shore to the southward of Parker's Head is full of flats, mostly bare at low water. A narrow channel, with about 9 feet of water, leads from the deep water of the river to Parker's Head Village.

CASCO BAY.†

This bay lies between and to the northward of Cape Small on the east and Cape Elizabeth on the west, between which points it is 17 miles wide and extends to the northward about 12 miles. The shores present a very irregular outline, being indented by numerous sounds, bays, rivers, and coves, separated by islands and much obstructed by rocks and ledges; the general trend of the islands and indentations is about **NE.** and **SW.** Portland Harbor, in the western shore, has a large foreign and coastwise trade (see heading, "Portland Harbor"); the other waters are mostly frequented by fishermen and small vessels plying from Portland to the towns and villages on the islands and shores of the bay. Small steamers from Portland run as far east as Orr's Island, in Harpswell Sound, stopping at intermediate landings among the islands and at Potts Harbor. The part of Casco Bay between Cape Small and the entrance of Merriconeag Sound is full of small islands and dangerous ledges and rocks, between which narrow but deep channels lead to the waters to the northward. Strangers should not attempt to enter this part of the bay without a pilot.

To the westward of Merriconeag Sound the channels leading into the bay are broader and have fewer obstructions, the most dangerous of which are marked by buoys or spindles. Strangers can easily avoid these dangers by using the chart and by closely following the directions in this volume. **Seguin Light** (see table of lights, page 112) is 3½ miles east of **Cape Small**, the eastern point at entrance to the bay, and is a guide to it from the eastward. **Halfway Rock light** (see table of lights, page 112) lies about in the middle of the entrance to the bay. **Cape Elizabeth lights, Portland Head light**, and **Portland Breakwater light** (see table of lights, page 112) are on the western shore of the bay and are guides for Portland Harbor. Strangers bound into Casco Bay generally take a pilot, usually some fisherman found off the entrance; the only regular pilots in this vicinity are for Portland Harbor.

Small Point Harbor is on the western shore of Cape Small, about 2 miles to the northward of **Bald Head**, the southwestern point of Cape Small; it lies to the eastward of Wood Island and is open to the southwestward. It is seldom used as an anchorage except by fishermen; the principal dangers are marked, but the holding ground is poor. The village of **Small Point** is at the head of the harbor.

Watering Place Cove is a small hight to the eastward of Burnt Coat Island, in the western shore of Cape Small, a little over 2¾ miles to the northward of Bald Head. It has a narrow channel with a least depth of 19 feet at low water, marked by three buoys. There is an ice wharf and store on the eastern shore of the bight where vessels load ice.

Horse Island Harbor is a small but good anchorage, with 8 to 30 feet of water, on the eastern shore of the bay, about 3¼ miles north of Bald Head; it lies between Horse Island and the mainland and is frequently used as a harbor of refuge by small craft.

† Shown on Coast and Geodetic Survey charts: **315**, scale $\frac{1}{40,000}$, price $0.25; and **106, 107**, scale of each $\frac{1}{80,000}$, price of each $0.50.

Ridley's Cove is to the eastward of Yarmouth Island and just to the westward of the entrance to New Meadows River. It has good anchorage in 5 to 7 fathoms water but is exposed to southerly and southwesterly winds. Strangers should not attempt to enter without a pilot on account of numerous ledges and rocks which lie off the entrance. There is a narrow deep channel leading from its northern end into Hen Cove and Quohog Bay.

Hen Cove is north of Ridley's Cove, and on the eastern side of Quohog Bay.

Quohog Bay is a narrow arm extending about 4 miles in a **NE.** by **N.** direction; it is seldom entered by strangers. Numerous unmarked ledges and many small islands lie off its entrance, which is between Yarmouth Island and ledges on the east, and Long Point on the west, and bears **N NW. ¾ W.** 5 miles from Bald Head.

The Gurnet is an unimportant arm making in 2 miles **NE.** by **E.** on the east side of Orr's Island and just to the westward of Quohog Bay; it is only used by fishermen and a few vessels, of 12 to 14 feet draught, that load ice near its head.

Lowell's Cove is a small cove in the southern end of Orr's Island and west of The Gurnet. **Horse Cove** is a small cove in the north shore of Bailey's Island.

Potts Harbor lies to the northward of the islands forming the western side of entrance to Merriconeag and Harpswell sounds, and is a large, irregular bight in the southern end of Harpswell Neck; it is a good anchorage with 3¼ to 5½ fathoms of water, but of little commercial importance. A few vessels, laden with coal, and the daily steamer from Portland are about the only vessels, other than fishermen, that enter here. There are two entrances to the harbor; the eastern one, from Merriconeag Sound, leads between Potts Point and Haskell Island, and is narrow and crooked with very strong tidal currents; it is unfit for a sailing vessel, and only persons having a knowledge of the locality and acquainted with the set of the currents should enter this way. The western entrance, between Upper Flag Island and Horse Island, is straight and about 225 yards wide at its narrowest part. Both of these channels are marked by buoys. On the eastern shore of the harbor is the village of **South Harpswell.**

Broad Sound is one of the approaches to Potts Harbor from the southward and westward, and the eastern approach to the part of Casco Bay lying west of Harpswell Neck and including the towns of Freeport and Yarmouth; it is also the eastern entrance to the inside passage to Portland. The entrance to the sound is between Eagle Island and W. Brown Cow, and lies 3 miles **N. ½ W.** from Halfway Rock light-house; its general direction is about **N.** by **E.** between the islands. The least water in the channel up to Whale Boat Island is 11 fathoms.

Middle Bay makes into the northeastward on the west side of Harpswell Neck, and lies to the eastward of the Goose Islands and Birch and Willie's islands; it is only used by fishermen and small vessels owned in the vicinity, although there is good water.

Mare Point Bay, shallow and obstructed by flats, lies between Birch and Willie's islands on the east, and Mare Point Neck on the west, and is separated from the upper part of Middle Bay by the two islands.

Maquoit Bay makes in to the northeastward on the western side of Mare Point Neck, the entrance lying north of the Goose Islands. It is obstructed by flats, with 1 to 4 feet of water over them, through which a channel with 19 to 24 feet water leads up for a distance of 2¼ miles from its entrance.

Luckse's Sound is an approach from the westward to Potts Harbor, Middle, Mare Point, and Maquoit bays, and to the town of Freeport; it leads to the northeastward between Crotch Island on the east, and Long and Hope islands on the west. The channel is well defined and can be easily followed; there are few unmarked dangers. The entrance lies 7¼ miles **NE. ½ N.** from Cape Elizabeth light-houses, and just to the northward of Outer Green Island and Junk of Pork Rock.

Chandler's Cove is formed by a bight in the southwestern end of Great Chebeag Island and by Little Chebeag Island; it is a good anchorage with 5 to 10 fathoms water, but is little used. The entrance from the eastward is through Luckse's Sound and between the northeastern point of Long Island and **Deer Point,** the southeastern point of Great Chebeag Island. The western entrance, between the north end of Long Island and the south end of Little Chebeag Island, is somewhat obstructed by rocks which are marked by buoys.

Broad Cove is a large shallow cove in the northwestern part of Casco Bay; there is good anchorage in the middle of the cove, southwest of Prince's Point, in 15 to 17 feet of water; it is open to the southward and eastward.

Mussel Cove is a small shallow cove in the western shore of the bay about 2 miles to the southwestward of Broad Cove.

Hussey's Sound is one of the principal channels into the western part of Casco Bay; it leads from the southward between Long Island on the east and Peak's Island and Great Diamond Island on the west. The least water in this sound is about 11 fathoms with the exception of one small spot about midway between Long and Peak's islands, where there is 28 feet with deep water all around it.

Presumpscot River, on the western shore of the bay, is north of the city of Portland. Its entrance is between Mackey's Point on the east and Martin's Point on the west; the **U. S. Marine Hospital** is situated on the latter point. The channel is narrow, crooked, and shallow, and is crossed by a bridge from Mackey's Point to Martin's Point. Vessels passing up the river take a tow-boat at Portland.

Pilots.—Strangers bound into Casco Bay and the adjoining waters generally take a pilot, usually some fisherman found off the islands. Vessels from the eastward sometimes signal off Small Point Harbor for a pilot; one can always be had there for the waters to the northeastward of Halfway Rock. Vessels from the westward take a pilot

off Portland, or, standing into Hussey's or Luckse's sounds take one from some one of the islands in the bay if a fisherman is not found outside.

Tow-boats.—Vessels bound into the bay, when coming from the eastward, sometimes take a tow-boat near Seguin Island, or when coming from the westward take one off Portland Harbor. They can usually be found in the mouth of the Kennebec River and off Portland Head.

Supplies.—Provisions can be obtained at Small Point Harbor, Cundy Harbor, Potts Harbor, Freeport, and nearly all the ice-house wharves. Water has to be taken in casks from wells or ice ponds.

Repairs.—There are no facilities for repairing vessels except at Portland (see heading "Portland Harbor").

Ice.—Considerable ice forms at the heads of the numerous arms extending to the northward in Casco Bay, but the principal anchorages are available at any season of the year.

Currents.—The tidal currents are not strong, but on the flood there is a perceptible set to the northward and on the ebb to the southward in the bay and across the entrance.

Tides.—The mean rise and fall of tides in the bay is about 9 feet. See table, page 116.

SAILING DIRECTIONS, CROSSING CASCO BAY OUTSIDE OF HALFWAY ROCK TO PORTLAND HARBOR ENTRANCE.

1. ***From the Eastward.***—From a position about ½ mile to the southward of Bantam Rock red whistling-buoy steer **W. ⅜ N.** about 24½ miles, passing about 1¾ miles to the southward of Seguin light. Leave Small Point about 1¾ miles on the starboard hand and pass about ½ mile to the southward of Halfway Rock light, and between it and the red whistling-buoy; Portland Head light should be made ahead. Pass about ⅜ mile to the southward of Ram Island Ledge tripod (wooden, red, 50 feet high, partly boarded), and when the beacon bears **NE.**, steer **NW.** by **W.** and follow the directions in Sections 1 and 2 "Sailing Directions, Portland Harbor."

Remarks.—Mile Ledge Buoy (can, red and black horizontal stripes) will be made a little on the starboard bow and left about ¾ mile on the starboard hand when south of Seguin Island.

Lumbo's Ledge buoy (spar, red and black horizontal stripes) will be made on the starboard bow and left about 1¼ miles on the starboard hand when about 4½ miles to the westward of Small Point. Halfway Rock light will be made a little on the starboard bow, and the red whistling-buoy on the port bow. When to the westward of Halfway Rock **Outer Green Island**, small, bare, grassy island, and **Junk of Pork**, small bare rock, will be made on the starboard bow and left about ⅝ mile distant. The two spar-buoys, marking Green Island Passage, one red and the other black, will be made a little to the northward and eastward of Outer Green Island, and left about 1 mile on the starboard hand. Witch Rock buoy (nun, red, "W. R." in white letters) will be made a little on the port bow, and left about ⅝ mile on the port hand. Ram Island Tripod will be made on the starboard bow, and left about ¼ mile on the starboard hand.

At night Seguin light should be on the starboard bow when abreast the whistling-buoy, and Pond Island light will be seen to the northward of Seguin. Halfway Rock light should be made a little on the starboard bow when Seguin light bears about **NW.** When abreast Cape Small, Cape Elizabeth lights should be made on the port bow, and shortly afterwards Portland Head light should be made ahead and to the southward of Halfway Rock light. Seguin light should be in sight on the starboard quarter until nearly up to Portland Head.

Dangers.—**Mile Ledge**, with 10 feet of water on it, lies 1 mile **S. ½ W.** from Seguin Island light-house. It is marked on its southern side by a buoy (can, red and black horizontal stripes). There is a passage with good water between the ledge and Seguin Island by giving the buoy a berth of 500 yards.

Flat Ground, or **Temple's Ledge**, has a least depth of 5 fathoms on it and lies 1¾ miles **SW. ¾ W.** from Bald Head and about 2⅛ miles **W. ¾ S.** from Fuller's Rock; it can be avoided by keeping Halfway Rock light bearing to the northward of **W.** The sea breaks on this ledge in heavy weather.

Lumbo's Ledge is about ⅞ mile long in a general **E NE.** and **W SW.** direction, and lies just to the northward and nearly midway on a line from Small Point to Halfway Rock. At its southwestern end is a spot with 9 feet over it, marked by a buoy (spar, red and black horizontal stripes), which bears **E. ½ N.** about 4¾ miles from Halfway Rock light-house. The depths on the ledge to the northeastward of the buoy range from 5 to 13½ fathoms.

Bulwark Shoal, with 14 feet on it, and lying 3½ miles **SW. ¾ S.** from Halfway Rock light-house, is marked on its southeastern side by a buoy (nun, red and black horizontal stripes). This danger and the rocks and shoals lying southward and westward of it can be avoided by keeping Portland Head light bearing to the westward of **W NW. ¼ W.**

Outer Green Island, Junk of Pork, and the rocks and reefs to the northward and eastward of them can be avoided by keeping Portland Head light bearing to the westward and northward of **W. ½ S.**

Witch Rock, with 4 fathoms on it, is marked by a buoy (nun, red, "W. R." in white letters) placed 100 yards southeast of the rock and lying 1⅝ miles **E.** by **S.** from Portland Head light-house. See also "Dangers," Section 1, "Sailing Directions, Portland Harbor."

Ram Island Ledge, bare at low water, makes in a southerly direction for a little over ¼ mile from Ram Island. It is marked on its southern end by a beacon (wooden tripod, 50 feet high, partly boarded from the top), which bears **E NE. ¾ E.**, distant 1 mile from Portland Head light-house.

Jordan's Reef (Bell Rock), with 22 feet of water on it, lies 1 mile **SE.** by **E.** from Portland Head light-house, and is marked by a buoy (nun, red and black horizontal stripes) placed 50 yards southeast of the reef.

SAILING DIRECTIONS, CROSSING CASCO BAY INSIDE THE ISLANDS.

The following directions, if closely followed, are good for a draught of 12 feet. A draught of 20 feet may be taken into Portland Harbor inside of the islands, but some local knowledge and a favorable tide are necessary. Strangers should only use this passage in the daytime with clear weather.

1. *From the Eastward.*—From a position about $\frac{7}{8}$ mile S. of Small Point, the southern end of Cape Small, steer **W NW.** for Little Mark Island monument (square stone tower, 50 feet high, black and white perpendicular stripes). When about $\frac{1}{2}$ mile from the monument haul to the northward a little, then continue the **W NW.** course and pass about 225 yards north of the monument. Leave red spar-buoy No. 4 on the starboard hand and steer about **NW.**, so as to leave black spar-buoy No. 3 on the port hand. Continue the **NW.** course until the northern end of Eagle Island is abeam, bearing **SW.**, then steer **NW.** $\frac{3}{4}$ **W.** Leave Stave Island Ledge buoy (spar, black, No. 5) about 50 yards on the port hand, and when it bears **S.** steer **W.** $\frac{1}{2}$ **S.** for Sand Island Ledge buoy (spar, black, No. 7). Pass about 200 yards to the southward of Little Bangs Island and 50 yards to the northward of black spar-buoy No. 7. Continue the **W.** $\frac{1}{2}$ **S.** course about 250 yards beyond buoy No. 7, and then steer **W SW.** for the northeastern end of Long Island, and proceed as directed in Section 2, following.

Remarks.—When south of Small Point, Fuller's or Glover's Rock will be in range with it, and distant about $\frac{5}{8}$ mile. On the **W NW.** course Lumbo's Ledge buoy (spar, red and black horizontal stripes) will be left about 1 mile on the port hand. **Jaquish Island**, the southernmost of the islands at the eastern side of the entrance to Merriconeag Sound, with bare rocky ledges lying about 150 yards to the southward and eastward of it, will be made on the starboard bow and left $\frac{5}{8}$ mile on the starboard hand. **Turnip Island**, small and bare, will be opened out to the northward and westward of Jaquish Island. Turnip Island Ledge buoy (spar, red, No. 2) will be left $\frac{1}{4}$ mile on the starboard hand. Mark Island Ledge buoy (spar, black, No. 1) will be on the port bow, and left $\frac{5}{8}$ mile on the port hand. When abreast this buoy Merriconeag and Harpswell sounds will be open to the northward.

Passing north of Little Mark Island, on the **W NW.** course, **Haddock Rock**, a rocky islet surrounded by ledges, will be ahead, and **Eagle Island**, surrounded by ledges and thickly wooded, will be on the port bow. The **NW.** course leads about 200 yards to the northeastward of Haddock Rock, and about 600 yards to the northward of Eagle Island.

On the **NW.** $\frac{3}{4}$ **W.** course **Bates** and **Ministerial islands**, mostly bare, the latter wooded near its center, will be on the port bow, and the western entrance to Potts Harbor, marked on its southern side by a red and black horizontal striped spar-buoy and on its northern side by red spar-buoy No. 8, will be opened out on the starboard beam; Little Bangs Island will be ahead, and Stave Island Ledge buoy should be a little on the port bow.

On the **W.** $\frac{1}{2}$ **S.** course black spar-buoy No. 7 will be a little on the port bow, and red spar-buoy No. 6, beyond it, will be ahead. **Little Bangs Island**, with a bluff about 30 feet high and covered with spruce on the southwestern end, will be on the starboard bow and left about 200 yards on the starboard hand.

Dangers.—**Bill Wallace's Ground**, with 18 feet on it, **Button Mold Ledges**, with 11 feet on them, **Bald Head Ledge**, bare at half tide and marked by a red iron spindle, lie $\frac{5}{8}$ to $\frac{1}{2}$ mile to the southward of Cape Small and to the westward of Fuller's Rock. They can be avoided by giving the shores of Cape Small a berth of at least $\frac{5}{8}$ mile.

Flat Ground or **Temple's Ledge** is described on page 143.

Lumbo's Ledge, with 9 feet on it, is described on page 143.

E. Brown Cow is a small, bare island, bold-to on all except its northern side, lying $1\frac{1}{2}$ miles **W NW.** $\frac{1}{4}$ **W.** from Bald Head. The **W NW.** course leads $\frac{5}{8}$ mile to the southward of it.

Bold Dick is a small, bare rock, with good water 200 yards from it on all sides; it lies $2\frac{1}{8}$ miles **W NW.** from E. Brown Cow.

Saddleback Ledge and **Round Rock**, unmarked ledges awash at low water, lie from $\frac{1}{4}$ to $\frac{5}{8}$ mile to the northward and northwestward of Bold Dick. They can be avoided by giving Ragged Island a berth of over $\frac{5}{8}$ mile.

Jaquish Island has ledges and bare rocks making out about 350 yards to the southward and southeastward from it; they may be avoided by keeping Little Mark Island monument bearing to the northward of **W.** by **N.**

An unmarked 16-foot spot lies $\frac{3}{4}$ mile **S SW.** $\frac{1}{2}$ **W.** from the southwestern end of Jaquish Island. It can be avoided by keeping Little Mark Island monument bearing to the westward of **NW.** by **W.** There is a 19-foot spot 550 yards **S.** by **W.** from the southern end of Jaquish Island.

Turnip Island Ledge, bare at low water, lies $\frac{3}{4}$ mile **E.** $\frac{1}{4}$ **S.** from Little Mark Island monument. It is marked on its southwestern side by a buoy (spar, red, No. 2).

Mark Island Ledge, a detached ledge with 3 feet of water on it, lies $\frac{3}{4}$ mile **S SE.** $\frac{3}{4}$ **E.** from Little Mark Island monument. It is marked on its western side by a buoy (spar, black, No. 1). The ledge is about 300 yards long **N.** and **S.** and about 200 yards wide.

Ledges make off about 100 yards to the northward from Little Mark Island and about 300 to the southwestward from **Great Mark Island**—the small island $\frac{5}{8}$ mile **NE.** by **N.** from the monument. The channel between these ledges is about 250 yards wide.

Ledges make off about 200 yards to the southward and westward from the southern point of **Haskell Island.** They are marked near their southern edge by a buoy (spar, red, No. 4).

Haddock Rock is surrounded by ledges which are marked at their northeastern edge by a buoy (spar, black, No. 3).

Ledges obstruct the entrance to Potts Harbor between Haskell and Upper Flag islands.

Ledges make off 350 yards to the northeastward from Eagle Island, and about the same distance to the southwestward from Upper Flag Island, leaving the channel between these islands about ¼ mile wide.

An unmarked 15-foot spot lies 400 yards **E. ½ S.** from the northern end of Ministerial Island.

Stave Island Ledge, bare in places at low water, extends ¼ mile **NE.** from the long, rocky point on the northeastern end of Stave Island. It is marked on its end by a buoy (spar, black, No. 5).

Sand Island Ledge extends ¼ mile **NE.** from Sand Island. It is marked on its northern end by a buoy (spar, black, No. 7). There is no safe passage between the buoy and the island.

2. ***From the Northeastern end of Long Island to Portland.***—After having passed 250 yards beyond black buoy No. 7, steer **W SW.** for the northeastern end of Long Island, giving Deer Point a berth of 200 yards, and Deer Point Rock buoy a berth of 100 yards on the starboard hand. When about 150 yards to the westward of the buoy, steer **N. ¾ E.** into Chandler's Cove. Leave Crow Island, low, grassy, with a few scattered trees, about 250 yards on the port hand, and steer **W. ½ N.** for the southern end of Little Chebeag Island; when the island is about 400 yards distant, steer **SW.** by **W.**, passing about midway between Little Chebeag and Long islands. Leave red spar-buoy No. 8 about 100 yards on the starboard hand and pass to the southward of red spar-buoy No. 10, giving it a berth of 50 yards, then steer **W. ¼ S.** Pass about 200 yards to the northward of Cow Island, and 300 yards to the northward of red spar-buoy No. 4, marking Brimstone Point Ledge. When this buoy bears **SE.**, distant about 400 yards, steer **SW.** for the Breakwater light, and pass close to the westward of red spar-buoy No. 2; when Fort Gorges bears **SE.** haul to the westward and stand in to Portland Upper Harbor, giving the wharves a berth of 200 yards. Anchor on the eastern edge of the channel, within the limits prescribed in the harbor regulations in Appendix II.

Remarks.—On the **W SW.** course red spar-buoy No. 6, marking Sand Point, will be left about 250 yards on the starboard hand. Hope Island, which is left on the port hand, is bold-to, and may be approached to 150 yards. The shore from Coleman's Cove to **Deer Point**, the southern point of Great Chebeag Island, is bold-to, and may be approached to 100 yards. The northeastern point of **Long Island** is low, grassy, with a water-line of whitish rocks; it is backed by a thick growth of trees; the end may be approached to 100 yards, but to the northward of this point shoals make out and connect Long Island with Crow Island. Standing for Little Chebeag Island, give Crow Island a berth of at least 150 yards. The northern end of Long Island should be given a berth of 150 yards. The western shore of Long Island should not be approached closer than 250 yards when to the southward of red buoy No. 10.

On the **W. ¼ S.** course Cow Island Ledge spindle (iron, black, cage on top) will be made on the starboard bow, and left about ½ mile on the starboard hand. **Cow Island** will be a little on the port bow; it is comparatively bold-to on its northern side, and may be approached to 150 yards. When abreast of Cow Island, Hog Island Ledge buoy (spar, red, No. 6), marking the western side of Cow Island Channel will be opened out and left about ¼ mile on the port hand. After passing red buoy No. 2, care should be taken not to let the Breakwater light bear to the southward of **SW.**

Dangers.—**Sand Point**, a point on the southeastern shore of Great Chebeag Island, bearing **W NW.** from the northern end of Sand Island, has a shoal with 3 feet over it, extending 150 yards to the southeastward. The eastern side of this shoal is marked by a buoy (spar, red, No. 6).

Deer Point Rock is small with 4½ feet of water over it, lying 250 yards **SW.** by **W.** from the southern end of Deer Point. There is a passage with 4¾ fathoms between the rock and Deer Point by giving the latter a berth of 150 yards. Strangers are advised to pass to the southward and westward of the buoy (spar, red and black horizontal stripes), which is placed about 100 feet **SE.** from the rock.

Little Chebeag Island Point makes out 200 yards in a southerly direction from the southern end of Little Chebeag Island. It is marked on its end by a buoy (spar, red, No. 8).

Channel Rocks with 9 feet of water on them, are three detached rocky spots extending in a north and south direction for nearly ¼ mile. They are marked by a buoy (spar, red, No. 10) placed close to the southward of the southernmost, and lying ⅜ mile **SW. ¾ S.** from the southern end of Little Chebeag Island.

Brimstone Point Ledge, makes out nearly ¼ mile in a **N NW.** direction from the northern end of Great Diamond Island. It is marked by a buoy (spar, red, No. 4) placed on its northern end; there is no safe passage between it and the island.

Hog Island Ledge is the shoal ground extending from the western shore of Diamond Island. Its extreme western end, which extends about 700 yards to the westward from the middle of the island, is marked by a buoy (spar, red, No. 2) lying 1 mile **NE.** from Fort Gorges. There is no safe passage between it and the island. The ledge on which Fort Gorges is built is also called **Hog Island Ledge.** It shows partly bare at low water and extends 400 yards in a westerly direction from the fort, and 600 yards in a northerly and easterly direction.

An extensive shoal extends for 1⅛ miles **S.** from **Mackey's Island**, the large Island lying 1⅜ miles **N.** from Fort Gorges, and contracts the channel between the 12-foot curves ¼ mile **N.** of Fort Gorges to 200 yards.

NEW MEADOWS RIVER

makes into the northeastern part of Casco Bay, and is of little commercial importance except for ice, which is shipped during the season; its entrance is much obstructed by ledges and rocks, few of which are marked. Strangers

bound into the river should take a pilot, if coming from the eastward, at Small Point Harbor; if from the westward, signal should be made when off Halfway Rock, and while standing to the northeastward toward the entrance. Strangers seldom go above Long Island off the entrance to Winnegance Bay. The channel of the river is comparatively free from dangers and has a least depth of 6½ fathoms at low water to Foster's Point. At all of the ice wharves in the river, except at Birch Point, vessels lie aground at low water when loaded.

Cundy Harbor, in the west shore, about 1¼ miles above the mouth of the river, is a good anchorage with 3¼ to 5 fathoms of water, sheltered from all winds; the village of **Cundy Harbor** is on its western shore.

The Basin, a cove in the east shore, about 1¼ miles above Cundy Harbor, has a narrow entrance and is only used by small local craft.

Winnegance Bay, on the east shore about 1 mile above the basin and 7 miles above Bald Head, is a large bight with good anchorage in 3¼ to 4¼ fathoms of water, but is little used.

SAILING DIRECTIONS, NEW MEADOWS RIVER TO FOSTER'S POINT.

These directions are good for a draught of 20 feet; vessels of the deepest draught can enter, but are advised to take a pilot. Strangers should not attempt to enter except in the daytime with clear weather.

1. ***Approaching and to an anchorage in Cundy Harbor.—From the Eastward.***—Pass about ½ mile to the southward of Bantam Rock (red, whistling-buoy) and steer **W. ⅜ N.** When Seguin light bears **N.**, distant 1¾ miles, steer **W NW.**, passing about ½ mile south of Fuller's Rock. When Bald Head Ledge spindle bears **NE. by N.**, distant a little over ½ mile, steer **N. ½ W.** for the eastern edge of Flag Island, leaving Bald Head ½ mile on the starboard hand, and when the southern end of Wood Island bears **E.**, distant about ⅜ mile, steer **N. by E. ½ E.** Leave Jamison's Ledge spindle nearly ¼ mile on the port hand, and when **North Blacksnake**—bare, rocky islet at the entrance to Horse Island Harbor—bears **E.** steer **N. by W.** for the entrance to New Meadows River. When about midway between East Cundy Point and Bear Island steer **N. by E.** for the entrance to Cundy Harbor, and anchor in the middle of the harbor in 4 to 5 fathoms water, soft bottom.

Or, if wishing to go farther up the river, proceed as directed in Section 2, following.

Remarks.—Passing to the southward of Seguin Island, Mile Ledge buoy (can, red and black horizontal stripes) will be left about ¾ mile on the starboard hand. Fuller's or Glover's Rock, a bare, rocky islet about ¼ mile **S.** of Small Point, will be on the starboard bow and about ½ mile distant when in range with Small Point. Bald Head Ledge spindle (iron, red, 35 feet high, with cylindrical cage on top) will be seen nearly 1 mile **W NW.** from Fuller's Rock.

On the **N. ½ W.** course **Bald Head**, bare precipitous headland, the western point of Cape Small, and Gooseberry Ledge buoy (spar, red, No. 2) will be left about ½ mile on the starboard hand in the order named. **E. Brown Cow**, low bare island, and **Mark Island**, small and low, thickly wooded with stunted fir, will be on the port bow and left about ⅞ mile on the port hand. The village on the western shore of Small Point Harbor will be opened on the starboard hand. **Wood Island** is high and partly wooded on top, with bare white rocks appearing in places; it is about 1¾ miles **N. ¾ W.** from Bald Head and will be on the starboard bow. It should be given a berth of ¼ mile to avoid the shoals making out from its western side. **Flag Island**, low, flat and well wooded, lying 1⅜ miles **N NW. ¾ W.** from Wood Island, will be ahead.

On the **N. by E. ½ E.** course the buoys marking Watering Place Cove will be opened on the starboard bow when past Wood Island, and black buoy No. 1 at the entrance to the cove will be left about ¼ mile on the starboard hand when abreast of it. Jamison's Ledge spindle (iron, black, cage on top) will be made on the port bow and left about 350 yards on the port hand. **North Blacksnake**, bare rocky islet off the entrance to Horse Island Harbor, and ⅞ mile **E.** from Flag Island, will be on the starboard bow and left about 300 yards on the starboard hand when the course is changed to **N. by W.** On this course Goudy Ledge spindle (iron, red and black horizontal stripes) will be broad off the port bow and is left ¼ mile on the port hand. **Bear Island**, large, high and well wooded, at the eastern side of the entrance to New Meadows River, will be on the starboard bow, and the course for Cundy Harbor leads about midway between it and Fort Point on the western side of the entrance. The western shore above Fort Point to Cundy Harbor is comparatively bold-to, but should not be approached nearer than 200 yards. In Cundy Harbor favor the western shore, giving it a berth of 150 yards.

Dangers.—**Mile Ledge** is described on page 143.

Fuller's or **Glover's Rock** is described on page 140.

Button Mould Ledges and **Bill Wallace's Ground** can be avoided by keeping Fuller's Rock bearing to the northward of **E. ½ N.**, until more than ½ mile beyond it. They are described on page 140.

Bald Head Ledge, a very dangerous small ledge, bare at half tide, lies ⅝ mile **S. ¾ W.** from Bald Head. It is marked by a spindle (iron, red, 35 feet high, with cylindrical cage on top).

Gooseberry Island Ledge is about 250 yards long in a **N NE.** and **S SW.** direction, and partly awash at low water. It bears **N. ½ W.**, distant a little over ¾ mile from Bald Head, and is marked off its southwestern end by a buoy (spar, red, No. 2), which is also a guide for entering Small Point Harbor. Vessels should not attempt to pass to the eastward of the buoy.

Wyman's Ledge, unmarked detached ledge about 200 yards in diameter, with 4 feet of water on it, lies $\frac{5}{8}$ mile **E SE. $\frac{3}{4}$ E.** from the southern end of Mark Island, and nearly $\frac{3}{4}$ mile **N NE. $\frac{1}{4}$ E.** from E. Brown Cow. The sailing line passes about $\frac{1}{2}$ mile to the eastward of this danger.

An unmarked **16-foot rock** lies 600 yards **S.** by **W. $\frac{1}{2}$ W.** from the southern end of Wood Island. This Island also has ledges making 200 yards in a southerly and westerly direction from its southern end.

Chivers Ledge, unmarked, with $6\frac{1}{2}$ feet of water on it, lies $\frac{1}{3}$ mile **NE.** by **E.** from the northern end of Mark Island. This island also has a ledge making out 300 yards in a northerly direction from its northern side. Vessels should not pass between Chivers Ledge and Mark Island.

A **small unmarked ledge**, with 6 feet of water over it, lies nearly $\frac{1}{4}$ mile **N NW. $\frac{1}{4}$ W.** from the northern end of Wood Island. To the northeastward of this ledge shoals make out from the southern end of Carrying Place Head in a westerly direction about 200 yards. Vessels should pass at least $\frac{1}{4}$ mile to the westward of the southern end of Carrying Place Head to avoid these ledges.

Jamison's Ledge, bare at low water near its southern end, extends for $\frac{5}{8}$ mile in a **N.** by **E.** and **S.** by **W.** direction. It is marked by a spindle (iron, black, cage on top) placed on its southern end and lying $\frac{1}{2}$ mile **E SE.** from the southern end of Flag Island.

Flag Island Ledge, bare at low water, lies about midway between Jamison's Ledge and Flag Island. Strangers should pass to the eastward of Jamison's Ledge.

South Point of **Burnt Coat Island Ledge** makes out 300 yards in a **SW.** direction from the southern end of Burnt Coat Island. It is marked on its end by a buoy (spar, black, No. 1).

An unmarked **18-foot spot** lies 150 yards **S.** from the southern end of North Blacksnake.

Detached unmarked **ledges** extend for $\frac{5}{8}$ miles in a general **NE.** by **N.** direction from the northern end of Flag Island. The northernmost, with 15 feet of water on it, lies 650 yards **E SE.** from the red and black horizontal striped spindle marking Goudy Ledge.

Horse Island, the large island **N.** by **E.** from North Blacksnake, has ledges making out 400 yards from its southern and western side. There are also rocky spots with 14 feet on them obstructing the entrance of the bight to the northward of Horse Island, between it and Bear Island.

Goudy Ledge, bare at half ebb, is marked by a spindle (iron, red and black horizontal stripes) placed on the southwest end of the ledge and lying $\frac{5}{8}$ mile **N.** by **E.** from the northern end of Flag Island.

Bear Island has a ledge making out 300 yards in a **S SW.** direction from its southern end. Ledges also make out about 200 yards from its western side.

1 A. ***Approaching and to an anchorage in Cundy Harbor.—From the Westward.***—When Halfway Rock light is made stand for it; pass it about $\frac{1}{2}$ mile on either hand and bring it to bear **W SW. $\frac{1}{4}$ W.** and steer **E NE. $\frac{1}{4}$ E.** for Mark Island. When the southern end of White Bull comes in range with the western side of Ragged Island, bearing **NW.**, steer **N NE. $\frac{3}{4}$ E.** for Goudy Ledge spindle. Pass midway between Long Ledge and Flag Island, and when 400 yards distant from the spindle steer so as to give it a berth of 150 yards on either hand, and when 400 yards beyond it bring it to bear **S SW.** and steer **N NE.** When the entrance to Cundy Harbor is opened haul a little more to the northward and follow the western shore, giving it a berth of about 200 yards. Anchor in the middle of the harbor in 4 to 5 fathoms.

Or, if wishing to go up the river, proceed as directed in Section 2, following.

Remarks.—On the **E NE. $\frac{1}{4}$ E.** course **Mark Island** will show ahead as a low rocky island well wooded with stunted fir, and **E. Brown Cow**, bare rocky islet, on the starboard bow, to the southward of it. **White Bull**, a bare, white looking, rocky islet, will be on the port bow open to the westward of Mark Island. **Ragged Island** will show on the port bow, to the northwestward of White Bull, as a rocky island with a steep bluff on the southeastern end, its summit covered with stunted fir. The **N NE. $\frac{3}{4}$ E.** course for Goudy Ledge spindle leads about midway between White Bull and Mark Island. **Flag Island**, small and wooded, will be a little on the starboard bow and **Long Ledge**, two bare islets, in range so as to appear as one, will be on the port bow; the course leads midway between Flag Island and Long Ledge. The **N NE.** course leads about midway between the western shore, at the entrance to the river, and Bear Island.

Dangers.—**Halfway Rock** should not be approached closer than $\frac{3}{8}$ mile so as to avoid the ledges making out to the northward and southwestward from it. **Webster Rock**, with 11 feet of water on it, is the name of the ledge that makes out to the northward from Halfway Rock. It is marked on its end by a buoy (spar, black, No. 1).

Lumbo's Ledge is described on page 143.

Bold Dick is a small bare rock, with good water as close as 200 yards from it, lying $\frac{3}{4}$ mile **SW. $\frac{1}{2}$ S.** from the southeastern end of Ragged Island. It can be avoided by keeping the southern end of Mark Island bearing to the northward of **E. $\frac{1}{4}$ N.**

Mark Island Ledge, small detached ledge, just covered at high water, lies $\frac{3}{8}$ mile **W. $\frac{1}{2}$ S.** from the southern end of Mark Island. An unmarked 17-foot rock lies 200 yards **S SE.** from this ledge.

Chivers Ledge is described under Section 1, preceding.

Sisters Ground, a group of shoals and detached ledges having from 5 to 18 feet on them, extend a little over $\frac{1}{2}$ mile in a southeasterly direction from **The Sisters**, two bare, rocky islets lying **NE.** by **E. $\frac{1}{2}$ E.** from the north end of **Ragged Island**; they can be avoided by keeping the eastern edge of White Bull bearing to the westward of **SW.** by **S.**

A detached, unmarked **ledge** lies in a northwesterly direction about 250 yards from the northern end of Flag Island.

For **Goudy Ledge** and **Bear Island** see "Dangers" under Section 1, foregoing.

North Jenny Ledge is about 400 yards long **N.** and **S.**, with 1 foot of water near its southern end; it lies ¼ mile **W NW.** ½ **W.** from Goudy Ledge spindle.

A shoal extends 200 yards to the southward from **Rogue Island**, the small bare island off the western point at entrance to the river.

East Cundy Point has a ledge making out 300 yards in a southeasterly direction from it and obstructing the bight to the northward of Rogue Island.

2. ***From Cundy Harbor Entrance to Foster's Point.***—When off the entrance to Cundy Harbor steer **NE.**; pass about midway between Sheep Island Ledge buoy (spar, black, No. 1) and the eastern shore. When the buoy bears abeam head about **N NE.** for *Birch Point,* the northern point at entrance to Winnegance Bay; then—

If wishing to enter Winnegance Bay, when the southern end of Long Island bears abeam steer **NE.** by **E.** ½ **E.** and anchor in the northern side of the bay.

If wishing to proceed up the river, when the southern point of Long Island bears abeam, distant about 350 yards, steer **N.** ½ **E.** for the eastern edge of Bragdon's Island, passing about midway between Birch Point and Long Island, and above Birch Point slightly favoring the eastern shore. When within ¼ mile of *Bragdon's Island*—the easternmost and largest of a group known as the *Three Islands*—haul a little more to the eastward and give Bragdon's Island a berth of 150 to 200 yards. When the northern end of the island bears **W.** steer about **NW.** ½ **N.** and follow the shore of Foster's Point, giving it a berth of 200 to 300 yards. Anchor in the channel abreast Foster's Point in 3¾ to 5½ fathoms water. If desiring to proceed farther up the river take a pilot.

Remarks.—Standing up the river above Cundy's Harbor, Sheep Island Ledge buoy (spar, black, No. 1) will be on the port bow, and should be left about 200 yards on the port hand. The eastern shore from ¼ mile to the northward of Bear Island to **Basin Point**, the southern point at entrance to Winnegance Bay, is bold-to, and may be approached as close as 100 yards. After leaving buoy No. 1, **Birch Point**, 60 feet high and well wooded except on its end, which is bare, will be ahead. Winnegance Bay will appear opened out to the southward and eastward of the point. The southern end of **Long Island** will show on the port bow a little open to the westward of Birch Point and will be about 350 yards on the port hand when the course is changed to **N.** ½ **E.** The eastern shore above Birch Point to opposite Bragdon's Island is bold-to, and may be approached to 150 yards, except in the small bights. Bragdon's Island is bold-to on its eastern side, and may be approached as close as 90 yards. Above Bragdon's Island the course should favor the eastern shore, as shoals make out to the northwestward of the island and obstruct the passage between it and the western shore, and also fill the bight between Indian Point and Bombazine Island.

Foster's Point is on the eastern shore of the river and bears about **N.** by **W.** ½ **W.** from the northern end of Bragdon's Island.

The anchorage in Winnegance Bay is over toward the northern shore to the eastward of **Jenny's Nubble**, the small rocky island off the northern point at entrance to the bay. The southern shore is foul and should be avoided.

Dangers.—**Cedar Ledges** are a group of bare rocks forming the northern point at entrance to Cundy Harbor; they extend about ⅜ mile in a **N NE.** ½ **E.** direction, and should not be approached closer than 100 yards from the eastward.

An unmarked **ledge**, awash at low water, makes out for ¼ mile in a **N NE.** direction from the northern end of Bear Island.

Sheep Island Ledge, with 2 feet of water over it, lies in the middle of the river about ⅝ mile **N.** by **E.** ½ **E.** from the northern end of Bear Island. It is about 225 yards long in a **NE.** and **SW.** direction, and marked by a buoy (spar, black, No. 1) placed off its southeastern end. This buoy should be given a berth of at least 150 yards when passing.

Hen Island Ledge, bare at low water, lies a little over ¼ mile from the southern shore of Winnegance Bay and nearly ¼ mile **W.** ¾ **S.** from **Hen Island**—the small bare islet, the southernmost of the two lying off the southern shore of the bay. These islands have extensive shoals extending to the eastward from them and should be left on the starboard hand when entering.

MERRICONEAG SOUND, HARPSWELL SOUND.

These waters are of no commercial importance, but they are the approach to one of the best anchorages in Casco Bay. The entrance lies 3¼ miles **N NE.** from Halfway Rock light-house (see table of lights, p. 112), and is marked on its western side by a stone monument on Little Mark Island. The sounds extend in a **NE.** direction 10 miles, and for the first 4 miles the prominent dangers are marked; above this strangers should not go without a pilot, as the channel is narrow, and flats make out some distance from the shores in several places. Vessels of the heaviest draught can enter and find anchorage in 3¼ to 10 fathoms of water, with good holding ground. If in the vicinity of Halfway Rock, and unable to beat into Portland against a northwesterly wind, this is the best harbor that can be made.

Mackerel Cove, in the southwestern shore of **Bailey's Island**, the eastern point at the entrance to Merriconeag Sound, is an excellent, though small, anchorage with 5 to 11 fathoms of water; it is open to the southwestward, but heavy seas never enter, and vessels can ride out any kind of weather. There are no dangers; the water shoals gradually toward its head. The entrance lies 1½ miles **E NE.** from the monument on Little Mark Island.

Opposite Mackerel Cove, on the western side of the sound, is the eastern entrance to **Potts Harbor**, leading between Potts Point and Haskell Island. The channel of this entrance is marked by buoys, but strangers should not attempt to enter it without a pilot, on account of the narrow channel and strong tidal currents.

Harpswell Harbor makes into the western shore about 3½ miles above the monument on Little Mark Island. This is an excellent, well sheltered anchorage, with 3¼ to 6 fathoms of water, shoaling gradually to the southwestward toward the head of the cove. Vessels occasionally come here for cargoes of ice.

On the eastern shore of the sound opposite Harpswell Harbor, at the southern end of Orr's Island, is **Orr's Island**, a small village which has steamboat communication with Portland. **Wills Straits**, just south of the village, is a narrow and dangerous passage separating Orr's and Bailey's islands.

SAILING DIRECTIONS, HARPSWELL HARBOR.

Following the directions in Section 1, a depth of 4½ to 5 fathoms will be found when about 1¼ miles to the eastward of Little Mark Island monument.

The directions in Section 1 A carry a least depth of 9 fathoms until up to the anchorage in Harpswell Harbor.

1. ***Approaching and Entering.—From the Eastward.***—Proceed as directed in Section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 144. When on the **W NW.** course and about ½ mile distant from the monument, steer **NE. ¾ N.** through Merriconeag Sound. Leave Turnip Island Ledge buoy (spar, red, No. 2) about ¼ mile on the starboard hand and Interval Shoal buoy (spar, black, No. 3) about 200 yards on the port hand. Pass midway between Cox's Ledge buoy (spar, red, No. 4) and Stover's Point buoy (spar, black, No. 5). When past the latter buoy haul to the northward and westward and anchor in Harpswell Harbor, in from 3¼ to 4½ fathoms, soft bottom.

Wishing to anchor in Mackerel Cove.—When, standing up Merriconeag Sound on the **NE. ¾ N.** course, Little Mark Island monument bears **W SW.**, bring it to bear astern and steer **E NE.** for the entrance to the cove. Give the western point at the entrance a berth of at least 150 yards, pass midway between the shores, and anchor about the middle of the cove in from 5 to 6¾ fathoms.

Remarks.—The "Remarks" and "Dangers" approaching Little Mark Island monument are given under "Sailing Directions, Crossing Casco Bay inside the islands," page 144. The western shore of Bailey's Island is comparatively bold-to, but should not be approached nearer than 200 yards. Standing up Merriconeag Sound black buoy No. 3 will be made a little on the port bow. The buoys marking the eastern entrance to Potts Harbor will be opened out to the northward of Haskell Island and left on the port hand.

Anchoring in Harpswell Harbor, Stover's Point black buoy should be kept bearing to the southward of **SE.** until about ¼ mile beyond it. There are no dangers in Mackerel Cove, the shores are bold-to, and may be approached as close to as 60 yards, except at its head and about half way along the eastern shore.

Dangers.—**Interval Shoal**, with 16 feet of water on it, and lying 2¼ miles **NE.** from Little Mark Island monument, is marked by a buoy (spar, black, No. 3) placed to the southeastward of it. There is no safe passage to the westward of this buoy.

Cox's Ledge, bare at low water, extends 450 yards **NE.** by **N.** from the northern end of Bailey's Island. It is marked on its end by a buoy (spar, red, No. 4) which is a guide for Orr's Island, and is left on the starboard hand by vessels bound to Harpswell Harbor.

Stover's Point Shoal, with 1 foot of water on it, makes out 300 yards to the northward from Stover's Point. It is marked on its northeastern end by a buoy (spar, black, No. 5).

Unmarked **shoals** make out to the northward and northwestward from Stover's Point; they can be avoided by keeping black buoy No. 5 bearing to the southward of **SE.**

A small detached spot with 13 feet over it lies about 350 yards from the eastern shore and ¼ mile to the northward of the steamboat wharf at Orr's Island.

1 A. ***Approaching and Entering.—From the Southward or Westward.***—When Half-way Rock light is made stand for it, being careful to avoid the dangers on East Cod and West Cod ledges; bring the light to bear **E.**, distant ¾ mile, and then steer **NE. ¾ N.** Leave Westernmost Drunkers Ledge spindle (iron, red and black horizontal stripes) and Mark Island Ledge buoy (spar, black, No. 1) ¼ mile on the starboard hand; when abreast of Little Mark Island monument, steer **NE. ¾ N.** and proceed as directed in Section 1, foregoing.

Remarks.—The dangers on East Cod Ledge are described under Section 1, "Sailing Directions, Portland Harbor," and those on West Cod Ledge under Section 1 A, same heading.

On the **NE. ¾ N.** course Webster Rock buoy (spar, black, No. 1) will be left about ½ mile on the starboard hand. Drunkers Ledge spindle will be made a little on the starboard bow, and Eastern Drunkers Ledge buoy (spar, red, No. 2) to the southward and eastward of the spindle. Mark Island Ledge black spar-buoy will be on the starboard bow and is left on the starboard hand, about ¾ mile beyond Drunkers Ledge spindle; Turnip Island Ledge red buoy will be on the starboad bow and about ¾ mile distant from Mark Island Ledge buoy. Little Mark Island Monument will be on the port bow and left about ½ mile on the port hand. The remarks and dangers, passing through Merriconeag Sound, are given under Section 1, foregoing.

Dangers.—An unmarked **ledge** with sunken rocks extends for ¼ mile in a **W SW.** direction from Halfway Rock light-house.

Webster Rock, with 11 feet of water on it, lies ¼ mile **N.** by **W.** from Halfway Rock light-house. It is marked by a buoy (spar, black, No. 1) placed on the northwestern side of the rock.

Drunkers Ledge consists of two distinct ledges lying in a **SE. ½ E.** and **NW. ½ W.** direction from each other and separated by a channel ¼ mile wide with good water. The eastern, with 4 feet of water on it, is marked by a buoy (spar, red, No, 2) placed on its southwestern side. The western, bare at half tide, is marked by a spindle (iron, red and black horizontal stripes) placed on its southwestern end and lying 1⅞ miles **N NE. ⅛ E.** from Halfway Rock light-house.

Mark Island Ledge, with 3 feet of water on it, lies nearly ¾ mile **S SE. ¾ E.** from Little Mark Island monument. It is marked on its western side by a buoy (spar, black, No. 1). See also page 144.

For description of remaining dangers see "Dangers" under Section 1, foregoing.

FREEPORT RIVER

is west of Maquoit Bay; the approach lies **N NE. ½ E.** from **Chebeag Point,** the northeastern point of Chebeag Island, between Bibber's Island on the east and Great Moshier's Island on the west. The entrance of the river is between Moore's Point on the east and Stockbridge's Point on the west, and is very narrow, with a least depth of 20 feet. From the entrance the channel leads between flats, mostly dry at low water, in a northerly direction a little over ¼ a mile to the town of **Freeport.** The principal dangers at the approach and entrance to the river are marked by buoys. Freeport has very little commerce; a small steamer daily from Portland and small coasting vessels are engaged in the carrying trade.

SAILING DIRECTIONS TO ENTRANCE OF FREEPORT RIVER.

Following the directions in Sections 1, 1 A, and 1 B, the least water will be 3¾ fathoms when to the eastward of Crab Island, near the entrance to the river.

1. ***Approaching and Entering.—From the Eastward.***—Proceed as directed in Section 1, "Sailing Directions, Crossing Casco Bay inside the islands," and when on the **NW.** course midway between Eagle Island and Upper Flag Island, and the northern end of the former bears **SW.**, steer **N.** by **W. ¾ W.** Leave the buoys at the entrance to Potts Harbor on the starboard hand; Whaleboat Ledge buoy (spar, red, No. 2) will be on the starboard bow, and when it bears **E.**, distant about 400 yards, steer **N.** by **E. ½ E.** for the western edge of French Island. When about ½ mile from French Island and when Upper Green Island bears **W.**, steer **N. ¾ W.** Pass about 200 yards to the eastward of Moshier's Ledge buoy (spar, red and black horizontal stripes) and when *Crab Island*—small, low, and bare islet—bears **W.**, distant about ¼ mile, steer **NW. ½ N.** for red spar-buoy No. 2, and anchor when nearly up to it in from 4 to 6 fathoms of water. Or, if wishing to go to Freeport, take a pilot.

Remarks.—The remarks and dangers until abreast Eagle Island are given under Section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 144.

On the **N.** by **E. ½ E.** course, after leaving Whaleboat Ledge buoy, **French Island,** small, bluff, covered with spruce and fir and about 40 feet high, will be ahead, and the **Upper Green Islands,** two small, bare, rocky islets, will be on the port bow.

On the **N. ¾ W.** course Moshier's Ledge buoy (spar, red and black horizontal stripes) will be a little on the port bow, and Crab Island Ledge buoy (spar, black, No. 1) beyond, and open a little to the westward of it.

On the **NW. ¼ N.** course Bowman's Island Ledge buoy (spar, red, No. 2) will be ahead, and beyond, and nearly in range with it. Freeport Upper Ledge buoy (spar, black, No. 3) will be seen. Strangers should be careful not to be set too much to the westward of the channel, as extensive flats rise very abruptly from deep water to the westward of a line joining Moshier's Ledge buoy and Bowman's Island Ledge buoy, and about 150 yards to the eastward of Crab Island. There is good anchorage in the channel anywhere to the northward of Moshier's Ledge buoy.

Dangers.—**Whaleboat Ledge,** a small detached rock with 9 feet of water on it, lies ¾ mile **N NW. ½ W.** from the southwestern end of Whaleboat Island. It is marked on its southwestern side by a buoy (spar, red, No. 2).

Little Whaleboat Ledge, with 2 feet on it, lying ⅝ mile **NE.** from Whaleboat Ledge, and the ledges making out for ¼ mile to the southward and westward from Little Whaleboat Island may be avoided by keeping Whaleboat Ledge buoy bearing to the southward of **S SW.**

Goose Nest Ledge lies nearly $\frac{5}{8}$ mile **NW. ½ N.** from the northeastern end of Stockman's Island; it is bare at half tide and extends for $\frac{3}{8}$ mile **N.** by **E.** from **Goose Nest**, a small bare island, surrounded by ledges, which is marked near its southern end by a buoy (spar, red, No. 8).

Upper Green Islands have a ledge making out 400 yards to the northward from them. To the southwestward of the islands is Green Island Ledge and buoy (spar, red, No. 4).

Moshier's Ledge, with 10 feet on it, is marked by a buoy (spar, red and black horizontal stripes) placed to the southward of it and lying a little over ¼ mile **NE. ¾ E.** from the northeastern end of Great Moshier's Island.

Busting's Island Ledge is a small unmarked 14-foot spot lying 400 yards **E.** from Moshier's Ledge buoy.

Crab Island Ledge, dry at half tide, makes out **NE.** nearly ⅜ mile from Great Moshier's Island. It is marked by a buoy (spar, black, No. 1) placed on its northeastern end.

A small unmarked 17-foot spot lies nearly ¼ mile **E.** from Crab Island.

1 A. ***Approaching and Entering.—From the Southward.***—When Halfway Rock light is made stand for it; pass about ½ mile to the westward, and when it bears **E.**, steer **N. ¼ E.** Pass about ½ mile to the eastward of W. Brown Cow and ¼ mile to the eastward of Broken Cave dry ledges, taking care to give the shore of Eagle Island a berth of at least ¼ mile. When the northern end of Eagle Island bears **E.**, distant ⅜ mile, steer **N. ¼ W.** until Whaleboat Ledge buoy (spar, red, No. 2) bears **E.**, distant about 400 yards, then steer **N.** by **E. ½ E.** and follow the directions in Section 1, foregoing.

Or, from a position ½ mile **E.** of Halfway Rock light-house, steer **N.** by **W. ⅛ W.**; give the shore of Eagle Island a berth of at least ¼ mile, and when the northern end of the Island bears **E.**, steer **N. ¼ W.** until Whaleboat Ledge buoy (spar, red, No. 2) bears **E.**, distant 400 yards; then steer **N.** by **E. ½ E.** and follow the directions in Section 1, foregoing.

Remarks.—Approaching Halfway Rock care should be taken to avoid the dangers on East Cod and West Cod ledges, which are described under Sections 1 and 1 A, "Sailing Directions, Portland Harbor."

On the **N. ¼ E.** course Eagle Island, densely wooded, will show on the starboard bow, and **W. Brown Cow**, bare rocky islet, on the port bow. The remarks and dangers beyond Eagle Island are given under Section 1, foregoing.

Dangers.—A **dangerous ledge** makes off nearly ¼ mile in a **W SW.** direction and about 200 yards to the eastward from Halfway Rock light.

Webster Rock is described on page 150.

Eagle Island Ledge, dry at low water, lies 200 yards **SE. ½ S.** from the southern end of Eagle Island; the shoal ground, with 8 to 10 feet of water on it, extends 300 yards **SE.** and 500 yards **E.** from the dry rock.

Broken Cave is a group of bare rocks and small islets connected by ledges extending for ⅝ mile in a general **NE.** direction from W. Brown Cow. They lie from ⅝ mile to 1 mile **SW.** by **W.** from Eagle Island, and can be avoided by not passing more than ¼ mile to the westward of the island.

Eagle Island has ledges extending 400 yards from its western shore.

1 B. ***Approaching and Entering.—From the Westward.***—Follow the directions in Section 1 B, "Sailing Directions, Portland Harbor," and when Cape Elizabeth West light bears **NW.**, distant 1⅛ miles, and Taylor's Rock buoy (can, black, "T. R." in white letters) is distant about ¼ mile on the port hand, steer **N NE.** Broad Cove Rock buoy (can, black, "B. C. R." in white letters) will be left about ½ mile on the port hand and Witch Rock buoy (nun, red, "W. R." in white letters) will be left about ⅜ mile on the port hand. The red and black horizontal striped can-buoy marking The Hussey will be on the starboard bow, and when it bears **E.**, distant ½ mile, steer **NE. ½ E.** through Luckse's Sound, heading for about the middle of Whaleboat Island. When the northern end of Stockman's Island bears **NW.** by **W.**, distant about ¼ mile steer **N. ¼ W.** so as to pass about 400 yards to the westward of Whaleboat Ledge buoy, and proceed as directed in Section 1, foregoing.

Remarks.—The remarks and dangers approaching Cape Elizabeth are given under Section 1 B, "Sailing Directions, Portland Harbor." On the **N NE.** course Broad Cove Rock buoy (can, black, "B. C. R." in white letters), Trundy's Reef buoy (nun, black, "T. R." in white letters), Jordan's Reef buoy (nun, red and black horizontal stripes), Witch Rock buoy (nun, red, "W. R." in white letters), and Ram Island Ledge tripod (red, wooden, 50 feet high, upper part boarded) will all be made on the port bow and left on the port hand.

Luckse's Sound is comparatively free from dangers, and the western shores of Crotch and Stave islands, and the eastern shores of Marsh, Hope, Rogue's, Little Bangs, and Stockman's islands are bold-to and may be approached to 150 yards. Sand Island is surrounded by ledges and has an unmarked 16-foot spot lying 300 yards to the eastward from it. The remarks and dangers above Stockman's Island are given under Section 1, foregoing.

Dangers.—**Taylor's Reef, Broad Cove Rock,** and **Trundy's Reef** are described under Section 1 B, "Sailing Directions, Portland Harbor." **Mitchell's Rock** and **Pine Tree Ledge,** under Section 1 A, same heading, and **Jordan's Reef** and **Witch Rock,** under Section 1, same heading.

The Hussey, a small rock with 12½ feet of water on it, lies about the middle of the entrance to Luckse's Sound, and is surrounded by deep water; it is marked by a buoy (can, red and black horizontal stripes) placed on its southwestern side. To avoid the rock give this buoy a berth of 300 yards.

Crotch Island Ledge, with 3 feet of water on it in places, makes out nearly ½ mile in a **SW. ¼ W.** direction from the southern end of Crotch Island. It is marked on its outer end by a buoy (spar, red, No. 4). There is no safe passage between the buoy and the island.

An unmarked 16-foot spot lies 300 yards east of Sand Island.

Stave Island Ledge, bare at low water, extends ¼ mile **NE.** from the long, rocky point on the northeastern end of Stave Island. It is marked on its end by a buoy (spar, black, No. 5).

1 C. ***Approaching and Entering.—From Portland Harbor.***—*Note.*—These directions are good for a draught of 12 feet. Strangers drawing more water should take a pilot.

Bring the Breakwater light to bear **SW.** and steer **NE.**, passing close to the westward of red spar-buoy No. 2, about 300 yards to the westward of buoy No. 4, and 400 yards to the westward of Cow Island Ledge black spindle. When the spindle bears abeam, steer **NE.** by **E.** ½ **E.** and pass about 300 yards to the southeast of Lower Basket Ledge black spindle, and when it bears abeam steer **NE.** ½ **E.** Pass about 100 yards to the northward of Chebeag Bar buoy (spar, red, No. 4), and when it bears **S.** steer **E.** by **N.** for about ¾ mile until the eastern end of Littlejohn's Island comes in range with Cornfield Point, bearing about **N.** by **W.** ½ **W.**; then steer **NE.** ½ **E.** Pass about 300 yards to the southeastward of the eastern end of Great Moshier's Island and 200 yards to the southeastward of Moshier's Ledge buoy (spar, red and black horizontal stripes), and when it bears **NW.** steer **N.** ¾ **W.**; give it a berth of about 200 yards on the port hand. When *Crab Island*, small, low, and bare islet, bears **W.**, distant about ¼ mile, steer **NW.** ½ **N.** and anchor to the southeastward of the red spar-buoy, which will be seen ahead, in 4 to 6 fathoms water. If bound into the river take a pilot.

Remarks.—On the **NE.** course Fort Gorges will be left nearly ¼ mile on the starboard hand. **Basket Island**, small, low, with a few trees near its southern end, will be ahead.

On the **NE.** by **E.** ½ **E.** course Lower Basket Ledge spindle should be on the port bow and Seal Ledge buoy (spar, red, No. 2) will be on the starboard bow, and should be left a little over ¼ mile on the starboard hand on the **NE.** ½ **E.** course. On the latter course red spar-buoy No. 4 will show a little on the starboard bow and just open to the eastward of Littlejohn's Island. The course leads about midway between the red buoy on Chebeag Bar and Littlejohn's Island. The channel here is about 200 yards wide. After leaving red buoy No. 4 the **E.** by **N.** course leads for the red spar-buoy on Green Island Ledge; the black spar-buoy marking Chebeag Point Ledge will be on the starboard bow; the southeastern end of Littlejohn's Island should not be approached closer than ¼ mile on this course.

The **NE.** ¼ **E.** course leads for the southwestern end of **Bibber's Island**, about 40 feet high, with a few scattered trees. Great Moshier's Island will be on the port bow, and a little open to the eastward of it will be seen Moshier's Ledge buoy (spar, red and black horizonial stripes). The remarks and dangers beyond Moshier's Ledge buoy are given under Section 1, foregoing.

Dangers.—**Hog Island Ledge** is the shoal ground extending from the western shore of Diamond Island. Its extreme western end, which extends about 700 yards to the westward from the middle of the island, is marked by a buoy (spar, red, No. 2). The ledge on which Fort Gorges is built is also called **Hog Island Ledge**. It is partly bare at low water and extends 400 yards in a westerly direction and 600 yards in a northerly direction from the fort; this, together with the extensive shoal grounds extending 1⅛ miles **S.** from Mackey's Island, contracts the channel between the 12-foot curves ¼ mile **N.** of Fort Gorges to 200 yards.

Brimstone Point Ledge makes out nearly ¼ mile in a **NNW.** direction from the northern end of Great Diamond Island. It is marked on its end by a buoy (spar, red, No. 4).

Cow Island Ledge, partly bare at low water, is marked by a spindle (iron, black, cage on top), lying ⅝ mile **N.** by **W.** from the northeastern end of Cow Island. The ledge is about 250 yards long, **NNE.** and **SSW.**, and the spindle is near its southern end.

Lower Basket Ledge, bare at half tide, lies ½ mile **SE.** by **E.** from the southern end of Basket Island. It is marked on its southeastern end by a spindle (iron, black, cage on top). The ledge extends 275 yards to the westward and northwestward of the spindle, and about 150 yards to the eastward of it.

Seal Ledge, bare at low water, makes out for ⅜ mile in a **NW.** direction from the western shore of Great Chebeag Island to the eastward of Lower Basket Ledge spindle. It is marked on its end by a buoy (spar, red, No. 2).

Chebeag Bar is a long, sandy bar, bare at low water, making out from the middle of the northern shore of Great Chebeag Island and extending to within ⅛ mile of Littlejohn's Island. It is marked on its northern end by a buoy (spar, red, No. 4).

An extensive **shoal** extends from the shore of Great Chebeag Island between Chebeag Bar and **Chebeag Point**, the northeastern point of the island. The sailing line leads well to the northward of this shoal.

An unmarked **shoal** makes out to the southward about 400 yards from the southeastern side of Littlejohn's Island, nearly ½ mile to the eastward of Chebeag Bar.

Chebeag Point Ledge, with 3 feet of water on it, makes out in a **NNE.** direction for 400 yards from the northeastern point of Great Chebeag Island. It is marked on its end by a buoy (spar, black, No. 3).

Green Island Ledge, a small detached ledge with 6 feet of water on it, lies ¼ mile **SW.** by **W.** from the southernmost of the Green Islands. It is marked on its western side by a buoy (spar, red, No. 4).

Moshier's Ledge and the remaining dangers are described under Section 1, foregoing.

YARMOUTH RIVER

is a narrow, crooked, shallow stream to the westward of Freeport River; its approach is to the westward of **Cousin's Island**, in the northwestern part of Casco Bay; the entrance is between Fogg's Point on the east and Parker's Point on the west, and lies **NNE.** ½ **E.** from the northwestern point of Cousin's Island. The river makes in a northwesterly direction about 1¾ miles to the town of Yarmouth. Strangers cannot enter without a pilot. **Cousin's River**, a narrow, shallow stream, empties into the mouth of Yarmouth River from the northward. The channels in the approach and up these rivers lead through extensive flats that are dry at low water.

SAILING DIRECTIONS TO ENTRANCE OF YARMOUTH RIVER.

Strangers should not attempt these directions except in the daytime with clear weather. The least depth on the sailing lines is 19 feet in Section 1, 22 feet in Section 1 A, and about 12 feet in Section 1 B.

1. ***Approaching from the Eastward.***—Proceed as directed in Section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 144. When on the **NW.** course, and the northern end of Eagle Island bears **SW.**, steer **N.** by **W.** ¾ **W.** Leave the buoys at the entrance to Potts Harbor on the starboard hand, and pass about 400 yards to the westward of Whaleboat Ledge buoy (spar, red, No. 2). The course leads ⅜ mile **E.** of the northern point of Great Chebeag Island, and midway between Chebeag Point Ledge buoy (spar, black, No. 3) and Green Island Ledge buoy (spar, red, No. 4). When the latter buoy is abeam, steer **W.** ¾ **S.**, passing to the northward of black buoy No. 3, and to the northward of Chebeag Bar buoy (spar, red, No. 4), about midway between it and Littlejohn's Island, When this buoy bears **S.**, steer **SW.** by **W.** ½ **W.** until the southern and southwestern points of Cousin's Island are in range bearing **NW.** by **N.**, then steer about **NW.** by **W.** Leave the points of Cousin's Island at least 350 yards on the starboard hand, and when *Birch Point*, the westernmost point of Cousin's Island, bears **E.**, distant about 500 yards, steer **NE.** ¾ **N.**, and anchor in 3½ to 4 fathoms, with Birch Point bearing about **S SW.** If bound into Yarmouth River take a pilot.

Remarks.—The remarks and dangers until up to Eagle Island are given under Section 1, "Sailing Directions, Crossing Casco Bay inside the islands," page 144. The red and black horizontal striped spar-buoy, and red spar-buoy No. 6, marking the western side of the entrance to Potts Harbor, will be left from 200 to 500 yards on the starboard hand. Whaleboat Ledge buoy (spar, red, No. 2) will be on the starboard bow, and left about 500 yards on the starboard hand. Green Island Ledge buoy (spar, red, No. 4) should be on the starboard bow; the Upper Green Islands will show on the starboard bow, and black spar-buoy No. 3, off Chebeag Point, will show on the port bow.

Standing for Chebeag Bar care must be exercised not to be set to the southward on to the shoals making out from the northern side of Great Chebeag Island. Shoals also make out for 400 yards to the southeastward from the southeastern side of Littlejohn's Island.

On the **SW.** by **W.** ½ **W.** course Basket Island and Upper Basket Ledge spindle will be on the starboard bow, and Lower Basket Ledge spindle on the port bow.

The **NW.** by **W.** course leads about 400 yards to the southward of Spruce Point. The approach to Yarmouth River, between Cousin's Island and the mainland, is much obstructed by shoals about ¾ mile above Birch Point. Strangers should not stand on over ½ mile beyond the point.

Dangers.—**Goose Nest Ledge, Whaleboat Ledge,** and **Little Whaleboat Ledge** are described under Section 1, "Sailing Directions to Entrance of Freeport River," pages 150, 151, and Green Island Ledge, Chebeag Point Ledge, and **Chebeag Bar** are described under Section 1 C, same heading.

An unmarked 14-foot spot lies ⅝ mile **SW.** ¾ **W.** from Chebeag Bar buoy; it can be avoided by keeping the buoy bearing to the eastward of **NE.** ¾ **E.**

Upper Basket Ledge, bare at low water, is marked on its northern side by a spindle (iron, black, cage on top) lying ⅝ mile **NE.** by **E.** from the northeastern end of Basket Island. The ledge is about 300 yards in diameter and surrounded by deep water.

Unmarked **shoals** fill the bight between Spruce and Birch points, and extend 200 yards to the southward from the latter point.

1 A. ***Approaching from the Westward.***—Proceed as directed in Section 1 B, "Sailing Directions, Portland Harbor," until Cape Elizabeth west light bears **NW.**, distant 1⅛ miles; then follow the directions in Section 1 B, "Sailing Directions to Entrance of Freeport River," page 151, and when the red and black horizontal striped can-buoy, marking The Hussey, bears **E.**, distant ½ mile, steer about **N NW.** ¼ **W.** through Hussey's Sound. Give the southwestern end of Overset Island a berth of about 400 yards, and when *Pumpkin Nob*—a round islet with a few trees on it, off the northern end of Peak's Island—bears **W.**, distant about 300 yards, steer **N.** by **E.** ½ **E.** Having stood on this course about 3¼ miles, pass about midway between Basket Island and Upper Clapboard

Island Ledge buoy (spar, red, No. 8), and steer **NE.** by **N.**; give Basket Island a berth of at least 250 yards, and Birch Point a berth of about 300 yards; anchor when about ½ mile beyond the latter in 3½ to 4 fathoms, soft bottom.

Remarks.—The remarks and dangers until up to The Hussey, are given under Section 1 B, "Sailing Directions to Entrance of Freeport Harbor," page 151. The shores of Hussey's Sound are comparatively bold-to, and can be approached as close as 300 yards except off the southern side of the entrance, where an unmarked ledge makes out ¼ mile from the eastern shore of Peak's Island.

On the **N.** by **E.** ½ **E.** course the southwestern shore of Long Island will be left about ¼ mile on the starboard hand, and the eastern shore of Cow Island ¼ mile on the port hand. The black iron spindle marking Cow Island Ledge will be left about ½ mile on the port hand. **Basket Island**, low and sparsely wooded, will show a little on the starboard bow, and to the eastward of it the black iron spindles on Lower Basket and Upper Basket ledges. Red spar-buoy No. 8 will show a little on the port bow. After changing course to **NE.** by **N.**, care should be exercised to keep at least 225 yards from Basket Island, to avoid the ledges making out to the westward from it.

Dangers.—An unmarked **ledge**, with 11 feet on it, makes out ¼ mile from the eastern shore of Peak's Island. It can be avoided by keeping the eastern side of Pumpkin Nob bearing to the westward of **N NW.**

Upper Clapboard Island Ledge, a detached ledge with 7 feet on it, lies ⅜ mile **W.** from the southern end of Basket Island. It is about 150 yards long in an **E.** and **W.** direction, and is marked on its southern side by a buoy (spar, red, No. 8).

Unmarked **ledges** surround Basket Island, and extend 200 yards from its western and northwestern shores.

1 B. ***Approaching from Portland Harbor.***—Bring the Breakwater light to bear **SW.** and steer **NE.** for Basket Island. Pass close to the westward of red spar-buoy No. 2, about 300 yards to the westward of red spar-buoy No. 4, and 400 yards to the westward of the black iron spindle on Cow Island Ledge. Pass about ⅜ mile to the eastward of Clapboard Island, and when its northern end bears **NW.**, steer **NE.** by **N.**, pass midway between Basket Island and red buoy No. 8, and proceed as directed in Section 1 A, foregoing.

Remarks.—The dangers on the **NE.** course, until past Cow Island Ledge, are given under Section 1 C, "Sailing Directions to Entrance of Freeport River," page 152. **Clapboard Island**, about 40 feet high, with a stunted growth of trees on it, and small, rocky islets off its southern end, will be on the port bow, and should be given a berth of a little over ¼ mile at its southern and southeastern ends, to avoid the sunken ledges making out from them. Beyond Basket Island, the remarks and dangers are given under Section 1 A, foregoing.

PORTLAND HARBOR. †

This harbor, in the western side of Casco Bay, is the approach to the city of Portland, the principal maritime port on the coast of Maine. The entrance from seaward is about 38 miles **W.** from Monhegan and 60 miles **N NE.** ⅞ **E.** from Cape Ann; Portland Head light-house, on the western point, at the entrance, is 3½ miles **N.** ⅝ **E** from Cape Elizabeth east light-house, an off-shore guide to the entrance. There are several entrances to the harbor between the islands to the eastward; some of these are marked by aids to navigation, but they are principally used by local vessels or those towing from Portland to different points in Casco Bay and its estuaries. Off Cape Elizabeth and the entrance are numerous ledges and sunken rocks which make the approach dangerous in thick weather, especially for deep-draught vessels, but in clear weather, entrance for the largest vessels is comparatively easy as the principal dangers to be avoided are marked by buoys.

Portland has a large foreign and coastwise trade, and is entered by vessels of the largest class; steamers leave the port loaded to 27 feet draught. Inside its entrance the port is known as the Lower and Upper harbors. Two villages, **Ferry Village** and **Knightville**, are on the Cape Elizabeth side of the Upper Harbor; the former has communication with Portland by ferry, and the latter by a draw-bridge.

The Lower Harbor is to the southward and eastward of a line from Fort Gorges to Fort Preble, including Hog Island Roads, the latter being an excellent anchorage between the islands east of Portland Breakwater, with depths ranging from 3½ to 7 fathoms.

The Upper Harbor is to the westward of a line from Fort Gorges to Fort Preble, and is formed by the **Fore River**, which makes in to the southwestward between Cape Elizabeth on the south and the city of Portland on the north. **A breakwater**, with a light-house at its end (see table of lights, page 112), extends out in a northeasterly direction from the northern part of Cape Elizabeth. Portland bridge crosses the upper harbor about 1½ miles above the end of the breakwater, and above this bridge are three others; the width of the draws is about 40 feet.

Back Cove is on the north side of the city of Portland. It is nearly all bare at low water, and has a narrow, crooked channel along the northern water front of the city, which it is proposed to dredge to a width of 300 feet and depth of 12 feet. Near its entrance the cove is crossed by two draw-bridges; width of draws about 40 feet.

The depth of water in the channel to the Upper Harbor and Quarantine anchorage is 6 fathoms, and in the Upper

† Shown on Coast and Geodetic Survey charts: 395, scale $\frac{1}{20,000}$, price $0.40; and 315, scale $\frac{1}{40,000}$, price $0.25; and 108, 107, scale of each $\frac{1}{80,000}$, price of each $0.50.

Harbor it is 21 feet. Under the supervision of the U. S. Engineers improvements are in progress and a channel 2,800 feet long, 227 feet wide, and 29 feet deep has been dredged (in 1890) from the deep water of the harbor to the wharves at which the heaviest draught steamships load; it is proposed to widen this channel to 500 feet. Alongside the wharves the depth ranges from 12 to 29 feet, according to locality. The channel is easily followed in clear weather when the buoys marking the principal dangers can be seen. It leads in a general **N** by **W**. direction past Portland Head and to the westward of Cushing and House islands; when past the latter it leads about **NW**. for the eastern end of the peninsula on which the city is built; it then bends to the southwestward along the city front.

Prominent objects.—High Head, and Cape Elizabeth lights and life-saving station will be readily distinguished. The eastern shore of Cape Elizabeth, to the northward of the lights, is moderately high and rocky with ledges, which show bare at low water, making out in many places. **Portland Head light** is about 3½ miles **N. ¾ E.** from Cape Elizabeth East light-house. **Cushing Island**, high, with few trees and rocky water line, lies **N NE.** from Portland Head, on the eastern side of the entrance to the harbor; the large hotel near the western end of the island is a prominent mark. **Ram Island**, a bare, rocky islet, surrounded by ledges, on the southernmost of which is a beacon, is about ⅜ mile **S.** from **White Head**, the high eastern end of Cushing Island. To the northward and northeastward of Cushing Island are numerous islands which lie in the western part of Casco Bay. When standing into the entrance the observatory on **Munjoy's Hill**, the northeastern end of Portland, will show prominently.

Pilots.—Between November 1 and May 1 a pilot boat will usually be found cruising off Portland Head, and vessels desiring a pilot will be boarded when making signal. In the summer pilots are on the lookout for vessels requiring their services, and vessels making signal for a pilot should stand off and on outside of Portland Head until boarded. There are licensed pilots for this port, but pilotage is not compulsory. Strangers entering the port generally take a pilot. The rates are $3 per foot draught entering, and $1.25 per foot draught leaving the port.

Tow-boats will usually be found cruising off the entrance and in the harbor. They are used by vessels going alongside the wharves or through the bridges. Under an agreement among the tow-boat owners regular rates have been adopted for towing vessels within the harbor, but for towing in from sea an agreement is made between the vessel and tow-boat.

Anchorages.—The best anchorage in the Lower Harbor is in Hog Island Roads. Vessels sometimes anchor, for a limited period, in the channel below Fort Preble, but the holding ground is not good. The anchorage in the Upper Harbor is on the Cape Elizabeth side of the channel, and is marked by buoys (see Harbor Regulations, Appendix II). The **Quarantine anchorage** is northeast of a line from the marine hospital to Fort Gorges, and has a depth ranging from 3½ to 4½ fathoms. Vessels subject to visitation by the health office anchor within these limits.

Harbor Regulations.—The harbor master has charge of the anchorages and sees that vessels do not anchor outside the authorized limits (see Harbor Regulations, Appendix II).

Quarantine Regulations.—The harbor master and city physician shall perform the duties relative to quarantining vessels as may be required by the local board of health (see also Appendix II).

Marine Hospital.—The Marine Hospital is situated a short distance from the city; the surgeon in command has an office at the Custom House (see Appendix IV).

Supplies.—Anthracite and bituminous coal in large quantities can be had alongside the wharves or from lighters. Water can be obtained alongside the wharves or from water boats. Provisions and ship chandler's stores are to be had in the city.

Repairs.—The facilities for repairing vessels are of the best. There are two Simpson dry docks and one marine railway on the Cape Elizabeth side of the harbor. The largest dry dock is 400 feet long over all, 385 feet long on keel blocks, 100 feet wide on top, 45 feet wide on bottom over sills, and 78 feet wide at the gate; the greatest draught taken in is 22 feet, the ordinary draught 18 feet, and its capacity, vessels of 4,000 registered tons. The small dry dock is 160 feet long over all, and 152 feet long on keel blocks, 58 feet wide on top, 33 feet wide on bottom over sills, and 38 feet wide at the gate; the greatest draught taken over sills is 12 feet, and its capacity is vessels up to 800 registered tons. The marine railway has two cradles which can be worked separately or together; their combined length is 232 feet and width 37 feet; the upper cradle is 130 feet long, the lower 102 feet long, and the incline is ⅞ inch to 1 foot. The greatest draught taken out is 10 feet forward and 16 feet aft, and the capacity is vessels up to 800 registered tons.

The facilities for repairs to machinery of steamers are good; there are several machine shops where building and repairing can be done.

Wind Signals of the U. S. Signal Service are shown from a building opposite the post office, and can be readily seen by the shipping in the harbor. For explanation of signals see Appendix III.

Railroad and steamboat communication.—The railroads entering Portland are the Boston & Maine, Maine Central, Grand Trunk, Portland & Ogdensburg, and Portland & Rochester. There are lines of steamers to New York, Boston, the British Provinces and intermediate ports on the coast of Maine. In the winter two English lines of steamers, from Glasgow and Greenock, call at Portland.

Ice seldom obstructs navigation; when it does it is only for a limited time; the tow-boats generally keep a clear channel to the wharves.

Tides.—The mean rise and fall of tides is 9.1 feet. See also the table on page 116.

SAILING DIRECTIONS, PORTLAND HARBOR.

These directions are good for vessels of the heaviest draught, and lead to the anchorage in Hog Island Roads or to the Quarantine anchorage. Directions for entering Portland Harbor from the northward, for vessels of 12 feet or less draught that have crossed Casco Bay inside the islands, are given in Section 2, page 145. Vessels of over 17 feet draught do not usually anchor in the Upper Harbor, but go alongside the wharves.

1. *Approaching.—From the Eastward, passing south of Halfway Rock.*—Follow the directions for crossing Casco Bay outside the islands, page 143. I. Or, when Halfway Rock light is made, steer so as to pass about ¾ mile south of it and pass about midway between the light and whistling buoy to the southward. Then steer **W. ⅜ N.**, heading for Portland Head light; leave Witch Rock buoy 400 yards on the port hand and the tripod beacon on Ram Island ledge about 500 yards on the starboard hand. When the beacon bears **NE.**, distant about 750 yards, steer **NW.** by **W.**, leaving the red bell-buoy off southwestern point of Cushing Island about 300 yards on the starboard hand, and when the bell-buoy bears **E.**, distant about 400 yards, steer **N.** and follow the directions in Section 2.

At night proceed as directed above until about ¾ mile from Portland Head light and Cape Elizabeth east light bears **S SW.**; then steer **NW.** by **W.**, passing to the southward of the red bell-buoy. When Portland Head light bears **S. ¼ E.**, steer **N. ¼ W.**, keeping the light astern. When Portland Breakwater light bears **W.** haul to the eastward and anchor in Hog Island Roads in 6 fathoms of water, soft bottom.

II. Or, bring Portland Head light to bear **W NW. ¼ W.** and steer for it on the bearing. Pass about 400 yards south of Witch Rock buoy, and when the buoy bears abeam steer **NW. ¾ W.** and pass about 200 yards south of the bell-buoy off the southwestern point of Cushing Island. Bring the bell-buoy to bear **E.**, distant about 400 yards, and steer **N.**; then follow the directions in Section 2.

At night proceed as directed above until Cape Elizabeth east light bears **S SW.**, then steer **NW.**, passing to the southward of the bell-buoy. Bring Portland Head light to bear **S. ¼ E.** and steer **N. ¼ W.**; then follow the directions given above for entering at night.

Remarks.—On the **W. ⅜ N.** course from Halfway Rock, **Junk of Pork**, bare and nearly flat rock, with grass on its highest part, will be left about ¾ mile on the starboard hand. **Outer Green Island** is just to the northward of Junk of Pork. **White Head**, the eastern point of Cushing Island, shows as a high, abrupt, rocky bluff, with a round summer-house on its highest part; the large hotel near the western end of the island shows conspicuously.

To the southward of White Head is **Ram Island**, and farther south is the tripod beacon on Ram Island Ledge. **Peak's Island** is the large island north of White Head, and Hussey's Sound leads into Casco Bay to the eastward of it. There are channels leading into Portland Harbor between Cushing and Peak's islands and between Peak's and Great Diamond islands, but they should not be attempted by a stranger without the chart. The buoy which will be seen to the southward of the sailing line should be given a berth of 400 yards by heavy draught vessels.

The **NW.** by **W.** course leads about 400 yards south of the southwestern point of Cushing Island, and fair into the middle of the entrance to the harbor.

Dangers.—**East Cod Ledge** has depths ranging from 4¾ to 9½ fathoms over it, and lies 3¼ miles **S.** by **W. ½ W.** from Halfway Rock light-house; the sea breaks over it in heavy weather. To avoid this ledge and West Cod Ledge keep Portland Head light bearing to the westward of **W NW. ¼ W.** until Halfway Rock light bears to the eastward of **NE.**

Bulwark Shoal, a dangerous ledge with 14 feet over it, is the easternmost of the line of rocks forming West Cod Ledge; it lies about 3½ miles **SW. ¾ S.** from Halfway Rock light-house, and is marked by a buoy (nun, red and black horizontal stripes) placed about ⅛ mile **SE.** from the shoalest part of the ledge. West Cod Ledge is described under Section 1 A.

Witch Rock is a small rock with 4 fathoms of water over it, and lies nearly ¾ mile **SE. ¼ S.** from the beacon on Ram Island ledge and 1⅝ miles **E.** by **S.** from Portland Head light-house. A buoy (nun, red, with "W. R." in white letters) is placed about 100 yards **SE.** from the shoalest part of the rock.

Ram Island Ledge is an extensive ledge showing partly bare, and lying just to the southward of Ram Island. The southern end of the ledge is marked by a red tripod beacon about 50 feet high, which bears **E NE.** by **E.**, distant 1 mile from Portland Head light-house.

Jordan's Reef (Bell Rock) is about 200 yards long **NE.** and **SW.**, and has a least depth of 22 feet over it. A buoy (nun, red and black horizontal stripes) is placed 50 yards southeast from the reef and bears **SE.** by **E.**, distant 1 mile from Portland Head light-house.

Catfish Rock has 16 feet of water over it and lies about 150 yards to the westward of the southwestern point of Cushing Island; it is marked by a buoy (spar, red, No. 2), which is left on the starboard hand when entering. About 250 yards south of the SW. point of Cushing Island is a red bell-buoy.

1 A. *Approaching.—From the Southward, passing through West Cod Ledge.*—Keep about 5 miles to the southward of Cape Elizabeth lights and bring Portland Head light to bear **N NW. ½ W.**; steer for the light on this bearing, and when the two Cape Elizabeth lights are in range steer **N.** until Portland Head light bears **NW. by N.** Steer for Portland Head light on the **NW. by N.** bearing, and when it is about 1 mile distant ahead and Cape Elizabeth east light bears **S SW.**, steer **N NW.**, passing about ¼ mile to the eastward of the light-house and about 500 yards to the westward of the southwestern point of Cushing Island. When Portland Head light bears **S. ¼ E.**, steer **N. ¼ W.**, keeping the light astern. When Portland breakwater light bears **W.**, haul to the eastward and anchor in Hog Island Roads in 6 fathoms, soft bottom.

Or, being outside of West Cod Ledge, bring Portland Head light to bear **NW.** and steer for it on this bearing until the two Cape Elizabeth lights are in range; then steer **NW. by W. ½ W.** until Portland Head light bears **NW. by N.** Steer for the light on this bearing; then follow the directions in the preceding paragraph.

Remarks.—Approaching from the southward at night to pass between West Cod Ledge Rock and Corwin Rock, Wood Island light should be kept bearing to the westward of **W. ⅝ S.** until Portland Head light bears **N NW. ½ W.**; this will clear the Hue and Cry Rocks. The **N NW. ½ W.** course for Portland Head light leads midway between West Cod Ledge Rock and Corwin Rock. When the course is changed to **N.** it is to avoid Willard Rock. The **NW. by N.** course for Portland Head light leads midway between Pine Tree Ledge and Willard Rock; the light should be given a berth of about ¼ mile while passing it. See also the remarks under Section 2.

Dangers.—**West Cod Ledge** is a broken line of rocks with deep water between them, extending 5 miles in an **E-NE.** and **W SW.** direction, to the eastward of Cape Elizabeth; **Bulwark Shoal**, the easternmost of these rocks, is described under section 1, page 156. **Bache Rock** has 4¼ fathoms of water over it, and lies 5 miles **E. ⅝ N.** from Cape Elizabeth east light-house; the sea breaks over it in heavy gales. **West Cod Ledge Rock** has a depth of 4½ fathoms over it and lies 3¼ miles **E. ⅝ S.** from Cape Elizabeth east light-house; it is not marked, but the sea breaks over it in heavy gales. **Corwin Rock**, with 3½ fathoms over it, lies 2⅝ miles **SE. by E. ½ E.** from Cape Elizabeth east light-house; it is marked by a buoy (nun, red and black horizontal stripes and "C. R." in white letters) placed about 30 yards **SE.** from the rock. Heavy draught vessels should leave this buoy on the port hand when standing for Portland Head light. **Alden's Rock** is the westernmost rock of West Cod Ledge; it has 6 feet of water over it and lies 2 miles **SE. by E.** from Cape Elizabeth east light-house. A buoy (nun, black, with "A. R." in white letters) is placed 350 yards **S.** of the rock. Vessels of heavy draught should not pass between this buoy and Corwin Rock, which is about ½ mile **NE. by E. ½ E.** from Alden's Rock, as the depth is 4½ to 5½ fathoms, and the sea breaks in heavy gales.

East Hue and Cry Rocks is a cluster of rocks, with depths of 3¼ to 6½ fathoms over them, lying 3 miles **SE. by S.** from Cape Elizabeth east light-house; the shoalest part of this ledge is about ¼ mile long in a **N NNW.** and **S SE.** direction, and is marked off its eastern side by a buoy (can, black, No. 1). About ½ mile south of this buoy is a spot with 4½ to 6¼ fathoms of water over it.

West Hue and Cry is a rock with 4½ fathoms over it, lying ⅝ mile **W.** from East Hue and Cry Rocks buoy.

Old Anthony, or Vapor Rock, is described under Section 1 B, following.

Mitchell Rock has 5¼ fathoms of water over it, and is dangerous only in heavy weather; it lies 1⅝ miles **E.** from Cape Elizabeth east light-house.

Broad Cove Rock and **Trundy's Reef** are described under Section 1 B, following.

Willard Rock has 5¼ fathoms over it and lies nearly 1⅝ miles **S SE. ⅛ E.** from Portland Head light-house.

Pine Tree Ledge has 18 feet of water over it at low water of spring tides; it is a small unmarked ledge and lies 1⅝ miles **SE. ⅛ E.** from Portland Head light-house.

Jordan's Reef and **Witch Rock** are described under Section 1, preceding.

1 B. *Approaching.—From the Southwestward.*—When Cape Elizabeth lights are made, bring the east light to bear between **N. ½ W.** and **N NE.** and steer for it between these bearings; pass from ¼ mile to 1¼ miles to the westward of the whistling buoy. Then bring the east light to bear **N.**, and when the southern end of Richmond's Island bears about **W.**, or Wood Island light bears **SW. by W. ½ W.**, steer **NE. by E. ½ E.** until Cape Elizabeth east light bears **NW.** Then steer **N. by E. ¼ E.**, heading for the eastern end of Peak's Island, and when Portland Head light bears **NW. by N.**, steer for it on this bearing until it is about 1 mile distant and Cape Elizabeth east light bears **S SW.**; then steer **N NW.** and pass about ¼ mile to the eastward of Portland Head light. When the southwestern point of Cushing Island bears **E.**, steer **N.**, heading for the western angle of Fort Gorges, and follow the directions in Section 2.

Note.—It is advisable for strangers entering at night to follow the directions in Section 1 A, foregoing.

Remarks.—Approaching Cape Elizabeth lights from the southwestward, Saco Bay and Wood Island light will be left on the port hand. If well to the westward, the hotels and summer-houses on Old Orchard Beach will be seen about 7½ miles to the westward of Cape Elizabeth lights. **Prout's Neck**, the northern point of Saco Bay, is about 5 miles **W.** from Cape Elizabeth, and Richmond's Island is about 2 miles to the southwestward of the lights. Following the directions, when about 3 miles distant from Cape Elizabeth lights a sharp lookout should be kept for the buoys marking the principal dangers. When standing on the **NE.** by **E.** ½ **E.** course Cape Elizabeth should be left about 1 to 1¼ miles on the port hand. When the course is changed to **N.** by **E.** ¼ **E.** Taylor's Reef buoy should be distant about ⅜ mile on the port quarter; the eastern edge of Peak's Island will be ahead, with Hussey's Sound showing as a small opening just to the eastward of it. As Portland Head light is approached on the **NW.** by **N.** course, Jordan's Reef (Bell Rock) buoy will be left on the starboard hand. On the **NNW.** course the entrance of the harbor will be ahead.

Dangers.—**Old Anthony**, or **Vapor Rock**, has 18 feet over it at low water and lies 1¾ miles **S.** by **E.** ½ **E.** from Cape Elizabeth east light-house; it is marked off its southern side by a buoy (can, red and black horizontal stripes) with "O. A." in white letters). About ½ mile **SW.** by **W.** from this buoy is a red whistling buoy which bears **S.** ½ **E.**, distant 1⅞ miles from Cape Elizabeth east light-house.

Watts' Ledge makes off about ⅜ mile to the eastward from the southeastern point of Richmond's Island; it is partly bare, and is avoided by keeping Cape Elizabeth east light bearing to the northward of **NE.** ½ **N.**

Lying 1½ miles **SW.** by **S.** from Cape Elizabeth east light-house is a spot with 4½ fathoms over it, on which the sea breaks in heavy gales.

Taylor's Reef is a group of rocks with 15 to 18 feet of water over them, which extends about ½ mile in an **ENE.** and **WSW.** direction about ½ mile to the southeastward of Cape Elizabeth lights. A buoy (can, black, "T. R." in white letters) is placed about 60 yards to the southeastward of the eastern end of the reef. Vessels entering should leave this buoy on the port hand.

Alden's Rock, **Corwin Rock**, and **Mitchell Rock** are described under Section 1 A.

A spot with 18 feet over it lies nearly ½ mile **E.** ½ **N.** from Cape Elizabeth east light-house.

Broad Cove Rock is a dangerous rock with 7 feet of water over it, lying off Broad Cove and about 1 mile **NNE.** ¾ **E.** from Cape Elizabeth east light-house. A spot with 18 feet of water over it lies a little over ¼ mile **NE.** from the rock. A buoy (can, black, "B. C. R." in white letters) is placed to the eastward of the rock; it should be left on the port hand by vessels entering.

Trundy's Reef extends about ⅞ mile to the northeastward from Trundy's Point, the point 2¼ miles **S.** from Portland Head light-house. For ¼ mile from the point the reef shows bare at low water, and outside of this it has 11 to 17 feet of water over it. A buoy (nun, black, "T. R." in white letters) is placed east of the northern end of the reef and bears **S.** by **E.** ⅜ **E.**, distant about 1¾ miles from Portland Head light-house.

Willard Rock and Pine Tree Ledge are described under Section 1 A.

Jordan's Reef is described under Section 1.

2. *Entering, and to an anchorage.*—When the bell-buoy off Cushing Island bears **E.**, distant about 400 yards, steer about **N.**, heading for the western angle of Fort Gorges. When the eastern angle of Fort Preble bears **SW.** steer **NE.** and anchor to the southeastward of Fort Gorges, within the anchorage limits prescribed in the harbor regulations in Appendix II.

Or, if bound to the quarantine anchorage, when on the **N.** course, and Portland Breakwater light bears **W NW.**, steer **N NW.** ¼ **W.**, giving the western side of Fort Gorges a berth of about 500 yards. Anchor to the northward of a line from Fish Point to Fort Gorges in 5 to 7 fathoms, soft bottom.

Or, if bound into the Upper Harbor, on the **N.** course, when the eastern angle of Fort Preble bears **SW.**, steer **NW.**; give the Breakwater light a berth of 500 yards and steer **W NW.** ½ **W.** toward the wharves of Portland. Haul to the southwestward and stand into the harbor, giving the wharves a berth of 200 yards. Anchor on the eastern edge of the channel within the limits prescribed in the harbor regulations in Appendix II.

Remarks.—When the course is changed to **N.**, **Fort Gorges**, a granite structure with base in the water, will be ahead; **House Island**, at the southwestern end of which is Fort Scammel, will be on the starboard bow and **Fort Preble** opposite on the port bow; **Fish Point**, the eastern point of the peninsula on which the city of Portland is built, will be seen in line and to the northward of Fort Preble. Standing in on the **N.** course, Portland Head light will be a little on the starboard quarter, Portland Breakwater and the light-house at its end will be opened from behind Fort Preble, and the city of Portland will be opened to the westward. The hotels and summer houses on Peak's Island will show conspicuously between Cushing and House islands; they will be shut out by House Island and opened again when past the latter. **Hog Island Roads** lie on the eastern side of the channel between Fort Scammel and Fort Gorges

Dangers.—**Shoals** make out nearly 400 yards, in some places, from the eastern shore of Cape Elizabeth abreast Cushing Island.

Mill Rock is a detached ledge with 2 feet of water over it lying about 150 yards to the northeastward of the southern point of **Simonton's Cove**, the cove on the Cape Elizabeth shore south of Fort Preble. A buoy (spar, black, No. 1) is placed to the northeastward of the rock.

Shoals make off about 130 yards to the westward from the southern point of House Island, and about 350 yards to the northward from the north side of Cushing Island.

Spring Point Ledge makes out about 350 yards in a **NE.** by **N.** direction from Spring Point, the point on which Fort Preble is built. This ledge shows partly bare at three-fourths ebb, and is marked by a buoy (can, black, "S. P. L." in white letters) placed about 200 yards **NE.** from the ledge.

A Ledge makes off from the northern point of Cape Elizabeth. Portland Breakwater is built on the ledge, and at present (1891) extends out to the 6-foot curve. A buoy (nun, black, "S. L." in white letters) is placed 120 yards **NE. ¾ N.** from the light-house, on the edge of the 12-foot curve.

Hog Island ledge is the large ledge, showing partly bare, on the southern side of which Fort Gorges is built. The ledge extends about 400 yards to the westward of the fort and the same distance to the northward of it. In a northeasterly direction it extends about 600 yards from the fort.

A shoal, with 12 to 14 feet over it at extreme low water, lies north of House Island in Hog Island Roads. To avoid this shoal when standing into Hog Island Roads, keep the southwestern end of House Island bearing to the eastward of **S.** until the north end of House Island bears to the southward of **SE.** by **E.**

Shoal water makes out from the Cape Elizabeth shore abreast the city of Portland. About midway between the Breakwater light and the draw in Portland bridge, near the edge of the channel and just to the northwestward of some rocks with 4 feet of water over them, is a buoy (spar, black, No. 3).

COAST FROM CAPE ELIZABETH TO PORTSMOUTH, N. H.†

This stretch of coast extends about 37 miles in a general **SW.** direction from Cape Elizabeth, with but few harbors indenting it, they being principally the resort of fishermen and small coasters seeking shelter in bad weather. The principal harbors are treated separately under their respective headings. Richmond's Island Harbor (see heading) is the only anchorage that can be safely used by vessels of over 12 feet draught, but it is exposed to southeasterly and southerly winds.

Between Richmond's Island and Wood Island light, a distance of 6¼ miles, the shore-line has more of a westerly trend, and forms a large open bight, the southern part of which is **Saco Bay**. **Prout's Neck**, a prominent point, nearly 3 miles west from Richmond's Island, is the northern point of Saco Bay. The shore of the bay is known as **Scarboro Beach**, **Old Orchard Beach**, and **Ferry Beach**, in the order named from the northward. The large hotels at Old Orchard Beach form a prominent landmark for vessels passing near the coast. **Stratten** and **Bluff** islands lie in the entrance of Saco Bay about 2¾ miles **N NE. ½ E** from Wood Island light-house; they are connected by shoals and rocks, but there is good water between them and Prout's Neck. In the southern end of Saco Bay is the entrance to **Saco River** and the small anchorage known as Wood Island Harbor (see heading "Saco River").

Between Wood Island light and Goat Island light, a distance of 7¼ miles, the shore has a general **SW. ½ W.** trend, and is broken by a number of small unimportant coves. **Timber Island**, about 2½ miles **NE. ½ N.** from Goat Island light-house, is the northern point of **Goose Fair Bay**, a shallow cove full of rock and ledges. **Cape Porpoise** is the easternmost of the islands lying north of Goat Island light; it is also known as **Cape Island**. **Stage Island Harbor** is a small slough to the northwestward of Cape Island that is used as a harbor of refuge by fishermen and small local craft.

Between Goat Island light and Cape Neddick light, a distance of 13¾ miles, the shore-line is broken by a number of small shallow streams, the most important of which is Kennebunk River (see heading). The trend of the coast for a distance of about 5 miles is **W.** from Goat Island light, and forms a broad open bight, the shore of which is known as **Wells Beach**.

The village of Ogunquit, a part of the township of Wells, is at the southern end of the beach. **Bald Head Cliff** is a high prominent point about 3½ miles **N NE. ½ E.** from Cape Neddick; just to the northward of the latter is a small anchorage known as Cape Neddick Roads, which is sometimes used by small local craft.

Cape Neddick is a prominent headland extending out about 1 mile from the main shore; off its eastern end is a small islet, **Cape Neddick Nubble**, on which is **Cape Neddick light**. A little over 5¾ miles **SE. ½ E.** from Cape Neddick light-house is **Boon Island light**, situated on a small rocky islet. This is one of the important off-shore lights on the coast of Maine, and can be left on either hand by passing vessels; those bound to the eastward of the light either give it a berth of ¼ to 1¼ miles, or they pass at least 3½ miles to the eastward to avoid Boon Island Ledge which has 3 feet over it and is marked by a whistling buoy. Passing to the westward of Boon Island light it should be given a berth of at least 1¼ miles to avoid Pollock Rock.

Between Cape Neddick light and the entrance to Portsmouth Harbor, a distance of a little over 8¼ miles, the shore has no marked indentations except York River entrance (see heading). Lying off shore about 2½ miles are two dangerous ledges; the northernmost of these bears **SE.** by **S.** from York River entrance, distant about 2¾ miles. There are spots with 3¼ to 6 fathoms over them between the southernmost ledge (Murray's Rock) and the mainland. **York Beach** is between Cape Neddick and York River entrance; it is a much frequented summer resort and has several large hotels and a number of summer cottages a short distance from the shore.

† Shown on Coast and Geodetic Survey charts: 107, 108, scale of each $\frac{1}{80,000}$, price of each $0.50; and 6b, scale $\frac{1}{400,000}$, price $0.50.

RICHMOND'S ISLAND HARBOR.†

This harbor, which is formed by the northern shore of Richmond's Island and a breakwater from the island to the mainland of Cape Elizabeth, is about 2½ miles to the southwestward of Cape Elizabeth lights. It is an excellent anchorage, affording shelter from winds from **W.** to **SE.** through **N.**, and is frequently used by vessels bound to Portland when they cannot enter that harbor on account of a head wind. The entrance between the western point of Richmond's Island and **Ram Island**, a small island near the southern shore of Cape Elizabeth, is about ⅞ mile wide and has a depth of 7 to 8 fathoms. This depth gradually decreases in a northeasterly direction toward the head of the harbor, where in ranges from 10 to 24 feet. The bottom is sand and clay. The principal dangers are marked by buoys, and in clear weather in the daytime the anchorage may be made by vessels of the largest class. On indications that the wind will veer to the southward of **E.** vessels should stand out of the harbor. The mean rise and fall of tides is 8.6 feet.

SAILING DIRECTIONS, RICHMOND'S ISLAND HARBOR.

1. ***From the Eastward.***—When to the northward of West Cod Ledge, shape a course so as to pass about 1 mile to the eastward of Cape Elizabeth east light. Leave Taylor's Reef buoy (can, black, "T. R." in white letters) ¼ to ½ mile on the starboard hand and steer **SW.** by **W.** ½ **W.** When the western end of Richmond's Island bears **NW.** by **W.**, steer about **W NW.** and give the shore and western point of Richmond's Island a berth of at least ¼ mile. When Cape Elizabeth opens to the northward of Richmond's Island and bears about **E.** by **N.**, steer for it on this bearing and anchor in 4 to 8 fathoms water, when the western point of the island bears to the southward of **SE.**

Beating in to the anchorage, give the southern and western shores of Richmond's Island a berth of at least ¼ mile. When standing to the westward beware of Old Proprietor, and do not approach the shore of Cape Elizabeth between Prout's Neck and the entrance of the harbor closer than 1 mile. Standing into the harbor the northern shore should not be approached closer than ⅜ mile to avoid Chimney Rock. When past this rock a **N.** by **E.** course will lead to the head of the harbor in about 4 fathoms water.

Remarks and Dangers.—Wood Island light kept bearing to the westward of **SW.** ½ **S.** will clear the ledges making to the eastward from Stratten Island and also Old Proprietor.

Old Proprietor is a ledge showing bare at half tide; it lies a little over 1¾ miles **W.** by **N.** from the western end of Richmond's Island and is marked off its southeastern end by a buoy (spar, black No. 1). About ½ mile **N NE.** from Old Proprietor is a shoal spot with 11 feet of water over it.

Chimney Rock is awash at low water and lies ⅝ mile **N NW.** ½ **W.** from the western point of Richmond's Island. A buoy (spar, black, No. 3) is placed off the southeastern side of the rock, which is left on the port hand when entering.

The Brothers are three small bare rocks surrounded by ledges about ⅛ mile **NE.** by **N.** from Chimney Rock; they are not in the way of vessels entering, but vessels anchoring in the northern part of the harbor should be careful to avoid them.

There is a spot with 16 feet over it about 300 yards to the eastward of Chimney Rock.

1 A. ***From the Southwestward.***—Keep at least 1¼ miles to the eastward of Fletcher's Neck and Wood Island light. When to the northward of the light bring it to bear **SW.** ¼ **W.** and steer **NE.** ¼ **E.**; this course will lead a little over ¾ mile to the eastward of Stratten Island, about 1 mile to the eastward of Old Proprietor and up to the anchorage in the harbor.

See also the directions for beating and the remarks and dangers under Section 1, preceding.

SACO RIVER.‡

This is a narrow crooked stream with a least depth of 3 feet in the channel at low water; it extends in a northwesterly direction about 3½ miles to the cities of **Biddeford** and **Saco**, the former on the south bank of the river and the latter opposite on the north bank. Above the cities the river is not navigable for vessels of any size. The entrance is marked by **Wood Island light** (see table of lights page 112) which bears **SW.** ¼ **W.**, distant 8¼ miles from Cape Elizabeth light-houses, and **NE.** ¼ **E.**, distant 7¼ miles from Goat Island light-house; it is much obstructed by rocks, ledges, and small islands, between which is an anchorage called **Wood Island Harbor.** Many of the dangers are marked, but a stranger should not attempt to enter the river without a pilot or tow-boat.

A stone jetty, which extends in an easterly direction from the north point at the entrance to the river, is being built under the supervision of the U. S. Engineers; it is proposed to build the jetty out to Sharp's Rock. The deep-

† Shown on Coast and Geodetic Survey charts: **327**, scale $\frac{1}{20,000}$, price $0.20; and **106, 107**, scale of each, $\frac{1}{80,000}$, price of each $0.50.

‡ Shown on Coast and Geodetic Survey charts: **106** and **107**, scale of each $\frac{1}{80,000}$, price of each $0.50.

est draught vessels that enter here draw 12 feet; 9 to 10 feet is the usual draught. There is from 4 to 10 feet of water alongside the wharves at low water. The channel has 3 feet of water on the bar at low water and is very narrow and crooked. The only **anchorage** is off the mouth of the river in Wood Island Harbor. This has from 13 to 21 feet of water, but is exposed to easterly winds. The best shelter is just to the northward and westward of Phillip's Rock spindle.

Wood Island Harbor is to the southward of Wood Island. Between it and Fletcher's Neck it is very narrow, but much frequented by fishermen in bad weather, who often lie here so close as to make fast to one another. There are numerous rocks off the entrance and in the harbor; the principal ones are marked.

The Pool, or **Biddeford Pool**, is a shallow bay making to the southwestward inside of Fletcher's Neck. The entrance is very narrow and entirely unfit for a stranger to enter, although vessels well acquainted with the locality sometimes anchor just inside; they are usually of light draught.

Pilots.—Strangers entering Wood Island Harbor or bound into the river should take a pilot; vessels usually signal 2 miles from Wood Island light and pilots come out to them.

Tow-boats.—Vessels bound into the river take a tow-boat, which will be found near the entrance; if over 400 tons capacity a pilot should be employed in addition to the tow-boat to steer the vessels up the river. Those of less than 400 tons capacity generally are taken up by the tug without a pilot.

Supplies.—A limited quantity of anthracite and bituminous coal for steamers can be obtained alongside the wharves at Biddeford and Saco. Fresh water can be taken from the river at Saco. Provisions and ship-chandler's stores can be had in either city.

Ice closes the river from January to April each year.

Tides.—The mean rise and fall of tides is 8.9 feet. See also the table on page 116.

SAILING DIRECTIONS, TO THE ANCHORAGE IN WOOD ISLAND HARBOR.

These directions are good for a draught of 11 feet or less in the daytime. In bad weather this harbor is usually crowded with small coasters and fishermen, so that it would be difficult for a stranger to get a berth. Vessels bound into Saco River can take a pilot or tow-boat from the anchorage in Wood Island Harbor.

1. ***Approaching and Entering.—From the Northward and Eastward.***—When Cape Elizabeth lights bear to the eastward of **N.**, steer for Wood Island light, bearing between **SW.** by **W.** ½ **W.** and **W.** When 1 mile distant from the light-house steer more to the westward so as to pass ½ mile to the northward of Wood Island; bring the monument on Stage Island to bear **W. SW.**, and steer for it on this bearing. Pass about midway between Negro Island Ledge buoy and Ram Island Ledge buoy, and when Negro Island Bar buoy (spar, red, No. 4) bears about **S. SW.**, steer so as to leave it about 150 yards on the port hand. Anchor about midway between Negro (Tappan) Island and Stage Island in 15 to 18 feet water, soft bottom.

Remarks.—Approaching Wood Island light Fletcher's Neck will be seen to the southward and a number of small islands to the westward. Negro Island Ledge buoy should be looked for and left on the port hand. **Negro (Tappan) Island** is a small rocky islet about 200 yards to the westward of Wood Island; between this island and **Stage Island**, the next island to the westward, marked at its northeastern end by a stone monument, is the anchorage known as **Wood Island Harbor**. To the northwestward from Stage Island monument is the breakwater and entrance to Saco River. The village on Fletcher's Neck, "**Biddeford Pool**," is to the southwestward of the anchorage.

Dangers.—**Ram Island Ledge** is about 450 yards long in an **E.** and **W.** direction and has a depth of 9 feet over it. A buoy (spar, red, No. 2) is placed about 50 feet south of the ledge near its eastern end and bears **NW.** from Wood Island light-house, distant about ⅞ mile.

Negro Island Ledge is about 150 yards in diameter and has a depth of 9 feet over it; off its northeastern side it is marked by a buoy (spar, black, No. 1) which bears **NW.**, distant ½ mile from Wood Island light-house.

Negro Island Bar is a shoal making out about 350 yards to the southwestward from Negro (Tappan) Island; at its southwestern point it is marked by a buoy (spar, red, No. 4) which is colored and numbered for the passage south of Wood Island.

Stage Island Point is a dangerous reef which makes out about 300 yards **ENE.** from the northeastern point of Stage Island, and is bare for more than half its length at low water. The flood current sets across this reef, and vessels should give the northeastern point of Stage Island a berth of 350 yards to clear it.

Sharp's Rocks show bare at half tide, and lie a little over ⅝ mile **N.** by **W.** ½ **W.** from the monument on Stage Island. A buoy (spar, red, No. 6) is placed just to the southward of the rocks, which extend about 350 yards in an **E.** by **S.** and **W.** by **N.** direction. This buoy is left on the starboard hand by vessels bound up Saco River.

1 A. ***Approaching and Entering.—From the Southward.***—When about 2 miles to the southward of Wood Island light bring it to bear **N.** ¼ **W.** and steer for it on this bearing. Dansbury Reef buoy should be made a little on the starboard bow and left about 150 yards on the starboard hand. When this buoy bears **E.** steer **N NW.** and pass about 175 yards to the east-

ward of the northeastern point of Gooseberry Island. When the point bears **SW.** steer **W NW.** ½ **W.**, keeping Negro Island Bar buoy a little on the starboard bow. When abreast of this buoy, which should be left about 60 yards on the starboard hand, steer more to the northward and anchor about midway between Negro (Tappan) Island and Stage Island in 15 to 18 feet, soft bottom.

Remarks.—Standing for Wood Island light on the **N.** ¼ **W.** course, Fletcher's Neck and the life-saving station on its eastern side will be on the port bow. When abreast Dansbury Reef buoy Washman's Rock will be left about 200 yards on the port hand. **Gooseberry Island**, lying south from the western end of Wood Island, is left on the port hand; the channel leads between the two islands. On the **W NW.** ½ **W.** course the monument on Stage Island will be on the starboard bow and the southern end of **Basket Island**, small island to the westward of Stage Island, will be ahead. When standing to the northward, after having passed Negro Island Bar buoy, care should be taken not to be set on to Stage Island Point.

Dangers.—**Huzzey's Rock** has 7 feet of water over it and lies nearly 1⅝ miles **SW.** by **S.** from Wood Island light-house; it is marked by a buoy (spar, black, No. 1) placed 900 yards **S.** from the rock.

A number of rocks and ledges extend about ⅝ of a mile to the eastward and southeastward from Fletcher's Neck, abreast the life-saving station. **Beach Island**, a small low islet, and **Whale's Back**, a ledge with 3 feet over it, are the most prominent of these dangers. Vessels coming from the southward avoid these by keeping Wood Island light bearing to the westward of N.

Washman's Rock is a bare rock lying 400 yards **SE.** by **E.** ½ **E.** from the eastern point of Fletcher's Neck; it should be left at least 100 yards on the port hand by vessels entering.

Dansbury Reef has a depth of 5 feet over it and lies about ½ mile **S.** ¾ **E.** from Wood Island light-house. At its southern end is a buoy (spar, red, No. 2) which should be left on the starboard hand by vessels entering. There are several shoal spots between the reef and Wood Island, and strangers should not enter between them.

There are several half-tide rocks lying off the northern shore of Fletcher's Neck to the westward of Gooseberry Island. These can be avoided by giving the shore a berth of at least 350 yards until up to Negro Island Bar buoy.

Half-tide Rock lies about ⅝ mile **S.** from the monument on Stage Island and on the south side of the slough leading into Biddeford Pool; it is marked by a spindle (iron, black, cage on top).

CAPE PORPOISE HARBOR.†

This is a small narrow and irregular inlet lying between the islands and rocks to the westward of Goat Island light; it is much used as a harbor of refuge by fishermen, who, during bad weather, occupy the whole of the anchorage. The depth into the anchorage is 11 feet at low water, but the smaller vessels will sometimes anchor on the flats on the western side of the channel where they lie aground in the soft mud at low water. Vessels of over 100 tons should not attempt to enter the harbor, and it is advisable for strangers to run either for Portland or Portsmouth if caught in a blow. Vessels of 9 feet or less draught may stand into the anchorage by closely following the directions.

GENERAL DIRECTIONS, CAPE PORPOISE HARBOR.

When Goat Island light is about ¾ mile distant bring it to bear **N.** by **W.** ½ **W.** and steer for it on this bearing. Old Prince buoy (can, red, No. 2) should be made on the starboard bow and left about 50 yards on the starboard hand; when this buoy bears about **E.** steer **NW.** ¾ **N.** and pass close to Goat Island Point buoy (spar, red, No. 4), leaving it on the starboard hand. Continue the **NW.** ¾ **N.** course about 200 yards past red spar buoy No. 4 and then steer about **N.** ¼ **W.**, following the narrow slough which here forms the anchorage. Anchor in 11 to 15 feet of water, or, if of light draught and the tide will permit, stand to the westward and anchor on the flats so as to lie aground at half tide.

KENNEBUNK RIVER.†

This is a small stream about 2¾ miles to the westward of Cape Porpoise; it is the approach by water to Kennebunkport, but is of little commercial importance. The entrance is between two stone piers that were built to improve the channel, which has a depth of 3 feet at low water. Vessels of 12 feet draught are taken to the wharves of the town at high water under favorable conditions. There is no anchorage off the entrance that affords shelter; the **Fishing Rocks** are a dangerous obstruction to the approach. Strangers should not attempt to enter the river without a pilot; when approaching the entrance, signal should be made for one and the vessel kept at least 1 mile off shore until boarded.

The town of **Kennebunkport** is at the head of navigation, about ¾ mile above the entrance of the river; one of its industries is ship building. A limited amount of anthracite coal, water, and provisions can be had at the wharves of the town, alongside of which there is a depth of 5 feet at low water.

Sailing directions of practical value for entering the river cannot be given.

† Shown on Coast and Geodetic Survey chart: 107, scale $\frac{1}{80,000}$, price $0.50.

YORK RIVER.†

This river is the approach by water to **York Village**; it is sometimes used as a harbor of refuge by small coasting and fishing vessels, but the anchorage is small and difficult of access, and a stranger should not enter without a pilot. The entrance, between East Point on the north and Argo Point on the south, lies about 2½ miles to the southwestward of Cape Neddick and is somewhat obstructed by ledges which are marked by buoys. Inside the entrance the prominent dangers are marked by buoys up to Stage Neck, but above this there are no aids. The channel is narrow and crooked and the tidal currents run with great velocity, the ebb nearly 5 knots and the flood nearly 3½ knots at strength during spring tides. The channel is being improved; it is proposed to widen it by the removal of ledges in its narrowest parts and deepen it to 10 feet at low water as far as York Village. There is now (1891) about 8 feet at low water in the channel, and the deepest draught taken to York Village, about ⅞ mile above the mouth of the river, is 15 feet; 9 feet is the deepest draught that can be taken to Scotland, at the head of navigation. Three bridges cross the river above the village; the width of the draws is 27 to 30 feet.

Pilots for York River can be obtained by making signal outside the entrance and lying off and on until boarded. The most favorable time for entering is on the flood tide.

Ice closes the river to navigation in severe winters.

The mean rise and fall of tides is about 8½ feet.

GENERAL DIRECTIONS TO THE ENTRANCE OF YORK RIVER.

1. ***From the Northward and Eastward.***—When Cape Neddick light is made, shape a course so as to pass about 1 mile to the southeastward of it. When the light bears **NW.**, distant 1 mile, steer **SW. ¾ S.** about 2¼ miles, leaving East Point Ledge buoy (spar, red, No. 2) about ⅜ mile on the starboard hand. The entrance to the river will then be off the starboard bow and a **W NW. ½ W.** course should lead between Sweat's Point Reef buoy (spar, black, No. 1) and Black Rocks buoy (spar, red, No. 4). A stranger should take a pilot outside these buoys.

Or, having passed about 1 mile to the northward of Boon Island light, bring it to bear **E SE. ½ E.** astern and steer **W NW. ½ W.**, keeping the bearing. Pass nearly ¼ mile south of East Point Ledge buoy (spar, red, No. 2) and take a pilot. The entrance will be directly ahead.

1 A. ***From the Southward and Southwestward.***—Pass at least 1½ miles to the eastward of the Isles of Shoals, and when Duck Island, the northernmost island, bears **W.**, distant 1½ miles, steer **N. ½ W.** Leave Murray's Rock buoy (nun, red and black horizontal stripes) ½ mile on the port hand and York Ledge Spindle about the same distance on the starboard hand. East Point should be ahead; when the point is distant about ¾ mile the buoys at the entrance will be made on the port bow and a pilot should be taken.

Or, standing along shore, when to the eastward of Whale Back light, at the entrance to Portsmouth Harbor, stand to the northeastward, giving the shore a berth of ¾ mile to 1¾ miles. When Cape Neddick light is made steer **NE.** by **N.**, heading for it on this course, and when York River entrance is open broad on the port bow, steer for it and take a pilot.

Remarks.—East Point, the northern point at the entrance, has a number of summer houses. A large, yellow hotel on the south side of the river and some distance back from the beach, forms a conspicuous mark to recognize the entrance.

PISCATAQUA RIVER AND PORTSMOUTH HARBOR.‡

This harbor, lying about 37½ miles **SW. ¼ W.** from Cape Elizabeth and about 25 miles **N.** from Thatcher Island (Cape Ann lights), is the only harbor of refuge for deep draught vessels between Portland, Me., and Gloucester, Mass. The entrance is marked by **Whale Back light** and fog signal (see table page 112), and the most prominent outlying dangers are marked, so that no difficulty should be experienced when entering in clear weather, either in the daytime or at night. **Portsmouth Harbor** is formed by the mouth of the Piscataqua River, and is the approach to the cities of Portsmouth and Dover and the towns of Newcastle, Kittery, South New Market and Exeter; on the north side of the harbor, opposite the city of Portsmouth is the U. S. Navy Yard.

The Piscataqua River has several branches, the principal ones being the **Cocheco River**, and **Great Bay** and **Exeter River** also known locally as the "Exeter and South New Market Branch." These are navigable at high water for vessels up to 10 feet draught, but a tow-boat and local knowledge are necessary. On the western side of the entrance, about **W.** from Whale Back light, is the entrance to **Little Harbor**; this is a large, shallow body of water which is sometimes used as an anchorage by small craft, but is of no present importance to navigation.

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† Shown on Coast and Geodetic Survey charts: **328**, scale $\frac{1}{20,000}$, price $0.15; and **108**, scale $\frac{1}{80,000}$, price $0.50.

‡ Shown on Coast and Geodetic Survey chart: **329**, scale $\frac{1}{20,000}$, price $0.20; and **108**, scale $\frac{1}{80,000}$, price $0.50.

The city of **Portsmouth** has a large trade in coal and lumber, carried principally in the larger class of coasting vessels, which are taken alongside the wharves from the anchorage by tow-boats; it is connected with the town of Kittery by a drawbridge. The least depth in the channel entering the harbor is about 6½ fathoms, but above Fort Constitution the depths range from 8 to 12½ fathoms and the tidal currents are very strong. Vessels of 23 feet draught can lie afloat at the principal wharves in the city.

Kittery is a small town on the north side of the harbor opposite Portsmouth; it is connected with the Navy Yard, which is on an island, by a drawbridge. The town is of no commercial importance, almost everything used being brought from Portsmouth.

Newcastle is a village on the south side of the harbor to the westward of Fort Constitution; it is of no importance, and is reached from Portsmouth by crossing several bridges which connect the islands on the south side of the harbor.

Dover is an important manufacturing city on the Cocheco River, about 12 miles above the city of Portsmouth; it has a considerable trade in coal and heavy merchandise and can be reached at high water by vessels of 10 feet draught. The channel is narrow and crooked and requires local knowledge and the assistance of steam; it is being improved under the supervision of the U. S. Engineers. There is about 4 feet of water alongside the wharves at low water, and the mean rise of tides is about 6½ feet. A bridge with a draw about 35 feet wide has to be passed just above the city of Portsmouth.

South New Market and **Exeter** are two manufacturing towns on the Exeter River, the former about 17 miles and the latter 22 miles above the city of Portsmouth; they have some trade in coal and can be reached at high water by vessels of 10 feet draught. The channel through Great Bay and in the Exeter River is narrow and crooked, and is navigable only for vessels assisted by steam. Three bridges have to be passed; the least width of the draws is about 30 feet. Vessels when loaded must lie aground at the wharves at low water.

Prominent Features.—Boon Island light and the Isles of Shoals are the off-shore aids lying to the eastward of Portsmouth entrance. **Whale Back light** is on the eastern side at the entrance. **Portsmouth Harbor (New Castle) light** (see table of lights, page 112) is on the western side of the harbor, above Whale Back light, where the channel makes a sharp bend to the westward. **Fort Constitution** is the unfinished granite structure near Portsmouth Harbor light.

Pilots.—There are no branch pilots for Portsmouth Harbor; vessels, if bound to any of the towns on the Piscataqua River or its branches, take a tow-boat from the anchorage. A pilot is not necessary in clear weather when the aids can be seen. See also pages 182, 183.

Tow-boats are on the lookout for vessels expected to arrive; and if the tide is slack will tow alongside the wharves without any delay. A vessel desiring a tow-boat while outside Whale Back light can obtain one by making the usual signal (flag in rigging).

Anchorages.—The anchorage is anywhere on the sides of the channel between **Wood Island**, the island north of Whale Back light, and **Clark's Island**, the small high inland on the north side about ¾ mile above Fort Constitution. With a southerly wind the best anchorage is above Fort Constitution on the south side of the channel. The bottom is generally clay and good holding ground. There is no anchorage above Clark's Island, except for small craft. Just to the westward of Seavey's Island and close to the Navy Yard is an anchorage for a limited number of vessels, but care must be taken not to get too near the moorings which extend out some distance from the Navy Yard, and from the large, black mooring buoys.

Harbor Regulations.—The harbor master of the city of Portsmouth has authority to regulate any controversy among the vessels in the harbor (see Harbor Regulations, Appendix II).

Quarantine Regulations.—The board of health of the city of Portsmouth has jurisdiction over the harbor of Portsmouth (see Quarantine, Appendix II).

Marine Hospital.—Medical attendance is furnished seamen from U. S. vessels by an acting assistant surgeon of the U. S. Marine Hospital Service. See also Appendix IV.

Supplies.—Coal can be obtained at the wharves, water from a water-boat or alongside the wharves, and ship chandler's stores in the city of Portsmouth.

Repairs.—There is one small marine railway at Kittery, Me.; its capacity is limited to small craft. Sailing vessels and steamers requiring repairs to hull or machinery usually go to Portland or Boston.

Wind Signals of the U. S. Signal Service are shown from a building corner of Daniel street and Market square, and can be readily seen by the shipping in the harbor.

Ice.—In ordinary winters Portsmouth Harbor is free from ice, but during severe winters there is considerable drift ice which comes down the river with the ebb current; it is seldom an obstruction to navigation and never interferes with vessels at anchor below Clark's Island.

Tidal currents.—The tidal currents are strong and require special care. It is slack water about 2 hours after high and low waters and the duration of the stand is about 10 minutes. The current attains its maximum velocity

about 2 to 3 hours after slack water. No systematic observations of the currents have been made to determine their velocity.

The mean rise and fall of tides is 9.2 feet; for other tidal data see the table on page 116.

SAILING DIRECTIONS, PORTSMOUTH HARBOR.

These directions if closely followed will lead in to the anchorage with a least depth of 7 fathoms. Sailing vessels passing above the anchorage should take a tow-boat.

1. ***Approaching and Entering.—From the Northward or Northeastward.***—Standing along shore as directed in Section 5, page 25, and having passed about 2 miles to the westward of Boon Island light, continue the **SW. ¼ W.** course until Whale Back light bears **W.** by **N.**, and then steer **W.** This course should lead a little to the southward of the bell-buoy off Kitt's Rocks. Leave the bell-buoy on the starboard hand and stand to the westward until Portsmouth Harbor (New Castle) light bears **N. ¾ W.**, when it should be steered for on that bearing. When Whale Back light is well abaft the starboard beam change course to about **N. ½ E.** so as to pass about 350 yards to the eastward of Portsmouth Harbor light, and when the latter bears well abaft the port beam steer about **NW.** and anchor on the north side of the channel in 8 to 13 fathoms water, clay bottom.

If a steamer, and bound to Portsmouth, follow the directions in Section 2.

Remarks.—On the **SW. ¼ W.** course, when Whale Back light bears **W.** by **N.**, Murray's Rock buoy should be distant about 1 mile on the starboard hand. To avoid the dangers to the eastward of Whale Back, give the shore a berth of ⅔ mile. The red fog-signal structure close to Whale Back light is a prominent mark in the daytime. Entering on the ebb current care should be taken not to be set to the eastward too close to Whale Back and Wood Island. The bell-buoy tails to the eastward on the ebb, and to the northwestward on the flood. On the **N. ½ E.** course Stielman's Rocks buoy will be left about 400 yards on the port hand. **Fort Constitution**, an unfinished granite structure, will be seen close to Portsmouth Harbor light. In light winds vessels should not stand too close to Portsmouth Harbor light.

Dangers.—**York Ledge** and **Murray's Rock** are described on page 26. A number of rocks and ledges, some of them showing bare at low water, extend in a broken line about 1½ miles to the eastward of Whale Back light and about ¾ mile from the shore. They are known, respectively, as the **East Sister**, **West Sister**, **Phillip's Rocks**, **White Island Reef**, and **Kitt's Rocks**, and are avoided by giving the shore a berth of ⅔ mile. A buoy (spar, red, No. 2) is placed to the southward of the **West Sister** and bears **E. ¾ S.**, distant nearly 1¼ miles from Whale Back light. A bell-buoy is placed ⅝ mile to the southward of Kitt's Rocks and bears **S.** by **E.** from Whale Back light, distant nearly ¾ mile.

Stielman's Rocks extend about 350 yards from the shore to the southward of Portsmouth Harbor light; a buoy (nun, black, No. 3) is placed on the eastern end of the rocks. The shore between the entrance to Little Harbor and this buoy should be given a berth of at least 300 yards.

Shoals make out 250 yards to the westward and southwestward from Wood Island.

Fishing Islands are two small rocky islets lying on the north side of the channel **NE.** from Portsmouth Harbor light. **Fishing Island Ledge** is bare at low water and extends to the westward from the islands. A buoy (spar, red, No. 4) is placed off the western end of the ledge.

Cod Rock has 16 feet over it and lies about 250 yards **NW.** from Fort Constitution; it is marked by a buoy (spar, black, No. 5).

1 A. ***Approaching and Entering.—From the Southward.***—Bring Straitsmouth light to bear **W SW.**, distant 2 miles, and steer **N. ¼ W.** about 23½ miles. This course will lead 1¾ miles to the westward of Isles of Shoals light and fair for Portsmouth Harbor light.

Or, from a position ¾ mile to the southwestward of Isles of Shoals light, steer **N.** by **W.**, heading for Portsmouth Harbor light, and passing well to the westward of the bell-buoy and Whale Back light.

When Whale Back light bears **E.**, distant about ¼ mile, steer about **N. ½ E.** so as to pass about 350 yards to the eastward of Portsmouth Harbor light, and when this light is well abaft the beam, steer about **NW.** and anchor on the north side of the channel in 8 to 13 fathoms water, clay bottom.

If a steamer, and bound to Portsmouth, follow the directions in Section 2.

Remarks.—On the **N. ¼ W.** and **N.** by **W.** courses the entrance of the harbor is directly ahead, and Whale Back light should be made a little on the starboard bow. See also the remarks under Section 1, preceding.

Dangers.—**Gunboat Shoal** has a least depth of 3½ fathoms over it, and lies 2¼ miles **S.** by **W. ¼ W.** from Whale Back light-house and about 1 mile from the shore. It is about ¼ mile long in a **NE.** and **SW.** direction, and is not marked. A good rule to follow is to give the shore to the southward of Gunboat Shoal a berth of at least 1 mile, and when to the northward of the shoal to give the shore a berth of over ¼ mile until past the entrance to Little Harbor. See also dangers under Section 1, preceding.

2. ***From Fort Constitution to the city of Portsmouth.—Note.***—Vessels should not go above Clark's Island unless they are sure of a berth at some wharf. The anchorage off the Navy Yard is small; there is no anchorage for large vessels; neither is there room for a vessel to turn in the channel when the current is running.

I. On the flood.—When Fort Constitution bears S., steer about W. ½ N., heading for the southwestern point of Seavy's Island; pass about midway between Clark's Island and the south shore, keeping in the axis of the current. When up to the southeastern end of Seavy's Island, leave it about 100 yards on the starboard hand and steer so as to pass about 75 yards south of the southwestern point of the island, taking care to leave Goat Island Ledge buoy (spar, black, No. 9) about 50 yards on the port hand.

Round the southwestern point of Seavy's Island, and head for the shears at the Navy Yard, permitting the current to set the vessel well over toward the shore of Pierce's Island so as to keep out of the strong eddies off the southwestern side of Seavy's Island. When Pumpkin Island beacon (red spar with diagonal braces and lozenge-shaped figure on top), which will be seen to the westward of the Navy Yard, bears N NW. ½ W., steer for it on the bearing. South Beacon Shoal buoy (spar, black, No. 11) should be left on the port hand, and when it is abaft the beam, steer about W NW. ½ W. for the coal wharves at the upper part of the city, keeping out of the eddies on both sides of the channel.

II. On the ebb.—Steer about the same courses as in entering on the flood, care being taken to keep in the axis of the current, so as to meet it head on. Passing south of Seavy's Island and rounding its southwestern point, great care is necessary as the current here is very strong, and if a vessel should take a sheer she would be likely to be set upon Goat Island Ledge (known also as Pull-and-be-damned Point) before she could be straightened to meet the current head on.

Dangers.—**Goat Island Ledge**, known also as **Pull-and-be-damned Point**, makes off about 150 yards to the northward from the eastern end of Goat Island. It is marked on its northern end by a buoy (spar, black, No. 9). This ledge is particularly dangerous on the ebb current, which sets directly on it. The buoy tows under water during the strength of the current.

South Beacon Shoal extends about 160 yards to the eastward from the stone beacon, with mast and shape on top, which is on the south side of the harbor, about W SW. from the Navy Yard shears. The northeastern edge of the shoal is marked by a buoy (spar, black, No. 11). About 70 yards north of the beacon is a 17-foot spot, and Gangway Rock, with a depth of 3¼ fathoms over it, lies 180 yards N NE. ¾ E. from the beacon.

Seward's Rocks lie to the westward of the stone beacon on the south side of the harbor; they are marked near their northern side by a buoy (spar, black, No. 13).

The northern side of the harbor, between the Navy Yard and Willey's Ledge spindle, is full of shoals.

ISLES OF SHOALS.†

This group of islands lies from 5 to 6 miles off shore to the southeastward of Portsmouth Harbor entrance and about 20 miles N. ¾ E. from Thatcher Island (Cape Ann lights). It comprises seven islands and a number of rocks and ledges, many of which are bare at low water. The group extends about 3 miles NE. ½ N. and SW. ½ S., and is marked at its southwestern end by **Isles of Shoals light** (see table, page 112). There are several channels between the islands, but they are used only by local fishermen, who sometimes seek shelter there in easterly winds.

Duck Island, the northernmost of the group, is nearly 5¼ miles SE. ½ S. from Whale Back light-house at the entrance to Portsmouth Harbor; it is low, rocky, and surrounded by ledges, and should be given a berth of ¼ mile.

Appledore Island, the largest of the group, lies about 1 mile to the southwestward of Duck Island; it is high and has a large summer hotel, the Appledore House, near the middle of the island, and a landing on its western side. The channel between Duck and Appledore islands has a depth of 10 to 15 fathoms except in one spot, where it is 6¾ fathoms.

Smutty Nose Island lies to the southward of Appledore Island, with a narrow channel between them having a least depth of 3¼ fathoms. There are several houses near the western end of this island and a small cove, **Haley's Cove**, where boats lie aground at low water.

Cedar Island is to the southward of Smutty Nose, and is connected with it by a ledge which is bare at low water; to the westward of this ledge is **Gosport Harbor**, a small anchorage used by fishermen during easterly winds.

Star Island lies to the westward of Cedar Island, a channel with 6 feet at low water separating them. On the northern side of the island are several hotels and a steamboat landing for the steamer plying to Portsmouth, N. H.

Lunging Island is a low, bare, rocky islet, surrounded by ledges and lying ¼ mile to the westward of Star Island. The channel between these islands is obstructed by rocks which are marked by a buoy.

White Island is the southernmost of the group and is marked by the light-house; ledges extend ¼ mile to the southwestward and westward from the island.

Anderson's Ledge, showing partly bare at low water and marked by a spindle, lies 1 mile SE. by E. ¼ E. from Isles of Shoals light-house, and is the farthest outlying danger. The ledge is about 200 yards in diameter and has good water all around it.

† Shown on Coast and Geodetic Survey charts: 230, scale $\frac{1}{20,000}$, price $0.20; and 108, scale $\frac{1}{80,000}$, price $0.50.

Cedar Island Ledge shows bare at low water and lies about ⅝ mile **SE.** from Cedar Island; it is about 300 yards long **E.** and **W.** and is surrounded by deep water.

REMARKS ON APPROACHING AND PASSING ISLES OF SHOALS.

The islands can be seen a distance of 10 miles on a clear day, the hotels being most prominent, and vessels passing to the westward can avoid all danger by giving them a berth of ¼ mile. Passing to the eastward care should be taken to avoid Cedar Island and Anderson's ledges; giving the islands a berth of 1¼ miles leads well clear. Isles of Shoals light covers the entire horizon, but the hotels on the islands to the northward shut the light out occasionally when approaching the islands from that direction. A stranger desiring to land on the islands should be guided by chart 330.

COAST FROM PORTSMOUTH HARBOR ENTRANCE, N. H., TO CAPE ANN, MASS.†

From Portsmouth Harbor entrance to Hampton Harbor, a distance of about 10 miles, the coast has a general **SW. ½ S.** trend, with no very marked indentations; it presents the appearance of a succession of sand beaches separated by ledges jutting out into the sea, with occasional hotels and summer houses back of the high-water line. **Rye Beach**, a summer resort, and **Rye Village** are about 5 miles from Portsmouth Harbor entrance. **Rye Harbor** is a small cove, almost entirely bare at low water, about 4 miles to the southwestward of Whale Back light. About ⅝ mile to the southward of the cove is a U. S. life-saving station. Lying about 5 miles off shore, between Portsmouth Harbor entrance and Rye Harbor, are the Isles of Shoals (see heading). **Hampton Beach** extends from Rye Beach to Great Boar's Head, a distance of 2½ miles; back of the beach is the village of **Hampton**. **Great Boar's Head** is a point making out ¼ mile at the southern end of Hampton Beach and about 1½ miles to the northward from Hampton Harbor entrance; it is about 40 feet high, and the eastern face presents a precipitous appearance; there are several hotels and a number of summer cottages on the head. **Hampton Harbor**, or **Hampton River**, is a shallow stream, only used by small local craft. Several dangerous ledges lie off its entrance, and 2½ miles **SE. ¾ S.** from Great Boar's Head is **Hampton Shoal Ledge**, which has a least depth of 19 feet over it.

From Hampton Harbor the shore extends about 4½ miles in a **S.** by **W. ¼ W.** direction to the entrance of Merrimack River (Newburyport Harbor), and is known as **Salisbury Beach**. Newburyport light, on the southern side of the entrance, inside the jetties, is the guide for entering the Merrimack River (see heading Merrimack River and Newburyport Harbor). There is a U. S. life-saving station on the beach just south of the entrance.

From Merrimack River entrance the shore trends **S. ¼ E.** about 7½ miles to the entrance to Plum Island Sound and Ipswich River, and is known as **Plum Island Beach**. There are no outlying dangers along this beach, and a depth of over 5 fathoms will be carried 1 mile from the shore. Ipswich light, on the southern side of the entrance to Ipswich River, is a prominent landmark (see heading Plum Island Sound and Ipswich Harbor).

Ipswich Bay is the bight between the northern point of Cape Ann and Plum Island Beach; between these points it is about 6 miles wide and makes in about 3 miles to the southward. The bay is the approach to Ipswich, Essex, and Squam rivers, and has a depth of 4 to 15 fathoms except in its southern and southwestern sides, where the shore should be given a berth of a little over 1 mile to avoid the shoals off the river entrances.

From the entrance to Ipswich Harbor the shore extends 2 miles in a general southeasterly direction to the entrance of Essex River (see heading Essex River), and from thence about 2 miles to Annisquam Harbor (Squam River). Annisquam Harbor light is on the eastern side of the entrance to the harbor, and on Davis Neck, about ⅝ mile **NE. ½ E.** from the light-house, is a U. S. life-saving station.

Between Annisquam Harbor light and Halibut Point, the northern point of Cape Ann, the shore has a general **NE.** by **E.** trend and presents a bold rocky appearance, indented by several small coves. The villages of **Bay View** and **Lanesville** are situated on this stretch of the coast. To the eastward of Halibut Point and to the westward of Straitsmouth light is Sandy Bay, a large, deep, open bight which is to be made a harbor of refuge. Under the supervision of the U. S. Engineers a breakwater is being constructed extending 3,600 feet in a direction a little to the westward of N., the axis of the breakwater being on the range of Avery's Ledge spindle and Cape Ann South light (see heading "Sandy Bay and Rockport Harbor.")

Cape Ann lights on Thatcher Island bear **S. ¾ E.**, distant a little over 1½ miles from Straitsmouth light-house. Two small unimportant coves make into the eastern shore of Cape Ann between these lights. The passage between Thatcher Island and Cape Ann is about ½ mile wide, but is obstructed by shoals and only used by local craft of light draught.

MERRIMACK RIVER AND NEWBURYPORT HARBOR.‡

Merrimack River is the largest and most important river in the eastern part of Massachusetts; it is the approach by water to the cities of Newburyport and Haverhill, and the towns of Salisbury and Bradford, and is navigable for vessels of 9 feet draught at high water up to Haverhill, and 14 to 15 feet draught at high water to Newburyport. The river is seldom entered for refuge, but the towns on its banks have some trade, mostly coastwise. The entrance

† Shown on Coast and Geodetic Survey charts: **108**, scale $\frac{1}{80,000}$, price $0.50; and **6b**, scale $\frac{1}{400,000}$, price $0.50.

‡ Shown on Coast and Geodetic Survey chart: **108**, scale $\frac{1}{80,000}$, price $0.50.

(Newburyport Harbor) is obstructed by a shifting bar, with 8 feet over it, which is dangerous to cross in heavy weather; it is marked by a light-house on its southern side and two range lights on posts on its northern side, and bears **NW. by N. Northerly**, distant about 11 miles from Halibut Point, the northern point of Cape Ann, and **S SW. ¾ W.**, distant 15 miles from Whale Back light-house, at the entrance to Portsmouth Harbor. Under the supervision of the U. S. Engineers, breakwaters, with an opening 1,000 feet wide between the ends, are being built from both points at the entrance out to the bar. The channel between the entrance and the head of tide water, about 1¼ miles above Haverhill, is narrow and crooked in places; it has been improved by the removal of some rocks and by dredging. Several draw-bridges cross the river between the lower end of Newburyport and Haverhill; the width of the draws is about 40 feet.

Newburyport is a city on the south bank of the river, about 2½ miles above the entrance; it has a considerable coastwise and some foreign trade. The deepest draught that can cross the bar at high water under favorable conditions is 15 feet. The usual draught is 11 feet; there is 11 feet at low water alongside some of the wharves. The city is on the line of the Eastern Division of the Boston and Maine R. R.

Haverhill is a manufacturing city on the south bank of the river, about 15½ miles above its mouth. Vessels bound to Haverhill usually tow up the river at high water. The mean rise and fall of tides at the city is about 4 feet.

Prominent objects.—**Newburyport light** (see table page 112) is on the southern point at the entrance inside of the breakwaters. On the northern side opposite the light-house are **two range lights** on posts, which form the range for crossing the bar. About 1 mile to the northward, on Salisbury Beach, is a large hotel.

The best and usual **anchorage** in the river is in the channel just above Black Rock beacon in 15 to 16 feet water.

Pilots.—Strangers entering the river should take a pilot, and it is advisable for all vessels over 9 feet draught to take one, as the channel over the bar changes after heavy easterly gales. Vessels bound up the river above Newburyport should take a pilot or tow-boat. Pilots can be had by making signal outside the bar, standing off and on outside the whistling buoy until boarded. Pilotage is compulsory for all vessels except passenger steam vessels regulated by the laws of the United States and carrying a pilot commissioned by the United States Commissioners, all vessels regularly employed in the coasting trade, all fishing vessels other than whalers, and all vessels of less than 7 feet draught of water.

The rates for outward pilotage are: from 7 to 12 feet draught, 65 cents per foot; from 12 to 15 feet, inclusive, 85 cents per foot; upward of 15 feet, $1 05 per foot.

The rates for summer inward pilotage are: from 7 to under 12 feet draught, 95 cents per foot; from 12 to 15 feet, inclusive, $1.25 per foot; over 15 feet, $1.60 per foot.

The rates for winter inward pilotage are: from 7 to 12 feet draught, $1.25 per foot; from 12 to 15 feet, inclusive, $1.65 per foot; over 15 feet, $2.10 per foot.

Vessels not spoken until within the bar shall pay only half pilotage; if not spoken until within the Black Rocks shall pay no compulsory pilotage.

Tow-boats can be had at Newburyport; vessels bound up the river usually take one.

Supplies.—Coal in large quantities can be obtained in Newburyport alongside the wharf or in lighters. The water in the river is fresh for about 7 months in the year. Provisions and ship chandler's stores can be had in abundance.

Harbor Regulations.—The harbor master has control of the anchorage and the berthing of vessels at Newburyport.

Quarantine Regulations.—The board of health may from time to time establish the quarantine to be performed by vessels arriving within the harbor. The **Quarantine Anchorage** is at Black Rock, above which no vessel with contagious or infectious disease on board is allowed to pass without permission from the board of health.

The **Public landing** in Newburyport is at Central Wharf.

Wind Signals of the U. S. Signal Service are displayed from the custom house; they can be seen by the shipping in the harbor.

Freshets occur sometimes in the spring, but as a rule they do not interfere with navigation.

Ice seldom obstructs navigation as far up as Newburyport; drift ice may sometimes interfere with vessels under sail, but steamers and vessels assisted by tow-boats can usually work their way through. Westerly winds carry the drift ice out to sea; during their continuance the flood current has no effect upon the local formations or drift ice. With the wind from any other direction the flood current will prevent the drift ice from leaving the river.

Tides.—The mean rise and fall of tides in Newburyport Harbor is 7.9 feet. See also table on page 116 for other tidal data.

SAILING DIRECTIONS, NEWBURYPORT HARBOR.

These directions lead up to the whistling buoy off the bar. Strangers wishing to enter the river should take a pilot. The bar cannot be crossed in easterly gales, and vessels should either make Gloucester or Portsmouth harbors for an anchorage until the sea will allow them to pass the bar.

1. *Approaching from the Northward.*—When to the southward of Isles of Shoals bring the light to bear **NE.** ¾ **E.** and steer **SW.** ¾ **W.**, and keep about 1 mile off shore when Newburyport light is approached. When Newburyport light bears about **W NW.** ¾ **W.** the whistling buoy off the entrance should be on a line with it. Keep outside the whistling buoy until boarded by a pilot.

1 A. *Approaching from the Southward.*—Pass 1 mile or more to the eastward of Cape Ann lights and steer **N.** by **E.** Leave the beacon on the Dry Salvages about ⅝ mile on the port hand, and when it is in range with Straitsmouth light bearing **W SW.**, steer **NW.** ¾ **N.** When approaching Merrimack River entrance keep about 1 mile off shore and outside the whistling buoy until boarded by a pilot.

Remarks.—The sailing directions in the two preceding sections lead well clear of all dangers. It should be remembered that only light draught vessels can cross the bar at high water when there is more than an ordinary sea from the eastward.

PLUM ISLAND SOUND AND IPSWICH RIVER†

have a common entrance 7½ miles **S.** from Newburyport entrance and 5 miles **W.** by **N.** from Halibut Point, the northern point of Cape Ann. The entrance is marked by a light-house and range light on its southern side, but a shifting bar, with 5½ feet in the channel at low water, makes the services of a pilot necessary. In strong northeasterly winds the harbor is practically closed to all but small craft on account of the sea which breaks across the bar. Inside the entrance and in the channel of Plum Island Sound good anchorage can be found in 3 to 5 fathoms water.

The town of **Ipswich** on the Ipswich River, about 3 miles above the light-house, can be reached through a narrow and crooked channel which has about 2 feet at low water in several places below the town. The mean rise and fall of tides at the entrance is 8.8 feet.

Strangers desiring to enter should lie off with pilot signal set, keeping 1¼ miles from the shore until boarded by a pilot.

ESSEX RIVER.†

This is an unimportant stream flowing in a general northeast direction and emptying into the bight to the westward of the peninsula of Cape Ann. The entrance between Two Penny Loaf on the east and Castle Neck on the west is about midway between Ipswich and Annisquam Harbor lights; it has a shifting bar over which a depth of about 7 feet can be taken through a narrow buoyed channel. The river is navigable at high water for vessels of 7½ feet draught as far as the village of **Essex**, a distance of 4 miles above its mouth, but vessels of 13 feet draught have been taken over the bar to an anchorage inside the entrance. Light draught vessels sometimes enter the river for shelter from northeasterly winds, coming to anchor under the lee of Two Penny Loaf, but strangers should always take a pilot, keeping Annisquam Harbor light bearing to the southward of **SE.** by **S.** until boarded by one. Sailing vessels bound to Essex usually take a tow-boat on account of the narrow crooked channel; tow-boats may be had from Gloucester.

Sailing directions for entering the river would be apt to mislead on account of the shifting nature of the bar. The buoys mark the channel just inside the shoal part of the bar.

ANNISQUAM HARBOR AND SQUAM RIVER.†

This is the easternmost harbor in Ipswich Bay; it is of little importance, being only used by a few small vessels as a harbor of refuge and by coasters carrying coal to the village of **Annisquam**, which is on the east shore just inside the mouth of the river. Squam River flows in a northerly direction and has a narrow channel which is navigable for vessels of 8 feet draught at high water, up to the railroad bridge 3¼ miles above its mouth. The deepest draught taken to Annisquam is 12 feet and the usual draught entering about 8 feet; there is 5 feet of water alongside the wharf at the village.

The entrance of the river is obstructed by a bar, over which a buoyed channel, with a depth of 5 feet at low water, leads into the river. **Annisquam Harbor light** (see table, page 114) is on the eastern point at the entrance and the principal guide for entering. On the beach to the southeastward of the light is a life-saving station of the Massachusetts Humane Society, and a U. S. life-saving station is situated ⅜ mile **NE.** ½ **N.** from the light-house. The usual anchorage is in the channel inside of Lobster Rock beacon, but it is exposed to north and northwesterly winds. Strangers entering Annisquam Harbor usually take a pilot, standing off and on outside with signal set until boarded by one. There are no regular pilots. If a tow-boat is desired one may be obtained from Gloucester.

Tides.—The mean rise and fall of tides is 8.8 feet. See also tide table on page 116.

† See foot note ‡, page 167.

GENERAL DIRECTIONS, ANNISQUAM HARBOR.

Vessels of over 4½ feet draught should await a favorable tide. Bring Annisquam Harbor light to bear **S.** when it is about ¾ mile distant and steer for it on this bearing, passing about midway between the two spar buoys which are just outside the bar. When the light is about 350 yards distant ahead change course to **S SW.**, leave the light about 150 yards on the port hand and *Lobster Rock* beacon (square open-work granite) about 75 yards on the port hand. Leave *Babson's Point*, the point seen on the port bow, about 150 yards on the port hand, and when it bears abeam change course to **S SE. ½ E.** Take care not to be set on to the *Barn Rocks* which lie 225 yards **W.** by **N.** from Babson's Point. Anchor in the channel with the western end of Babson's Point bearing **N.**

SANDY BAY AND ROCKPORT HARBOR.†

Sandy Bay is the large bight in the northeastern shore of Cape Ann, between Straitsmouth Island on the east and Andrew's Point on the west. Between these points the bay is 2 miles wide and about 1½ miles long to its head (Rockport Harbor). Under the supervision of the U. S. Engineers improvements are in progress to make this bay a harbor of refuge. A breakwater is being built which is to extend 3,600 feet from Avery's Ledge in a direction a little to the **W.** of **N.** to Abner's Ledge, with its axis on a range with Avery's Ledge spindle and Cape Ann South light-house. In 1890 the substructure of this breakwater had been finished and had a depth ranging from 18 to 23 feet over it. It is proposed to extend the breakwater in a **NW.** by **W.** direction from Abner's Ledge 5,400 feet toward Andrew's Point, but work has not yet been commenced on this section. When completed the breakwater will protect an anchorage of 1,377 acres with depths ranging from 5¼ to 14½ fathoms. Lying to the northeastward of Straitsmouth light are several dangerous rocks and shoals, some of which are bare. On the western shore of the bay are two small coves, Pigeon Cove Harbor and the Rockport Granite Company's Harbor.

Pigeon Cove Harbor bears **NW. ¼ W.** from Straitsmouth light-house. It affords a well sheltered anchorage for a limited number of vessels of not more than 10 feet draught behind a breakwater which extends out from its northern side. A small charge is made to vessels using this as a harbor of refuge.

The **Rockport Granite Company's Harbor** bears about **W. NW.** from Straitsmouth light-house; it is protected by a breakwater and affords good shelter for a limited number of vessels of less than 12 feet draught.

Rockport Harbor is at the head of Sandy Bay and comprises the open bight at the head of the bay known as the **Outer Harbor**, and a small cove with a narrow entrance, just to the eastward, called the **Inner Harbor.** The Outer Harbor is open to northerly and easterly winds, and is sheltered only against southerly and westerly winds. The Inner Harbor is much used as a harbor of refuge, but it is small and can only accommodate a limited number of vessels of 7 to 10 feet draught; vessels of 12 feet draught can enter, but they lie aground at low water. The entrance is about 75 yards wide, and inside, the anchorage is about 300 yards long and 100 yards wide. At the head of the Inner Harbor, on its western side, is the basin, a space about 100 yards wide and 130 yards long, which is inclosed by stone piers and is almost all bare at low water.

The town of **Rockport** is situated along the shore of Rockport Harbor; it is about 3 miles from the town of Gloucester, and of no commercial importance.

Mean rise and fall of tides 8.6 feet (see also the table on page 116).

SAILING DIRECTIONS, ROCKPORT HARBOR.

These directions are good for a draught up to 10 feet and lead to the anchorage in the Inner Harbor.

1. ***Approaching and Entering.—From the Northward.***—When Straitsmouth light is made steer for it on any bearing to the eastward of **S.** and pass more than ¼ mile to the northward of Halibut and Andrew's points. When Andrew's Point bears to the northward of **W.**, steer a little more to the southward, keeping Straitsmouth light on the port bow. When the large brick chimney in Rockport bears **W SW.**, steer for it on this bearing; pass about midway between the end of the breakwater and the eastern point at entrance, leaving Breakwater Ledge buoy on the starboard hand. When inside the entrance anchor in the middle of the harbor in 11 feet of water.

Remarks.—When steering for Straitsmouth light, Halibut and Andrew's points should be on the starboard bow and be left over ¼ mile distant on the starboard hand when passing. The town of Rockport will be seen on the starboard bow at the head of Sandy Bay. Avery's Ledge spindle and buoy will be seen about ¾ mile **N NE.** from Straitsmouth light-house and the Dry Salvages about ⅞ mile farther to the eastward. The submerged breakwater is recognized by a number of range poles and wooden mooring-buoys which mark it. Standing for Rockport Harbor on the **W SW.** course the entrance should be ahead and the buoy on Harbor Rock a little on the starboard bow. When inside the harbor and desiring to enter the basin, it will be necessary to await high water. The entrance to the basin will be seen between the two piers in the southwestern end of the harbor.

† Shown on Coast and Geodetic Survey charts: **333**, scale $\frac{1}{20,000}$, price $0.20; and **108, 109**, scale of each $\frac{1}{80,000}$, price of each $0.50.

Dangers.—Ledges extend out nearly 200 yards to the northward and eastward from Halibut and Andrew's points; they show partly bare at low water. To avoid them give the points a berth of at least ¼ mile.

Flat Ground is a dangerous rocky shoal, with 2 to 14 feet water on it, nearly ½ mile long in a **N NE.** and **S SW.** direction, and a little over ⅛ mile wide at its widest part. It bears **N NE. ¼ E.** distant ¾ mile from Straitsmouth light-house, and is marked at its southern end by a buoy (spar, red, No. 2).

Abner's Ledge has a least depth of 7 fathoms over it, and lies about ⅝ mile to the westward of Flat Ground buoy (spar, red, No. 2). This ledge is at the angle of the breakwater which is in course of construction.

Avery's Ledge is a cluster of sunken rocks, with a least depth of 4 feet over them, lying nearly ⅝ mile **N NE. ¼ E.** from Straitsmouth light-house. It is marked by a buoy (spar, red, No. 2) placed off its southwestern side. The U. S. Engineers maintain a spindle on the shoalest part of the ledge as a range for the breakwater which is being constructed in a northerly direction from it.

Dodge's, Mitchell's, and **Bartlett's rocks** lie in a cluster nearly ¼ mile from the western shore of Sandy Bay, about **NW.** by **W. ½ W.** from Straitsmouth light-house and to the northeastward of the entrance to the Rockport Granite Company's Harbor. Some of these rocks are nearly bare at low water, and Dodge's Rock is marked by a spindle (iron shaft, red, cage on top). Mitchell's Rock, 4¼ feet water, lies about 230 yards **N.** by **E. ¼ E.** from the spindle. There are two spots with 12½ feet and 14 feet of water, respectively, about 275 yards **S.** by **E. ½ E.** from the spindle.

Twelve-foot Rock is comparatively small and lies 350 yards from the south shore of Sandy Bay and nearly ⅝ mile **W NW. ½ W.** from Straitsmouth light-house. It is not marked and is left on the port hand by vessels bound into Rockport Harbor.

Breakwater Ledge is awash at low water of spring tides and lies about 100 yards to the northeastward of the end of the breakwater at the western side of the entrance to the harbor. It is marked by a buoy (spar, red, No. 4) which is left on the starboard hand when entering.

1 A. ***Approaching and Entering.—From the Southeastward or Southward.***—Keep at least ¾ mile to the eastward of Cape Ann lights and steer for Straitsmouth light on any bearing between **W. ½ S.** and **NW.** by **N.**; leave the light nearly ¼ mile on the port hand, passing about 300 yards south of the spindle on Avery's Ledge. When on a line between Straitsmouth light and Avery's Ledge spindle, steer **W.** by **N.** until the tall brick chimney in Rockport bears **W SW.** Steer for the chimney on this bearing and proceed as directed in Section 1.

Remarks.—Thatcher Island should be left ¾ mile on the port hand to avoid the Londoner. When approaching Straitsmouth light, the beacon on the Dry Salvages will be seen to the northeastward of the light; to the westward of the beacon are the Little Salvages, over which the sea breaks when they are not showing bare. The sailing line leads south of Avery's Ledge, and vessels should not pass north of it on account of the substructure of the breakwater, which is shown by a line of range poles and wooden mooring buoys.

On the **W.** by **N.** course the entrance to the Rockport Granite Company's Harbor will be ahead and the town of Rockport and the entrance to the Inner Harbor will be on the port bow. As the tall brick chimney in Rockport approaches a **W SW.** bearing, the opening between Straitsmouth Island and the mainland (Gap Head) will be closed. On the **W SW.** course the entrance to the harbor will be ahead.

Dangers.—**The Londoner** is a ledge about ⅝ mile long in a **NE.** and **SW.** direction and a little over ⅛ mile wide; it has a general depth of 7 to 15 feet over it and lies ½ mile **E SE.** from Cape Ann light-houses. Near the southern part of the ledge, on a cluster of rocks which show bare at low water, is a spindle (iron shaft, with octogonal cage on top). There is a passage with 5¾ fathoms between the Londoner and Thatcher Island, which is sometimes used by coasters and fishermen.

Dry Salvages is an irregular shaped ledge nearly 500 yards long in a **N.** and **S.** direction, showing partly bare at low water; near its middle is a small bare rock on which is a tripod beacon 55 feet high and painted red. This beacon bears **E NE.**, distant a little over 1 mile from Straitsmouth light-house.

Little Salvages is a ledge showing bare at low water; it lies about ¼ mile to the westward of Dry Salvages. Shoal water extends out a little more than 200 yards from the western side of the bare part of the ledge, and off the eastern side, in the passage between Dry Salvages and Little Salvages, is a small rock, bare at low water of spring tides. This rock bears **NW.**, distant 375 yards from the beacon on the Dry Salvages.

The **Flat Ground** and **Avery's Ledge** are described under Section 1, preceding.

Ledges extend to the northeastward and eastward from Straitsmouth light a distance of 300 yards, and vessels passing the light should give it a berth of 400 yards while to the eastward and northeastward of it.

For the dangers in Sandy Bay see "Dangers" under Section 1, preceding.

GENERAL DIRECTIONS TO AN ANCHORAGE IN PIGEON COVE.

I. ***Coming from the Northward.***—Follow the directions in Section 1, "Sailing Directions, Rockport Harbor," and when inside Andrew's Point follow the western shore of the bay, giving it a berth of about 400 yards. When Straitsmouth light bears about **SE. ½ E.**, Pigeon Cove will be open, bearing **NW. ½ W.** This course should be steered until inside the points at the entrance; then follow the western shore until inside the pier, when come to anchor in about 12 feet water.

II. ***Coming from the Southward.***—Follow the directions in Section 1 A, "Sailing Directions, Rockport Harbor," and when on a line between Straitsmouth light and Avery's Ledge spindle and about 250 yards to the southward of the latter, steer **NW.** by **W.** for the entrance of Pigeon

Cove. When inside the points at the entrance follow the western shore until inside the pier and anchor in 12 feet water.

Remarks and Dangers.—Dodge's Rock spindle and the dangers surrounding it are about 500 yards to the southward of the entrance to the cove. In strong easterly winds, when coming from the northward, it is advisable to give Halibut and Andrew's points a berth of ½ mile and to keep well off the western shore of Sandy Bay until Pigeon Cove is opened. **Pigeon Rock** has 4 feet of water over it and lies a short distance to the southward of the northern point at the entrance to Pigeon Cove. It is left on the starboard hand when entering.

GENERAL DIRECTIONS TO THE ANCHORAGE IN ROCKPORT GRANITE COMPANY'S HARBOR.

I. ***Coming from the Northward.***—Follow the directions in Section 1, "Sailing Directions, Rockport Harbor," until Andrew's Point bears **W.**, distant ¼ to ½ mile; then steer **S.** ¾ **W.** and leave Dodge's Rock spindle about ¼ mile on the starboard hand. When Straitsmouth light bears **E SE.** ¼ **E.** steer **W NW.** ¼ **W.** for the entrance of the harbor; pass about 300 yards south of the spindle on Dodge's Rock, and when it bears **N.** haul a little to the northward and pass about 100 yards north of Sandy Bay Ledge. When abreast the latter stand into the harbor, leaving the end of the breakwater about 50 yards on the starboard hand. Anchor when inside the breakwater in 15 feet water.

II. ***Coming from the Southward.***—Follow the directions in Section 1 A, "Sailing Directions, Rockport Harbor," until on a line between Straitsmouth light and Avery's Ledge spindle; then steer **W.** by **N.** for the entrance of the harbor. Pass about 300 yards south of the spinndle on Dodge's Rock and about 100 yards north of Sandy Bay Ledge, and follow the directions in the preceding paragraph to the anchorage.

Remarks and Dangers.—**Dodge's Rock** and the dangers surrounding it are described under Section 1, "Sailing Directions, Rockport Harbor."

Sandy Bay Ledge is a small, rocky islet surrounded by shoal water and lies off the southern point at the entrance to the harbor; it should be left about 100 yards on the port hand when entering. Standing in past the end of the breakwater the best water leads about 50 yards from its end.

APPENDIX I.

GULF OF MAINE AND EAST COAST OF CAPE COD.

TIDAL CURRENTS AT ENTRANCE TO GULF OF MAINE.†

Observations show that the tidal currents of this locality are of sufficient strength to render their consideration in the reckoning, especially of sailing vessels, highly important. A chart of the Gulf of Maine, showing the positions of the stations at which the observations were made, and the locality of the "tide rips," will be found facing page 11 in this volume.

The simplest statement that can be made respecting these currents is the following:

GENERAL RULE.

Along the whole line between Nantucket Shoals and Cape Sable Bank the ebb current runs southwardly during the first four and a half hours after the *southing* or *northing* of the moon; and the flood current northwardly from the sixth to the eleventh hour after the *southing* or *northing* of the moon. The time of turning on George's Bank corresponds nearly with the time of high or low water at Boston and Portland; but in the channel to the westward of the bank it is later, and to the eastward earlier.

Of the two following tables, No. 1 gives the direction and rates of the tidal currents for four divisions of the belt examined between Nantucket Shoals and Cape Sable Bank; but the times given in it are subject to variations of twenty-two minutes each way, and the rates of the currents to variations up to one-fifth by reason of the tidal inequalities. If, however, the navigator has the "*Tide Tables for the Atlantic Coast,*" issued from the Coast Survey Office (and in which high water for Boston is given for every civil day of the year), Table No. 2 will be found more convenient and accurate for practical use, since no corrections of time for tidal inequalities are required. In this table (No. 2) the hours at the heads of the columns are tidal hours, or twelfths of the time between any two following high waters,—one high water being assumed to occur at O^h and the next at XII^h. The rates given are those for an ordinary tide of 9.8 feet range at Boston, and must be increased or diminished proportionally with the range of the tide.

All of the directions are *magnetic*.

† The rule and tables here given for the use of navigators have been deduced by Professor Henry Mitchell, Assistant, Coast and Geodetic Survey, from Observations made by the Coast Survey during the summer of 1877, at eight stations between Nantucket Shoals and Cape Sable, with the schooner *Drift*, Acting Master Robert Platt, U. S. N., Assistant, Coast and Geodetic Survey, commanding.

TABLE I.

Locality of Station.	Time of turning after Moon's Transit.		First Quarter.		Strength.				Third Quarter.		Remarks.
	Flood to ebb.	Ebb to Flood.	Set.	Drift.	Time after Moon's Transit.		Set.	Drift.	Set.	Drift.	
	h. m.	h. m.		Knots.	h. m.	h. m		Knots.		Knots.	
Great South Channel (between Nantucket Shoals and George's Bank).	11 55	------	S. ½ W.	0.94	2 37	------	S. by W. ½ W.	1.30	W SW.	0.94	Ebb.
	--------	5 37	N. ½ W.	1.02	------	8 43	N. ½ W.	1.41	N. by W.	0.85	Flood.
George's Shoal	11 19	------	SE.	1.60	2 1	------	S. ½ E.	1.90	S SW.	1.40	Ebb.
	--------	5 7	NW. ½ W.	1.60	------	8 13	N. by W.	1.90	NE.	1.40	Flood.
Great Eastern Chan'l (between George's Bank and Brown's Bank).	11 14	------	SE.	1.00	1 56	------	S. ½ E.	1.40	S SW.	1.20	Ebb.
	--------	5 2	NW. ½ W.	1.10	------	8 8	N NW.	1.30	N. ½ E.	1.00	Flood.
Northern Channel (between Brown's Bank and Cape Sable Bank).	10 50	------	SE.	1.25	1 32	------	SE. ¾ S.	1.27	S. by E.	1.00	Ebb.
	--------	4 38	W. by N.	1.00	------	7 44	NW. by W.	1.38	W NW.	1.00	Flood.

TABLE II.

RATE AND DIRECTION OF CURRENT FOR EACH TIDAL HOUR AFTER TIME OF HIGH WATER AT BOSTON.

Locality.	0h		1h		2h		3h	
	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.
Great South Channel	0.3	NE. by N.	0.6	SE. by E. ½ E.	1.0	S. ½ W.	1.3	S. by W. ½ W.
George's Shoal	0.8	E.	1.5	SE.	1.8	S SE.	1.9	S. by W.
Great Eastern Channel	0.6	E. by S.	0.9	SE.	1.3	S SE.	1.4	S. ½ E.
Northern Channel	0.7	E. by N.	1.2	SE.	1.3	SE. ½ S.	1.2	S SE. ½ E.
	4h		5h		6h		7h	
Great South Channel	1.2	S. by W. ½ W.	0.9	S. by W. ½ W.	0.3	SW. ½ S.	0.5	NW. by W.
George's Shoal	1.6	SW.	1.2	SW.	0.8	W. by S.	1.4	NW. by W.
Great Eastern Channel	1.3	SW.	1.0	SW.	0.3	W SW.	1.0	NW. by W.
Northern Channel	1.0	S. by E.	0.6	S.	0.3	W. by S.	0.9	W. by N.
	8h		9h		10h		11h	
Great South Channel	1.0	N. ½ W.	1.3	N. ½ W.	1.3	N. ½ W.	0.9	N. ½ W.
George's Shoal	1.7	NW. by N.	1.8	N. by E.	1.6	N NE.	1.2	NE. by E.
Great Eastern Channel	1.2	NW. ½ N.	1.3	N NW.	1.2	N. by E.	0.7	NE.
Northern Channel	1.3	NW. by W.	1.1	NW. by W.	0.9	N NW.	0.5	N. by E.

CURRENTS—CAPE ANN TO CAPE COD.†

CURRENTS ON STELLWAGEN'S BANK AND ITS VICINITY.

Over Stellwagen's Bank, and in the channel between it and Cape Cod, the current of the ebb (easterly) begins to run from half an hour to one hour *before* the time of high water at Boston. Three hours *after* that high water the *strength* of the current of ebb is reached; and then (at that time) it runs three-fourths of a mile an hour, about **E. by N.** About six hours *after* the time of high water at Boston the ebb slacks; and soon after the current turns in the opposite direction. Three hours later (between the ninth and tenth hours *after* the time of high water at Boston) the *strength* of the current of flood is reached, with a velocity of nearly three-fourths of a mile in a **W. by N.** direction.

CURRENTS ON THE EASTERN COAST OF CAPE COD.

On the outside (eastern) coast of Cape Cod the tidal currents run generally parallel with the shore. Ebb and flood are of unequal velocity and duration, usually the former predominating at high declinations of the moon and the latter at or near zero declination.

† The rules and tables given under this heading are from the reports of Professor Henry Mitchell, Assistant, Coast and Geodetic Survey, and are based on reductions by Mr. Henry L. Marindin, Assistant, Coast and Geodetic Survey, and himself, of the careful observations made by Master Robert Platt, U. S. Navy, and Lieutenant J. E. Pillsbury, U. S. Navy.

The *strength* of the ebb current (running southward) is reached at the *southing of the moon*; that of the flood current (running northward) about six hours *later*.

Off Chatham lights *two knots* per hour, and off Highland light *one knot* may be expected at *strength*.

TABLE III.

RATE AND DIRECTION OF CURRENT FOR EACH TIDAL HOUR AFTER TIME OF HIGH WATER AT BOSTON.

Locality.	O^h		I^h		II^h		III^h	
	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.	Rate, Knots.	Direction.
In the Channel between Race Point and Stellwagen's Bank	0.4	E NE.	0.7	E. ½ N.	0.8	E. by N.	0.8	E. by N.
On Stellwagen's Bank	0.6	E NE.	0.7	E NE. ½ E.	0.7	E NE. ½ E.	0.8	E. by N.
Ten miles to the southward of Cape Ann	0.2	W NW.	0.3	N NW.	0.2	N NW.	0.2	N NE.
† Six miles to the southward of Cape Ann	0.3	S SE. ½ E.	0.3	SE. by E. ½ E.	0.4	SE. by E. ½ E.	0.3	SE. ½ E.
	IV^h		V^h		VI^h		VII^h	
In the Channel between Race Point and Stellwagen's Bank	0.7	E NE. ½ E.	0.5	N NE. ½ E.	0.2	E. by N.	0.4	SW. by W. ½ W.
On Stellwagen's Bank	0.7	E.	0.3	E. by S.	0.2	SE.	0.5	W SW.
Ten miles to the southward of Cape Ann	0.3	N NE.	0.4	N NE. ½ E.	0.2	N NE. ½ E.	0.2	E SE.
† Six miles to the southward of Cape Ann	0.2	SE. ½ E.	0.2	SE. by E.	0.2	S SW.	0.2	SW. by S.
	VIII^h		IX^h		X^h		XI^h	
In the Channel between Race Point and Stellwagen's Bank	0.5	SW. by W. ½ W.	0.7	W. ½ N.	0.6	W.	0.3	E SE.
On Stellwagen's Bank	0.6	W. ½ S.	0.6	W NW. ½ W.	0.6	NW. by N.	0.6	N. ½ E.
Ten miles to the southward of Cape Ann	0.4	W. SW.	0.5	W SW.	0.6	W.	0.4	W NW.
† Six miles to the southward of Cape Ann	0.2	SW. ½ W.	0.2	W. by S.	0.2	SW. by W.	0.2	S. ½ W.

† The observations at this station are doubtful, owing to the prevalence of heavy gales at the time they were made.

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APPENDIX II.

PILOTS AND PILOTAGE, HARBOR CONTROL, QUARANTINE, ETC.

MAINE.

Extracts from the Revised Statutes of Maine, 1887.

TITLE III. CHAPTER 36.

PILOTS.

Sec. 1. The governor, with the advice and consent of council, may appoint pilots for any port, * * * * *; and such pilots shall, before entering upon said duties, be sworn, and give bond to the treasurer of State in the sum of five thousand dollars for the faithful performance thereof. Appointment oath and bond of pilots.

Sec. 2. Such pilots shall take charge of all vessels, drawing nine feet of water and upwards, bound into, and of all such vessels, except coasting and fishing vessels, bound to sea out of said ports, and shall pilot them into or out of the port assigned them, first showing the master thereof their branch and informing him of their fees; but any master may pilot his own vessel without being subject to pay therefor. Their duty. Master may pilot his own vessel.

Sec. 4. If any vessel while under the charge of such pilot, is lost, run aground, or cast away, through his fault, he is liable to pay the owner or insurer a just compensation for any damage thereby sustained. Liability for damage caused by their fault.

TITLE I. CHAPTER 3.

HARBOR MASTERS AND PORT WARDENS.

Sec. 64. Selectmen of towns may annually appoint a harbor master, who shall be subject to all the duties and liabilities of said officer in cities, * * * * *. Where two or more towns or cities, or a town and city, are situated on the same general harbor, the larger town or city has the appointing power as above. Selectmen may appoint harbor masters. Where one harbor includes two or more towns.

TITLE III. CHAPTER 36.

Sec. 23. Port wardens shall be elected in any city or town situated on navigable waters, upon the petition of ten or more citizens engaged in commerical pursuits therein. Port wardens, election of.

Sec. 28. When requested by any person interested, port wardens shall proceed on board of any vessel on her arrival in port and survey her hatches * * *. They shall also examine the condition and stowage of the cargo of any vessel, * * * they shall examine goods, wares, or merchandise of any description, in any warehouse or store, or on any wharf or at any place where the same are; provided, that said goods, wares, or merchandise are part of the cargo, and are claimed to be damaged; * * * * *. Duty of port wardens on arrival of vessels.

Sec. 29. When requested in writing by any person interested, port wardens shall also survey the cargo of vessels arriving in port in distress; * * * * *. Duty of port warden in case of vessels arriving in distress.

Sec. 30. When requested in writing by any person interested, they shall also survey any vessel which may have suffered wreck or damage, or which may be deemed unseaworthy; * * * *. In case of wrecked or damaged vessels.

TITLE II. CHAPTER 14.

QUARANTINE.

Masters, seamen, or passengers of vessels may be examined on oath in reference to infectious distempers.

Sec. 17. If a master, seaman, or passenger of a vessel, in which there is, has lately been, or is suspected to have been, any infection, or which has come from a port where any infectious distemper prevails, dangerous to the public health, refuses to answer, on oath, such questions as are asked him relating to such infection or distemper, by the local board of health of the town to which such vessel comes, which oath either of said officers may administer, he shall forfeit not exceeding two hundred dollars or be imprisoned not more than six months.

Vessels with infected persons shall anchor at a distance from towns.

Sec. 18. When a vessel arrives at a port having on board any person infected with a malignant disease the master, commander, or pilot shall anchor it at some convenient place below the town of such port at a distance safe for the inhabitants thereof and the persons on board other vessels in said port; and no person or thing on board shall be brought on shore until the local board of health give their written permit.

Penalty for violation of this provision.

Sec. 19. For the willful violation of the preceding section such master or commander forfeits not exceeding two hundred and the pilot not exceeding fifty dollars for each offence.

Selectmen may establish quarantine regulations.

Sec. 20. The local board of health of a seaport town may cause vessels arriving there to perform quarantine at such place and under such regulations as they judge expedient, when they think that the safety of the inhabitants require it; and whoever neglects or refuses to obey such orders and regulations shall forfeit not exceeding five hundred dollars or be imprisoned not exceeding six months.

Selectmen to furnish signals.

Sec. 23. The local board of health of every seaport town requiring vessels to perform quarantine shall provide, at the expense of such town, a suitable number of red flags at least three yards in length; and the master of every vessel ordered to perform quarantine shall, during the term thereof, cause one of them to be continually kept at the head of the mainmast of his vessel; and no person shall board such vessel during said term unless by permission of said officers; if he does he shall be thereafter held liable to the same regulations and restrictions as those belonging to said vessel; and shall there be detained by force, if necessary, until discharged by said officers.

Restrictions on persons visiting vessels at quarantine.

Expenses, how paid.

Sec. 25. Expenses incurred on account of any person, vessel, or goods, under quarantine regulations, shall be paid by him, or the owner of the vessel, or goods, as the case may be.

REGULATIONS FOR THE PORT OF BANGOR.

Extract from an Act Additional to an Act to Incorporate the City of Bangor.

Be it enacted by the Senate and House of Representatives in Legislature assembled.

Sec. 1. The city council of the City of Bangor are hereby authorized and empowered to make and ordain, from time to time, such by-laws, not repugnant to the constitution and laws of the State, as they may deem necessary or expedient for the location and regulation of vessels, boats, scows, and rafts, in the harbor of said city, embracing the Penobscot River from the north line of Hampden to the Bangor bridge, and the Kenduskeag Stream, from its mouth to the Kenduskeag bridge, and to affix penalties for the breach of such by-laws, not exceeding twenty dollars for any offence, to be recovered upon complaint by the harbor master, hereinafter named, before the police court of said city. Approved April 17, 1852.

The harbor master shall, as soon as practicable after the arrival of any vessel or steamer in port, board her for the purpose of exhibiting to the master the regulations of the port, and directing the vessel where to lay, if necessary.

The harbor master shall be entitled to demand and receive a reasonable compensation for any service performed by him, at the request of any person, in carrying into effect any of the provisions of this ordinance; such compensation shall be paid to said harbor master in advance by the person requesting such service, and shall in no case exceed one dollar.

No vessel, steamboat, or raft shall be allowed to anchor or lay in the main channel of the river, between the Bangor bridge and the north line of Hampden, so as to obstruct the free passage of vessels, boats, or rafts up and down the river.

No vessel, boat, or raft shall be allowed to anchor or lay between the mouth of Kenduskeag Stream and the Kenduskeag bridge in such a manner as to obstruct the free passage of vessels, boats, or rafts up and down said stream.

No vessel, boat, or raft shall anchor or lay in the usual track of the ferry-boats between Bangor and Brewer, nor in such manner as to obstruct the free passage of steamboats by their usual track to and from their usual wharves.

If any owner or owners, or master of any vessel, or any other person, shall cast or throw, or cause or suffer to be cast or thrown from their vessels, or from any other place, any stone, sand, or any other ballast, or any other thing, in the channel of said river or stream, whereby the navigation of the same may be injured, he or they shall forfeit and pay for each offence a sum not less than five nor more than twenty dollars.

If any person or persons shall cast or throw, or cause or suffer to be cast or thrown, from any wharf or dock in said port of Bangor, into the water of said river or stream, any stone, sand, cinders, or anything which may decrease the depth of water at said wharf or dock, he or they shall forfeit and pay for each offence a sum not less than five nor more than twenty dollars.

Vessels shall not lie more than one tier deep from City Point to the Bangor bridge.

The harbor master is hereby authorized, and it shall be his duty to remove, or cause to be removed any vessel or boat from any wharf in said port, at the request or direction of the owner of said wharf; and if any vessel, boat, or raft shall anchor or lie contrary to any of the regulations in any of the preceding sections, said harbor master shall forthwith give notice to the owner or master thereof, or the persons having care of the same, to remove the same, and if said notice be not complied with without delay, the harbor master shall make or cause said removal at the expense of the vessel, boat, or raft.

The master, owner, or owners of any vessel, boat, or raft, or any other person who shall violate any of the provisions of this ordinance, shall for each offence forfeit and pay a sum not less than five dollars nor more than twenty dollars; and it shall be the duty of the harbor master, immediately upon the violation of any of said provisions, to cause the person or persons offending to be prosecuted for the penalty or penalties thereby incurred.

REGULATIONS FOR THE HARBOR AND PORT OF ROCKLAND, 1887.

An ordinance.

Be it ordained by the city council of Rockland, as follows:

Sec. 1. No vessel of any kind shall be allowed to anchor and re nain in the following described channels or track of steamboats approaching or leaving their place of landing, after having been notified by the harbor master to leave the same.

A channel commencing 300 feet south of Red Buoy and running westerly to a buoy in line w th a cupola on Berry's stable shall constitute south side of one channel, and a line from Red Buoy to a point designated by a buoy southeast from Tillson's wharf to constitute north line of south channel, and then a line drawn from Black Buoy to a buoy east by north from the northeast corner of Tillson's wharf to constitute south line of north channel, and a line drawn from a point 300 feet north from Black Buoy to north end of wharf at Crockett's Point to constitute north line of the north channel, and a space shall be kept clear 900 feet east from Tillson's wharf, to extend from the western buoy of south line of the north channel to western buoy of north line of south channel. Said space and channel to be reserved for the use of steamboats entering and leaving the harbor.

The harbor master may board any vessel arriving in port for the purpose of exhibiting to the master thereof the ordinance and regulations of the port and direct the vessels where to lay, if he deem it necessary.

Sec. 2. If the owner, owners, or master of any vessel, or any other person, shall cast or throw, or cause to be thrown from their vessels or from any other place, any stone, sand, coal, lime, or other thing, at or near any of the wharves, whereby the depth of water is decreased, or the navigation to and from the same obstructed or injured, he or they shall forfeit and pay for each offence a sum not less than one or more than five dollars.

Sec. 3. A harbor master shall annually be elected by the city council. * * * * * Said harbor master is hereby authorized, and it shall be his duty, to remove, or cause to be removed, any vessel, boat, or raft from any wharf in said port of Rockland, at the request or direction of the owner of said wharf; and if any vessel, boat, or raft shall anchor or lie contrary to any of the regulations in any of the preceding sections, said harbor master shall forthwith give notice to the owner or master thereof, or the person having the care of same, to remove the same, and if said notice be not complied with, without delay, the harbor master shall make or cause said removal at the expense of the owner or owners of such vessel, boat, or raft.

Sec. 4. The master, owner, or owners of any vessel, boat, or raft, or any other person who shall violate any of the provisions of this ordinance, shall for each offence forfeit and pay a sum not less than one nor more than five dollars; and it shall be the duty of the harbor master immediately upon violation of any of said provisions to cause the person or persons offending to be prosecuted for such violations. The harbor master shall be entitled to demand and receive a reasonable compensation for any service performed by him at the request of any person, in carrying into effect any of the provisions of this ordinance; such compensation shall be paid in advance to said harbor master by the person requesting such service, and shall in no case exceed one dollar.

REGULATIONS FOR THE PORT OF BATH.

An act to authorize the city of Bath to appoint a harbor master for the port of Bath, and establish regulations for the anchoring of vessels in said port.

City may make ordinances for regulations of vessels in port.

Sec. 1. The city council of the city of Bath are hereby authorized to make such by-laws or ordinances as they may deem expedient, for the location and regulation of vessels in the port of Bath, and to impose penalties for breach of same, not exceeding ten dollars for one offense; * * * * *.

May appoint harbor master.

Sec. 2. The municipal authorities of the city of Bath may appoint a harbor master for the port of Bath, * * * whose duty it shall be to enforce the observance of the by-laws or ordinances aforesaid, and to exercise such powers as may be conferred upon him by the ordinances of the city.

(Approved February 6, 1877.)

CHAPTER XXV.

An ordinance relating to the harbor and harbor master.

Harbor master, his appointment, qualification, and tenure of office.

Sec. 1. There shall be appointed annually by the municipal authorities, * * * an able and discreet person, to be styled the harbor master, * * * * *.

Depositing ballast, etc., in harbor prohibited.

Penalty.

Sec. 3. No person shall throw or deposit, or cause to be thrown or deposited, in said harbor any ballast, stones, gravel, cinders, ashes, dirt, mud, or other substances which may in any way tend to injure the navigation thereof. Any person violating the provisions of this section shall for each offence forfeit and pay a sum not less than five nor more than ten dollars.

Regulations for vessels in harbor.

Sec. 4. The following rules and regulations are hereby adopted for the management of vessels in said harbor:

Free passage of ferry-boats and steamboats not to be obstructed.

1st. No vessel, boat, or raft shall anchor or lie in the usual track of any ferry-boat, or in such manner as to obstruct the free passage of steamboats by their usual track, to or from their respective landing places; nor shall any tugboat or other steamer leave any vessel, boat, or raft in such position as may obstruct any steamer as aforesaid.

Vessels not to lie at wharf so as to obstruct passage of other vessels.

2d. No vessel shall lie at any wharf or berth in such manner as to obstruct the free passage of other vessels coming in or going out, or being hauled from one wharf to another.

3d. All vessels at anchor in the harbor shall keep a clear and distinct light suspended at least six feet above the deck from sunset to sunrise.

Duty of harbor master to cause removal of vessels on request.

Manner of proceeding.

Removal at expense of owner.

Penalty for neglect to pay expense on demand.

4th. It shall be the duty of the harbor master to cause the removal of any vessel, boat, or raft from any wharf in said harbor at the request of the owner of said wharf or his agent. The harbor master shall at once notify the master or owner or person in charge of any vessel, boat, or raft anchored or lying contrary to any of the rules or regulations of this chapter to remove the same forthwith; and if such notice is not complied with said harbor master shall immediately cause said vessel, boat, or raft to be moved at the expense of the owner thereof. Upon neglect or refusal of the owner or master thereof to pay the expense of such removal, including two dollars and fifty cents for the harbor master's fee, on demand of the harbor master therefor, said owner or master shall be liable to a penalty for such neglect or refusal of not exceeding ten dollars in addition to such expense.

Penalty for violations of this ordinance.

Sec. 5. Any person violating, or the master or owner of any vessel, boat, or raft by which are violated, any of the provisions of this ordinance, shall for each offence forfeit and pay a sum of not less than five nor more than ten dollars; and it shall be the duty of the harbor master immediately upon such violation, to cause the person or persons liable, to be prosecuted for the penalties thereby incurred.

REGULATIONS FOR KENNEBEC RIVER AT THE CITY OF GARDINER.

Extracts from city ordinances, providing for the regulation of the harbor in the city of Gardiner.

CHAPTER II.

One or more harbor masters to be chosen.

Jurisdiction.

Sec. 1. There shall be elected annually by the city council in convention, one or more harbor masters, who shall have full power to regulate the laying of vessels * * * in the harbor within the limits of the city, * * and if any owners or commanders of any vessels, boats, scows, or rafts, or any other persons, shall violate or neglect, or refuse to obey or to comply with any known order or direction of said harbor masters, or either of them, he or they shall forfeit and pay for the use of the city, a fine of not less than two, nor more than twenty dollars for each offence.

Sec. 2. If any commander or owner of any vessel, boat, scow, or raft, shall anchor or make fast the same in said Kennebec River, in any place between the points named in the first section of this ordinance, so as to impede or obstruct the passage of vessels, boats, and rafts of timber or lumber up and down the said river, or so as to obstruct the passage of boats, or rafts of timber or lumber to and from the locks opening into the Cobbossee Contee stream, or so as to impede, obstruct, or in any way hinder the passing and repassing of any ferry-boat, or the place where any ferry is established by law between the town of Pittston and the city, and shall neglect or refuse to remove the same after notice from either of the harbor masters so to do, and within thirty minutes after receiving such notice, he shall forfeit and pay a fine of not less than two nor more than twenty dollars, for the use of the city.

Craft impeding or obstructing navigation to be removed, how.

Sec. 3. No owner or commander of any vessel, or any other person, shall throw or cause to be thrown from their vessel or otherwise any stone, sand, or other ballast, or any other thing into the channel of said Kennebec River, whereby the navigation of the same may be injured; and whosoever shall be convicted of such offences, shall forfeit and pay, to the use of the city, a fine of ten dollars.

Foreign substances liable to injure navigation not to be thrown into channel of Kennebec River.

Sec. 4. It shall be the duty of the harbor masters, or either of them, immediately upon the violation of any of the provisions of this ordinance, to cause the person or persons offending to be prosecuted for the penalties incurred by such violation.

Prosecutions.

PORTLAND HARBOR.

Extracts from ordinance on harbor.

HARBOR CONTROL.

Sec. 2. It shall be the duty of the harbor master to take charge and see to the preservation of the harbor, within the limits of the city of Portland, and extending to low water mark on the shore of Cape Elizabeth, and to enforce all such rules and regulations as may be ordained or ordered by the city council or mayor and aldermen from time to time, with reference thereto, and to collect all penalties that may be incurred by a violation of the same.

Sec. 3. No person shall throw or deposit, or cause to be thrown or deposited, in said harbor, any stones, gravel, cinders, ashes, dirt, mud, or other substance which may in any respect tend to injure the navigation thereof. And any person violating the foregoing provisions of this section, shall for each offence be liable to a penalty of fifty dollars.

Sec. 4. If any of the rules and regulations thus established shall be violated, the master or owner of the vessel, by means of which said violation shall occur, shall for each offence be subject to a penalty of twenty dollars.

Sec. 5. If any vessel shall be anchored contrary to any of the rules and regulations provided for in the preceding section, the harbor master shall forthwith give notice to the master or owner thereof, to remove said vessel at once; and if the same is not done without delay, or in case there is not a sufficient crew on board for that purpose, the harbor master shall cause such vessel to be removed at the expense of the owner or master thereof. And if the master or owner shall neglect or refuse to pay said expense on demand being made therefor by the harbor master, he shall be liable to a penalty of double the amount of such expense, in addition to the penalty provided in the preceding section.

Extracts from ordinance on gunpowder.

Sec. 4. No person shall haul into or lay at any wharf, bridge, or other landing place in this city, or bring within two hundred yards thereof, any boat or vessel having on board any quantity of gunpowder exceeding twenty-five pounds, or land from or receive on board any boat or vessel, at any such wharf, bridge, or landing place, any gunpowder exceeding the amount aforesaid without obtaining a permit from the mayor, and no boat or vessel with gunpowder on board, in quantity exceeding twenty-five pounds, shall remain at any wharf, bridge, or other landing place in the city more than six hours; nor shall any such boat or vessel be allowed to ground at any such place, or remain there after sunset.

Sec. 5. The mayor, or, in his absence, the chief engineer of the fire department, may grant permits to land gunpowder or other explosives for immediate shipment or transportation from any wharf in the city, provided that the consent in writing of the owner, agent, or wharfinger of such wharf shall first be delivered to the mayor or city clerk.

Sec. 7. All boats or vessels while lying at or within two hundred yards of any wharf, bridge, or any other vessel, shall, so long as there is gunpowder exceeding four casks of twenty-fire pounds each on board, display at the stern or bow a red flag, and in all cases casks or packages containing gunpowder shall be covered with canvas or other suitable covering.

Sec. 11. Every person violating any of these rules and regulations will be liable to a fine of not less than twenty nor more than one hundred dollars, as provided in Revised Statutes, chapter twenty-six

Rules and regulations adopted by the Board of Mayor and Aldermen, November 18, A. D. 1884.

I. All of Portland Harbor west of what is called "Hog Island Roads," shall be denominated the upper harbor, and all vessels in said upper harbor shall be anchored according to the following rules under the direction of the harbor master:

II. All vessels entering the upper harbor, not intending to be conveyed to some wharf immediately, shall be anchored on the southerly side of a line ranging with the black buoy off the breakwater, and a white buoy on a westerly course, thence on a line ranging with said white buoy and the southeasterly end of the draw of Portland bridge. No vessel to be anchored above the end of Union wharf.

III. Outward bound vessels shall be anchored north of a line ranging from the easterly corner of the English steamer's coal wharf, so-called, and the southerly corner of Fort Gorges, said line being marked by white buoys.

IV. Vessels anchoring in "Hog Island Roads" shall anchor on the easterly side of a line ranging with the southerly side of Fort Gorges and the "Bay View House" on Peak's Island, or on the southerly side of a line ranging with the observatory in Greenwood Garden, on Peak's Island, and the easterly end of House Island.

V. Vessels may be anchored south of a line ranging with the black buoy off SpringPoint Ledge and the black buoy off the breakwater.

VI. No vessel shall be anchored in the channel of the harbor so as to obstruct the free passage of the regular lines of steamers running to and from this port, the island steamers, the ferry-boat, or the entrance to the Marine Railway and Dry Dock.

VII. All vessels at anchor in the harbor shall keep a clear and distinct white light suspended at least ten feet above the deck during the night.

VIII. Vessels ordered to quarantine shall be anchored on the northeasterly side of a line ranging with the United States Marine Hospital and Fort Gorges, which anchorage shall be designated as the "Quarantine Anchorage."

IX. All steamers passing up and down the harbor, near the ends of the wharves, shall run at a low rate of speed.

X. All vessels lying across the end of any wharf, shall rig in their jib booms, or lay so that they shall not project over to obstruct the free passage of vessels to or from either side of the wharf.

XI. Vessels lying at the side of wharves, so as to obstruct the passage to adjoining wharves, must move when necessary to accommodate other vessels entering or leaving the docks.

XII. Light vessels lying alongside of a wharf, and not taking in or discharging cargo, must make way for and permit other vessels that want to load or unload cargo to come inside next to the wharf.

XIII. When fasts of vessels extend across a dock so as to obstruct passing vessels, the captain or person in charge shall cause the fasts to be slackened or cast off.

XIV. If any vessel occupying a berth at any wharf, either with or without the consent of the wharfinger thereof, shall fail to vacate such berth upon notice from such wharfinger or his agent, to the master or those having such vessel in charge for the time being, in a reasonable time, to be adjudged by the harbor master, the harbor master shall then cause such vessel to be moved to some other berth, or anchored in the stream, the expense thereof to be paid by the owners of said vessel.

XV. All square-rigged vessels shall cockbill their lower yards, brace their topsail and topgallant yards fore and aft, and rig in their jib booms, when directed by the harbor master to do so.

Extracts from ordinance on health.

Sec. 25. The harbor master and city physician shall perform such duties relative to quarantining vessels as may be required by the local board of health, and shall receive therefor such fee and expenses from each vessel visited, liable to be quarantined, as may be fixed by the said board.

NEW HAMPSHIRE.

Extracts from general laws of New Hampshire, 1878.

CHAPTER 114.

PILOTAGE.

Commissioners of pilotage appointed.

Sec. 1. The governor and council may appoint three suitable persons to be commissioners of pilotage of the harbor and river of Piscataqua, who shall hold their office during the pleasure of the governor and council.

To make regulations.

Sec. 2. Said commissioners may make such ordinances, rules, and regulations touching pilots and pilotage * * *.

To appoint pilots.

Sec. 3. They may prescribe the qualification of pilots, and from time to time appoint, under their hands and seals, so many pilots as they may judge necessary, and remove the same at pleasure, * * *.

Sec. 4. The governor and council may * * * fix the fees of pilotage * * * and a table of such fees shall be inserted upon the commission to each of said pilots, * * *. Fees of pilotage.

Sec. 5. Any pilot appointed by said commissioners, who has given bond for the faithful discharge of his duties, may take charge of any vessel, except coasting and fishing vessels of the United States of one hundred and fifty registered or enrolled tons and under, and except as provided in Section 6, and shall pilot any such vessel into or out of the river and harbor of Piscataqua, first showing to the master thereof his appointment, if requested. Rights and duties of pilots.

Sec. 6. This section is amended by Chapter 39, of the laws of the State of New Hampshire, passed June session, 1887. See below. Masters may pilot their own vessels.

HARBOR CONTROL.

Sec. 7. If any person shall unlade, cast, or throw out of any ship, vessel, or boat, or from the shore, or any wharf, any ballast, rubbish, gravel, earth, stones, dirt, ashes, or filth into the harbor or river of the Piscataqua between the light-house at the entrance of said harbor and the Boiling Rock, so called, up said river, or aid and assist therein, he shall forfeit a sum not more than ten dollars, for the use of any person who will sue for the same. Ballast, etc., not to be thrown into the harbor.

HARBOR MASTERS.

Sec. 8. The city of Portsmouth shall annually choose a harbor master, whose duty it shall be to oversee said harbor and river, and to inquire into and prosecute all offences under the preceding section. Harbor master to be chosen.

Sec. 9. The harbor master of the city of Portsmouth when called upon to decide any question or any controversy arising between the officers of the different vessels which may be lying at anchor in the harbor or at the wharves of the city of Portsmouth, shall be entitled to a fee of not less than one dollar for his services, and the same shall be paid him by the officer of the vessel against whom he may decide. His fees.

Passed June Session, 1887.

CHAPTER 39.

An act in amendment of chapter 114 of the General Laws, relating to pilots and harbor master.

Sec. 1. Any master or owner may pilot his own vessel into and out of the Piscataqua River and harbor; but if any pilot shall speak and offer service to any vessel, excepting registered or enrolled vessels of the United States bound into said river or harbor, south of a line drawn east and west from Whale's Back light-house, or shall offer service to any vessel bound out of said river and harbor, excepting registered or enrolled vessels of the United States, before they leave the wharf, he shall be entitled to one-half of the fees specified in his warrant in case the master or owner declines to employ him, and on refusal of payment, may sue for and recover the same. Pilots' rights.

Extracts from General Laws of New Hampshire, 1878.

CHAPTER 113.

QUARANTINE.

Sec. 1. The health officers may from time to time make regulations respecting quarantine * * * * *. Quarantine regulations, how made.

Sec. 2. The health officers shall require all such vessels having on board any person infected with * * * * malignant, infectious, or contagious disease, or who shall have been so infected during the voyage, or having on board any goods reasonably supposed to have any infection of such disease, to perform quarantine at such place as they shall appoint * * * * * *. Vessels to perform quarantine.

Sec. 3. The health officers may seize any goods landed from such vessel without their permission, and remove and keep the same until they shall have caused the same to be thoroughly cleansed. The expenses of such purification of the vessel and her cargo shall be paid by the master, owner, or consignee of the vessel, and they shall be severally answerable therefor. Goods landed without leave may be seized.

Sec. 4. Any owner, master, super-cargo, officer, seaman, consignee, or other person who shall refuse to obey the orders and regulations of the health officers in regard to such quarantine, or the purification and cleansing of such vessel and cargo, shall be fined not exceeding five hundred dollars, or be imprisoned not exceeding three months, or both. Refusal to obey health regulations; penalty.

Landing without leave; penalty.

Sec. 6. If any person shall come on shore from any vessel infected or justly suspected to be so, or subject to or ordered for quarantine, or performing it, or shall leave the place appointed for the sick or for purification, being employed or placed there by the health officers, without their permission, he shall be punished by a fine of one hundred dollars, or by imprisonment for three months.

Signal of quarantine.

Sec. 8. A red flag at least six feet in length shall be hoisted from sunrise to sunset at the head of the mainmast of any vessel ordered for quarantine, until such vessel shall be entirely cleansed * * * *.

Bringing vessel to wharf; penalty.

Sec. 9. If any * * * * person knowing such vessel to be subject to quarantine, shall bring the same or suffer the same to be brought to or near any wharf, or near any dwelling house or store, or shall make any false declaration as to the port or place from which he came, or shall cause, or aid, or permit the landing of any person or property of any kind from such vessel without permission of the health officers, he shall be fined not exceeding five hundred dollars, or be imprisoned not exceeding three months, or both.

Vessels may be removed.

Sec. 10. If any such vessel shall not be removed to the place of quarantine agreeably to the directions of the health officers, * * * * the health officers shall cause such vessel to be forthwith removed to such place, * * * and the expense of such removal shall be paid by the master, owner, or consignee, who shall be severally liable therefor, to be recovered by the health officers in the name of the town, with double costs.

All persons to give notice of disease.

Sec. 11. The master and officers of every vessel arriving at any port in this State having on board any person infected with * * * or any malignant, infectious, or pestilential disease, or who has been so infected during the voyage, or having on board any goods which may be reasonably supposed to have any infection of such disease, shall forthwith give notice thereof to the health officers or selectmen; and if any such master or officer shall neglect to give such information, he shall be fined not exceeding five hundred dollars, or be imprisoned not exceeding three months, or both.

CITY OF PORTSMOUTH.

Extracts from the compiled ordinances of the city of Portsmouth, 1886.

CHAPTER 27.

HARBOR CONTROL.

Sec. 1. The master, commander, or owners of every vessel shall, as soon as practicable after having hauled to the end of any wharf, cause his lower yards to be cockbilled, and her jib boom to be rigged in, so that the said jib boom may not annoy any other vessel or vessels going in or out of the adjoining docks; and the lower yards and jib boom shall be kept so arranged while such vessel lies at the end of the wharf as aforesaid, and until she is preparing immediately to leave her berth; and for every offence against any of the provisions of this section the master, commander, or owners, or either of them, of any such vessel, shall be subject to a penalty not exceeding ten dollars.

Sec. 2. No warp or line shall be passed across the mouth of any dock for any purpose, if the owners or occupants thereof object, unless the harbor master shall have decided it to be necessary; and for every offence against this provision, the master, commander, or owners of such vessel shall be subject to a penalty not exceeding five dollars.

Sec. 3. The harbor master shall have authority to regulate the mooring of all vessels in the harbor of Portsmouth, and when necessary to order the removal of such vessels, and to cause the same to be removed in obedience to such order at the expense of the master or owners thereof; and if any person shall obstruct said harbor master in the performance of any of his duties as prescribed by this ordinance, or shall neglect or refuse to obey any lawful order made by said harbor master, he shall be liable to a penalty not exceeding twenty dollars for each offence.

Sec. 4. No person shall throw or deposit in any part of the harbor of Portsmouth any stones, gravel, ballast, cinders, ashes, dirt, mud, or other substance which may in any respect tend to injure the navigation thereof; and whoever shall offend against the provisions of this section shall be subject to a penalty not exceeding ten dollars nor less then five dollars. And whenever any person on board of any vessel shall violate the provisions of this section, the master or owners of said vessel shall be liable to the penalty herein prescribed, as well as the person so offending.

Sec. 5. All the several penalties mentioned in this ordinance may be recovered by complaint before the police court of this city, to the use of any person who may make such complaint.

CHAPTER 11.

QUARANTINE.

Sec. 1. For the preservation of the public health, and to prevent the introduction of contagious and malignant diseases into this city, there shall be a regular system of quarantine established, and all vessels liable thereto, as designated in the succeeding sections, shall perform said quarantine in that part of the harbor of Piscataqua lying within a line drawn from Fort Constitution to the northwardmost of the Fishing Islands and a line drawn due west from Wood Island; and all such vessels on entering the harbor shall be brought to anchor on said grounds, and there wait the orders of the health officers.

Sec. 2. A quarantine shall be performed by all vessels, officers, crews, passengers, and cargoes which shall arrive within the harbor of the river Piscataqua and port of Portsmouth, on and after the thirty-first day of May, and until the first day of November, in each year, from any port or place between the latitude of Georgetown in South Carolina and the tropic of Capricorn; or from any other port or place where the malignant cholera, malignant fever, or other malignant or contagious diseases shall prevail, and by all vessels on board of which any sickness may have prevailed during their homeward passages. But no quarantine will be exacted of vessels coming from beyond the Cape of Good Hope or of vessels from the Cape de Verd Islands laden wholly with salt, unless contagious diseases were known to have prevailed at those places at the time of their departure, or unless such vessels have had sickness on board during their voyage home.

Sec. 3. The board of health shall from time to time appoint a suitable person whose duty it shall be to board any vessel liable to perform quarantine, and to deliver to the master thereof a copy of the ordinances of this city relating to quarantine * * * * * for which service or permit he shall be entitled to receive three dollars from the master of such vessel.

Sec. 4. All vessels having on board any person infected with small pox, plague, pestilential or malignant fever, or other malignant, infectious or contagious disease, or who shall have been so infected during the voyage, or have on board any goods reasonably supposed to have any infection of such disease, shall perform quarantine at the place named in the first section of this chapter; and the master of any such vessel shall proceed with and anchor her at such place, there to be purified and cleansed, as the health officers may direct; and a suitable place on shore shall be prescribed and properly limited by the health officers for the purification of the cargo of such vessel.

Sec. 8. A red flag of at least six feet in length shall be hoisted and displayed, day and night, at the head of the mainmast of any vessel ordered for quarantine, until such vessel shall be entirely cleansed * * * * *.

Sec. 9. All pilots of the harbor of Piscataqua shall be duly notified of these regulations by the health officers, and said pilots shall make known these regulations to the masters of all vessels they shall board or to whom they shall have opportunity to communicate the same * * * * *.

Sec. 11. All fines and forfeitures for the violation of these regulations shall, on complaint of the health officers, be recovered by prosecution against the offenders * * *.

Sec. 12. The physician of the board of health shall be entitled to receive five dollars for each visit necessarily made to any vessel at quarantine needing to be cleansed, or on board of which shall be any person sick with any malignant, infectious, or contagious disease, and each of the other members of the board shall be entitled to receive three dollars for each such visit, to be paid by the master of such vessel; but no member shall receive pay for more than one visit on any one day.

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APPENDIX III.

WIND AND WEATHER SIGNALS OF THE U. S. SIGNAL SERVICE.

WIND SIGNALS.†

THE DAY SIGNALS now adopted by this service for announcing the approach and probable force of wind storms at display stations along the Atlantic and Gulf coasts, and on the Great Lakes, are of two kinds, viz:

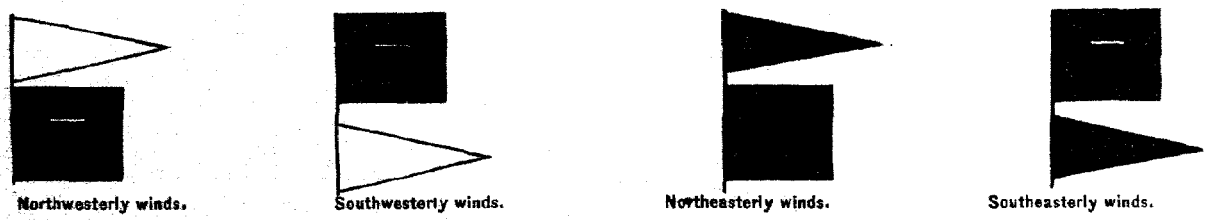
1st. *A Cautionary signal*, a yellow flag with a white center, which indicates that the winds expected are not so severe but well-found and seaworthy vessels can meet them without great danger.

2d. *A Storm signal*, a red flag with a black center, which indicates that the storm is expected to be of more marked violence, and dangerous to all classes of vessels.

In order to afford the public as exact information as possible regarding the relative position of the storm and the winds expected, two pennants are used. The red pennant indicates that the winds are to be easterly, that is, from northeast to *south*, inclusive, and that the storm center is approaching. The white pennant indicates westerly winds, that is, from *north* to southwest, inclusive, and that the storm center has passed. While the pennants indicate positively only whether the winds will be easterly or westerly, yet, in order to give still more definite information, the red or easterly pennant is displayed above the cautionary or storm signal for winds from the northeast quadrant and below for winds from the southeast quadrant. In like manner, the white pennant, while indicating westerly winds alone, will show by its position above the cautionary or storm signal that northwesterly winds are probable, or by being below that they will be from the southwest quadrant.

THE NIGHT SIGNALS indicate the wind direction only; a red light for easterly winds, and a red and white light for westerly winds.

STORM SIGNALS.



Northwesterly winds. Southwesterly winds. Northeasterly winds. Southeasterly winds.

THE **Cautionary signals** are the same as the above, except that a yellow flag with a white center takes the place of the red flag with black center.

† The wind signals here described are those adopted for use from September 1, 1887, to be displayed along the Atlantic and Gulf coasts, and on the Great Lakes, as storm conditions may demand.

This system of signals is devised with a view to distinguish between light and severe storms, and with the intention of showing whether the storm center has reached or passed the display station, as well as the probable direction from which severe winds are expected.

The system also takes into consideration the fact that westerly winds of high velocity with clearing weather are less dangerous than those from easterly quarters with freezing weather.

INFORMATION SIGNAL.

A yellow pennant indicates that the local observer has information regarding a storm of limited area, but dangerous for vessels about to sail for certain points; this information will be furnished upon application.

WEATHER, TEMPERATURE, AND COLD-WAVE SIGNALS.

[Adopted by the Signal Service for general use on and after March 1, 1887.]

Number 1, white flag, indicates clear or fair weather. Number 2, blue flag, indicates rain or snow. Number 3, black, triangular flag, always refers to temperature. When placed above numbers 1 or 2 it indicates warmer weather; when placed below numbers 1 or 2 it indicates colder weather; when not displayed, the indications are that the temperature will remain stationary, or that the change in temperature will not vary five degrees from the temperature of the same hour of the preceding day. Number 4, white flag, with black square in center, indicates the approach of a sudden and decided fall in temperature. The weather forecasts indicated by the flags are issued for the twenty-four hours commencing at 7 A. M. each day.

When displayed on poles the signals should be arranged to read downward; when displayed from horizontal supports a small streamer should be attached to indicate the point from which the signals are to be read.

INTERPRETATION OF DISPLAYS.

NOTE.—The wind signals are shown at certain points on the coast, as indicated in the list of stations given in another part of this volume.

The weather signals are shown more generally, being displayed in almost every town of importance.

APPENDIX IV.

REGULATIONS U. S. MARINE-HOSPITAL SERVICE.†

APPROVED MAY 20, 1889.

(EXTRACTS.)

GENERAL DUTIES OF MEDICAL OFFICERS.

84. The duties of officers of the medical corps are professional, sanitary, and executive. General duties.

85. The professional duties of a medical officer are to examine all applicants for relief, to prescribe and furnish medicine or hospital treatment as may be required, and to make physical examinations of seamen of the several Government services and merchant marine, under such regulations as shall hereinafter appear. Professional duties.

PROFESSIONAL DUTIES.

88. Medical officers will, upon the application of any United States shipping commissioner, or the master or owner of any United States vessel engaged in the foreign trade, or of any passenger steamer engaged in the coasting 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 accordance with existing regulations governing the physical examination of American seamen, any foreign seamen sent them for that purpose by the duly authorized agent of a foreign line or the consul representing the nation to which the vessel belongs. A fee of fifty cents will be charged for such examinations of foreign seamen, * * * * *. Medical officers will also, upon the application of the proper officers, examine enlisted men and persons desiring to enlist in the Revenue-Marine, 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. To examine applicants for relief, and certain other persons as to physical qualifications for enlistment in Government service.

89. Medical inspections of seamen, with reference to their fitness for service, will be made only at the respective marine-hospital offices, except at certain stations * * * * * in special cases. Examinations to be made at offices.

90. No fee will be charged by any medical officer of the Marine-Hospital Service for the medical inspection of any American seaman or for making a certificate as to his physical condition. No fee to be charged.

91. When requested by the local inspectors of steam vessels or other proper officers, medical officers and acting assistant surgeons will examine applicants for pilots' license as to acuteness of hearing, color-blindness, and general visual capacity, and will give a certificate accordingly. Color blindness and visual tests.

SANITARY DUTIES.

95. Upon the outbreak of epidemic smallpox at or near a relief station, medical officers and acting assistant surgeons will vaccinate such seamen as may come to the marine-hospital office for the purpose; and officers are authorized, at all times, to visit vessels to examine and vaccinate crews. * * * * * To vaccinate seamen.

RELIEF STATIONS.

133. 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 customs or Marine-Hospital Service is on duty. Definition.

134. All relief stations, where the service is under the charge of a medical officer of the Marine-Hospital Service shall be known as relief stations of Class 1. Relief stations where specific arrangements have been made for the care and treatment of sick or disabled seamen at rates fixed by the Treasury Department, but where collectors of customs, on account of the absence of a medical officer of the service, are authorized and required to issue permits and to supervise the relief furnished, shall be known as relief stations of Class 2. All other ports where there are officers of the customs revenue, but where, on account of the infrequency of application for relief, the absence of any hospital, or from other causes, sick or disabled seamen are cared for only in cases of emergency, shall be known as relief stations of Class 3. Classes.

† The Marine-Hospital Service is the medical department for the mercantile marine of the United States. It was established in 1798, and is charged with preserving the health interests of the officers and seamen employed on American vessels engaged in the foreign, coastwise, and inland commerce.

Districts.

135. 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.

North Atlantic.†

136. The District of the North Atlantic embraces the following-named relief stations, viz: Bangor, Me.; * * Bath, Me.; * * Belfast, Me.; * * Castine, Me.; Eastport, Me.; * * Ellsworth, Me.; * * Gloucester, Mass.; * * Machias, Me.; * * Portland, Me.; * * Portsmouth, N. H.; * * Rockland, Me.; * * Waldoboro, Me.; Wiscasset, Me.; together with all other relief stations situated in the same customs districts.

Location of offices and dispensaries.

147. The marine-hospital dispensary shall be located at the custom-house whenever practicable, and suitable office room for that purpose will be set apart, * * * * * subject to the approval of the Secretary of the Treasury.

BENEFICIARIES OF THE SERVICE, AND THE MANNER IN WHICH RELIEF IS EXTENDED TO THEM.

List of persons entitled to relief.

149. The persons entitled to the benefits of the Marine-Hospital Service are those employed on board in the care, preservation, or navigation of any vessel of the United States, or in the service, on board, of those engaged in such care, preservation, or navigation, excepting persons employed in or connected with the navigation, management, or use of canal-boats engaged in the coasting trade.

Wrecked seamen entitled.

150. Seamen taken from wrecked vessels under the United States flag, if sick or disabled, are entitled to the benefits of the Marine-Hospital Service and will be furnished care and treatment without reference to the length of time for which they have been employed.

Seamen sent by consular officers entitled.

151. Destitute American seamen 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.

Seamen must make application for relief.

152. A sick or disabled seaman, in order to obtain the benefits of the Marine-Hospital Service, must apply to a medical officer of that service, or, in the absence of such officer, then to the proper customs officer, * * * * * and must furnish satisfactory evidence that he is entitled to relief under the regulations.

Evidence to be presented by applicant. Form 1914.

153. Masters' certificates and discharge papers from United States shipping commissioners, properly made out and signed, showing that the applicant has been employed on a documented vessel or vessels of the United States for at least sixty days immediately preceding his application for relief, shall, in general, be held to constitute the "satisfactory evidence" required.

Certificates from owners or agents as evidence.

154. The certificate of the owner or accredited commercial agent of a vessel as to the facts of the employment of any seaman on said vessel may be accepted as evidence in lieu of the master's certificate in cases where the latter is not procurable.

Masters enjoined to furnish certificate of service.

155. Masters of 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 date of his last employment and the date of his discharge. This certificate will be filed in the marine-hospital office, or office of the customs officer, upon application being made for relief, whether the relief is furnished or the claim rejected.

Masters refusing to give certificate.

156. In case the master of any vessel shall fail or refuse to furnish a master's certificate to any seaman that may have been employed on board said vessel within thirty days preceding the seaman's application for relief, 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. Any master of a vessel who shall furnish a false certificate of service, with the intent to procure the admission of a seaman into any marine-hospital, shall be immediately reported to the nearest U. S. Attorney for prosecution.

Seamen to sign certificate.

157. 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.

Requirements as to service.

158. During the season when navigation is open at any port, seamen at that port are not entitled to relief from the Marine-Hospital Service, who, from any cause other than disease or injury, have not, within the sixty days immediately preceding the application for relief, been employed on any American vessel.

† Treasury Department Circular, June 20, 1890.

159. When an interval has occurred in the applicant's seafaring service by reason of the closure of navigation, such interval shall not be considered as excluding him from relief, except the sickness or injury for which he applies for relief be the direct result of employment on shore, nor shall the phrase "immediately preceding the application" be held as excluding from relief a seaman who has been but a few days away from his vessel, provided he has not abandoned his vocation as seaman; nor as excluding a seaman who may have been not exceeding two months away from his vessel, provided it be satisfactorily shown that such absence was due to sickness. Exceptions.

160. During the season when navigation is closed at any port, seamen at that port are not entitled to relief from the Marine-Hospital Service, who, from any cause other than disease or injury, have not been employed on board an American vessel within a period exceeding thirty days prior to the closure of navigation. Closure of navigation.

161. A seaman who has abandoned his vocation for any employment on shore for a period of two months or more, unless debarred from shipping by reason of sickness, disability, or closure of navigation, has thereby forfeited his claim to the benefits of the Marine-Hospital Service. Forfeiture of claims for abandoning vocation.

162. 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 a master's 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 may be accepted as evidence in support of his claim for the benefits of the Marine-Hospital Service. The applicant's affidavit may also be accepted as evidence in cases where the period of his last service, as shown by his papers, is less than sixty days. Affidavits may be accepted as evidence.

163. When the period of the seaman's service on last vessel is less than two months, his statement as to previous service may be accepted if supported by satisfactory evidence. Brief service on last vessel not a bar to relief.

169. The expenses of caring for sick and disabled seamen incurred during a voyage will not be paid from the marine-hospital fund. Expenses for sickness during voyage.

170. No relief will be furnished at the expense of the marine-hospital fund, except upon the certificate and recommendation of a medical officer of the Marine-Hospital Service, or of a competent physician, showing that the applicant requires medical treatment. Relief only upon certificate of officers.

171. In no case will money be paid to a seaman himself, or to his family or friends, out of the marine-hospital fund, as reimbursement for expenses incurred during sickness or disability. Money not to be paid to seamen for expenses of sickness.

172. The expenses for the care and treatment of seamen 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. Seamen admitted to quarantine hospitals.

DISPENSARY RELIEF.

173. 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 medicine, or dressing, or advice, without admission to hospital, will be treated as out-patients, and furnished medicines, dressings, surgical appliances, or advice, as the case may require. Cases to be treated at dispensary as out-patients.

174. Seamen will not be furnished relief at their own homes, except by special authority from the Supervising Surgeon-General of the Marine-Hospital Service, and then an allowance for medical attendance and medicines only will be made at rates fixed by the Treasury Department. No relief furnished at homes of patients.

STATIONS OF THE THIRD CLASS.

177. Whenever, at a third-class relief station, an application for relief is presented, the customs officers for the port are authorized and directed to cause out-door or office relief (medicines, surgical appliances, etc.) to be furnished in accordance with paragraph 173, or to furnish transportation to a relief station of the first or second class, as the case may be. But when the amount of the appropriation is insufficient, any relief station of the third class may be discontinued. Provisions for relief.

178. Whenever, in the opinion of the examining physician, the patient is unable to bear transportation without prejudice to his recovery, the facts will be at once reported to the Supervising Surgeon-General for instructions, and in case medical or surgical attendance is necessary, the customs officer will, pending action upon the case, provide it, if possible, at reasonable and just rates. The customs officer will in such cases employ a competent physician to take professional charge of the patient, and will arrange for suitable quarters, nursing, and diet for the patient, and the arrangements made by him will be reported, together with the rates of charges therefor. Temporary arrangements to be made.

Foreign seamen *et al.* not treated.

181. Foreign seamen, or employés of the various Government services, will not be treated at stations of the third class.

HOSPITAL RELIEF.

Cases for hospital treatment.

184. 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 a medical officer or acting assistant surgeon of the service, or of a reputable physician designated by the Department to act at a place where no medical officer is stationed.

STATIONS OF THE FIRST CLASS.

Bed tickets to be issued. Form 1917.

185. At relief stations where United States marine hospitals are located, the bed ticket will be prepared at the marine-hospital office, and given to the patient, and the patient will be admitted on presentation of said bed ticket inclosed in a sealed envelope.

To be valid only for day of issue.

186. The bed ticket, * * * * * unless presented on the day it is issued, * * * * * will be forfeited.

STATIONS OF THE SECOND CLASS.

Permits for hospital relief. Form 1916.

194. Customs officers or acting assistant surgeons will issue 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. * * * * *

Permits valid only on day of issue.

196. The hospital permit, before being delivered to the applicant for relief, must be inclosed in an envelope, sealed, and addressed to the medical 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 permit will be forfeited.

Applications for relief after office hours.

197. When, at a second-class station, a seaman entitled to the benefits of the service makes application for admission to hospital after the custom-house or dispensary is closed for the day, the surgeon in charge of the hospital in which the patients of the Marine-Hospital Service are treated may receive the patient, should the case be urgent. * * * * *

Relief not to be given on antedated permits.

199. Sick and disabled seamen presenting themselves at any hospital where patients of the Marine-Hospital Service are cared for, with hospital permits dated prior to the day when presented, will not be treated at the expense of the marine-hospital fund, except under such provisions as are prescribed by these regulations.

Relief not to exceed sixty days.

200. Continuous relief for periods exceeding sixty days will in no case be granted, except by special authority from the Department.

STATIONS OF THE THIRD CLASS.

Emergency cases only treated in hospital.

207. Hospital relief at stations of the third class will not be furnished except in cases of emergency and for a temporary period, under the special provisions of paragraph 178 of these Regulations.

INSANE SEAMEN.

Relief for insane seamen. March 3, 1875, s. 5.

212. Insane seamen entitled to the benefits of the Marine-Hospital Service may be admitted to the Government Hospital for the Insane upon the order of the Secretary of the Treasury, and the officers in charge of relief stations will report to the Supervising Surgeon-General any application for admission to hospital made in behalf of such seamen, and any cases of insanity that may occur among them, * * * * *

DECEASED SEAMEN.

Relatives to be notified.

213. 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. * * * * *

Burial expenses.

216. 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 fund unless said seaman was at the time of his death a patient of the service.

FOREIGN SEAMEN AND EMPLOYÉS OF GOVERNMENT SERVICES.

Foreign seamen may be treated.

217. The accommodations provided for the care and treatment of the patients of the Marine-Hospital Service are also available to foreign seamen only at relief stations where medical officers or acting assistant surgeons are on duty, upon the application of the consular officers of their respective nationalities, or upon the application of the masters of the vessels upon which said seamen serve, provided satisfactory security is given for the payment of the expenses of such care and treatment, * * * * *

218. Seamen employed on vessels of the Navy, or 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, * * * * *. Officers and seamen of the Revenue Cutter Service will be admitted to care and treatment at all stations of the first-class, without reference to length of service, and without charge.

Seamen of various Government services may be admitted.

221. Customs officers acting as agents of the Marine-Hospital Service will collect all bills for the care and treatment of foreign seamen by the Marine-Hospital Service. * * * * *

* * * accounts * * * * *.

TONNAGE DUES.

304. Customs officers will collect from vessels arriving in the United States from any foreign port of North America north of the southern terminus of the Isthmus of Darien, or any port in Newfoundland, the West Indian, Bahama, Bermuda, or Sandwich Islands, a duty of three cents per ton on every entry; but the total tax in any one year on entries from the ports specified is not to exceed fifteen cents. The tax to be collected on vessels making entry on arrival from other foreign ports is six cents per ton on every entry; but the total tax collected at six cents per ton is not to exceed thirty cents per ton in any one year.

Rates for assessment. U. S. Stat., c. 121, 1884. Act June 26.

305. Any vessel making such voyages as to become liable in any one year under both rates—that is, at three cents per ton and six cents per ton—shall not be held liable to an aggregate tax of more than thirty cents per ton for any one year, reckoned from the date of the entry and payment of her first tax at either rate; but the three-cent tax per ton shall not be collected on more than five entries in any one year.

Number of times tax may be assessed.

306. For half a ton or more than half a ton of the measurement of a vessel, collection will be made at the full rates of three or six cents per ton; for less than half a ton, no collection will be made.

Small craft exempt.

307. As provided by the Act of June 26, 1884, "that the President of the United States shall suspend the collection of so much of the duty herein imposed on vessels entered from any port in the Dominion of Canada, Newfoundland, the Bahama Islands, the Bermuda Islands, the West India Islands, Mexico, and Central America, down to and including Aspinwall and Panama, as may be in excess of the tonnage and light-house dues, or other equivalent tax or taxes, imposed on American vessels by the government of the foreign country in which such port is situated, and shall upon the passage of this act, and from time to time thereafter as often as it may become necessary by reason of changes in the laws of the foreign countries above mentioned, indicate by proclamation the ports to which such suspension shall apply, and the rate or rates of tonnage duty, if any, to be collected under such suspension," but customs officers will take no action by way of suspension of collection of tax till they have been informed that such suspension has been authorized by a proclamation of the President.

Dues suspended reciprocally.

MISCELLANEOUS.

309. No medical officer shall receive, have charge of, or pay any money on account of the Marine-Hospital Service, except the money belonging to patients of the service, as prescribed in these regulations.

Officers not to pay money.

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